POSTER PRESENTATIONS

P-001  EFFECTIVENESS OF SPUTUM CYTOLOGY FOR EVALUATION OF LUNG CANCER

OBJECTIVE: Sputum cytology is a noninvasive and cost-effective test for evaluation of lung cancer. But, because sputum contains large amount of mucus and blood, its false negative rate is relatively higher than with other invasive tests. ThinPrep (TP) technology, which has been widely used in gynecologic specimens, is a semiautomated cytopreparatory method with a mucolytic and hemolyzing effect. This study is to evaluate the effectiveness of the TP method in sputum cytology.

MATERIALS AND METHODS: We compared 1095 sputum specimens prepared by both TP and conventional smear (CS). Each case was evaluated for cellularity, morphologic details and obscuring background materials. Cytopathologic diagnoses were classified as unsatisfactory, normal, benign, borderline, suspicious and malignancy. For 357 cases in which biopsy was performed, each case was correlated with the tissue diagnosis.

RESULTS: TP and CS demonstrated similar cellularity in the majority of the cases. In TP slides, nuclear chromatin and nuclear cytoplasmic ratio were more preserved, while blood, mucus and inflammatory cells were more eliminated than CS. The cellular arrangement of TP was preserved but less distinct than that of CS. The cytologic rates of TP were 0.5% of unsatisfactory, 81.0% of normal, 6.2% of benign, 1.0% of borderline, 4.3% of suspicious and 7.0% of malignancy. The rates of CS were 7.9% of unsatisfactory, 82.7% of normal, 3.6% of benign, 0.5% of borderline, 3.0% of suspicious and 2.3% of malignancy. All malignancies diagnosed by CP were also seen on the TP slides. False negative rates, relative to histologic data, were 58.4% (TP) and 80.0% (CS). The cytologic detection rates of TP were 42.8% for squamous cell carcinoma, 43.2% of adenocarcinoma and 33.3% of small cell carcinoma.

CONCLUSION: By reducing unsatisfactory and false negative rates, sputum cytology using the TP method can be an effective test for evaluation of lung cancer.

From the Departments of Pathology and Internal Medicine, Chonnam National University Hospital, Republic of Korea.

P-002  ANALYSIS OF BRONCHIAL WASHINGS USING AUTOMATED QUANTITATIVE CYTOLOGY SYSTEM
M. Tercelj, M. Jerse, J. Matisic, G. Ross and A. Doudkine

The goal of this study was to evaluate an automated quantitative cytology system (ClearCyte Inc., Vancouver, Canada) for analysis of bronchial washings of patients suspected for lung cancer. We collected samples from 343 patients who were at high risk for lung cancer and therefore underwent diagnostic bronchoscopy procedure. Bronchial washing samples were taken during bronchoscopy, placed into collection jars with fixative and then processed and deposited on microscope slides using Cytospin 4 centrifuge (Thermo-Shandon, Pittsburgh, Pennsylvania, U.S.A.). Three slides from each sample were stained with hematoxylin-eosin and underwent conventional cytology assessment. At least 1 slide from each sample was stained with the Perceptronix’s Feulgen-Thionin staining protocol and analyzed using ClearCyte system. The system (fully automated image cytometer) scanned the slides and displayed images of cells with aneuploid DNA content on the computer monitor for visual review. Cytopathologist subsequently cleaned suspicious cell galleries of the remaining debris and reviewed diagnostic cells directly under the ClearCyte microscope. Our preliminary results, obtained on subset of 213 patients (55 with confirmed lung cancer, 158 with negative for cancer final diagnosis) produced sensitivity of conventional cytology of 63.8% at 100% specificity. The average sensitivity of quantitative cytology on the same samples was 74.1% at specificity of 96.1%. For peripheral lesions, sensitivity of quantitative cytology analysis was 66.7% vs. 33.3% for conventional cytology. Moreover, we observed 5 patients for which all the traditional diagnostic procedures using samples obtained during bronchoscopy (histopathology of forceps biopsy, cytology of washings and sputum) returned as “malignancy not found,” and quantitative cytology analysis produced positive for cancer results. Upon follow-up all 5 patients were diagnosed with cancer either by more invasive diagnostic procedure (fine needle aspiration) or finally by open biopsy. Results of the analysis on the complete set of patients will be presented at the conference.

From the Department of Respiratory Diseases, University Medical Centre, and Institute of Pathology, Medical Faculty, University of Ljubljana, Ljubljana, Slovenia; and Perceptronix Medical Inc., Vancouver, British Columbia, Canada.

P-003  SPLIT SAMPLE COMPARISON OF SUREPATH AND CONVENTIONAL SMEARS IN THYROID FINE NEEDLE ASPIRATIONS
Lee Kyo Young, Jung Chan Kwon, Lee Ah Won, Jung Eun Sun and Choi Yeong Jin

Although thyroid fine needle aspiration (FNA) is widely accepted as the primary diagnostic procedure for thyroid nodules, very few articles have been published on liquid-based techniques. The aim of this study was to investigate the efficacy of the SurePath liquid-based preparation. A total of 193 FNA cases with thyroid nodule were studied. Samples from sonography-guided FNA were split to prepare conventional smears and SurePath slides. The diagnostic categories of unsatisfactory, benign, atypical and malignant were compared. Immunocytochemistry was performed on SurePath slides by using monoclonal antibody against galectin-3. The SurePath method yielded unsatisfactory, 10 cases; benign, 134 cases; atypical, 12 cases; and malignant 37 cases. In contrast, conventional smears yielded unsatisfactory, 12 cases; benign, 139 cases; atypical, 12 cases; and malignant 30 cases. Histologic follow-up was available in 31 cases (nodular hyperplasia, 2 cases; follicular adenoma, 3 cases; papillary carcinoma, 26 cases). On analysis of the histologically confirmed cases, the SurePath method showed a trend toward a lower proportion of atypical category. With the SurePath method, nuclear detail and nucleioli were more easily detected and also useful for the diagnosis of malignancy. Of 26 papillary carcinomas, 21 (81%) showed positive staining of galectin-3. The SurePath method showed easier and less time-consuming evaluation of cytomorphicic features and appeared to be more useful in diagnosing the suspicious cases. Moreover, it offered the possibility of adjunctive immunocytochemistry on the same sample.

From the Department of Hospital Pathology, College of Medicine, The Catholic University of Korea, Seoul, Korea.
P-006 CYTOLOGIC ATYPIA AND HER-2/neu EXPRESSION IN BREAST DUCTAL LAVAGE

M. Miller, C. Lupu, C. Scacchi, M. Cazzaniga, L. Chiapparini and C. Casadio

OBJECTIVE: Her-2/neu when overexpressed in breast carcinoma is associated with poor prognosis, aggressive disease and resistance to certain chemotherapeutic agents. Evaluation of Her-2/neu status can aid in clinical management of the patient. The presence of cytologic atypia can be evaluated in ductal lavage (DL) fluid, and further analysis of Her-2/neu status can be performed.

MATERIALS AND METHODS: DL was performed on 33 patients without evidence of clinical or radiologic suspicious findings, including 27 women at high risk for developing breast cancer having either an increased Gail index (4 women), contralateral breast cancer (11 women) or the probability or confirmation of BRCA-1/2 mutation (8 women) and 6 control patients at average risk. From these women, 31 DL samples diagnosed as atypical were selected for further analysis by immunohistochemistry for Her-2/neu expression.

RESULTS: Fifty-one DLs were diagnosed as atypical: 42 atypical, not suspicious for malignancy (C3) and 9 atypical, suspicious for malignancy (C4). Lack of Her-2/neu immunoreactivity (0) was seen in 36 cases (31 C3, 5 C4). A faint or barely detected membrane staining in > 10% of the cells with incomplete membrane staining (1+) was seen in 10 cases. A weak to moderate complete membrane staining present in > 10% of the cells (2+) was seen in 4 cases. One case was borderline between a score of 1+ and 2+. Results are summarized in Table I.

CONCLUSION: Cytologic atypia can be detected in DL and can be utilized for monitoring women at high risk for developing breast cancer. In this study the presence of Her-2/neu expression does not correlate with the morphologic degree of cytologic atypia. In the absence of subsequent pathology it is not possible to relate Her-2/neu expression with the presence of cytologic atypia.

Table I  Her-2/neu Expression in Ductal Lavage Cases Diagnosed as Atypical

<table>
<thead>
<tr>
<th>Her-2/neu</th>
<th>0</th>
<th>1+</th>
<th>2+</th>
<th>1+2+</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3</td>
<td>31</td>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>C4</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

C3 = atypical, not suspicious for malignancy, C4 = atypical, suspicious for malignancy.

From the European Institute of Oncology, Milan, Italy.
P-007  CRITERIA FOR IMPROVING DIAGNOSTIC ACCURACY IN CYTOLOGICALLY SUSPICIOUS CASES OF BREAST CARCINOMA IN YOUNG WOMEN


OBJECTIVE: Breast cancer in young women (younger than 35 years) is not common and accounts for about 5% of all breast cancer cases in Taiwan. Because of the low prevalence of breast carcinoma in this age-group, significant delays in diagnosis may occur. To improve the diagnostic accuracy, we evaluated the efficacy of various cytologic grading criteria in suspicious breast aspiration cytology specimens from young women.

MATERIALS AND METHODS: We retrospectively surveyed the cytology profiles at our hospital between 1996 and 2005 and obtained 52 cases with diagnosis as “suspicious of breast carcinoma.” Eight cases were lost to follow-up without final diagnosis, and were excluded from statistical analysis. One experienced reviewer was blinded to histologic findings and graded score 1–3 for all specimens by using 7 cytologic features, including dissociation, cell uniformity, cell size, nuclear margin, chromatin pattern, nucleoli and the presence of myoepithelial cells.

RESULTS: Of 44 patients evaluated, ductal carcinoma was diagnosed by histology in 14 (32%). Cytologic criteria significantly associated with malignancy were dissociation (p = 0.001), cell uniformity (p = 0.01), cell size (p = 0.009), nucleoli (p = 0.001) and myoepithelial cell presence (p = 0.002). By ROC curve analysis, area under curve was larger when adding myoepithelial cell criteria (0.938 vs. 0.930). Using 7 criteria, grading score ≥12 provided the best sensitivity (87.5%), specificity (93.3%) and accuracy (84.1%). On omitting specimens containing >40% degenerated cells, 28 patients were reanalyzed. Grading score ≥13 would yield the best sensitivity (87.5%), specificity (100%) and accuracy (96.4%).

CONCLUSION: This study demonstrated a good correlation between cytologic features and histologic diagnosis of carcinoma. By using appropriate cytologic grading criteria, the suspicious categorization can be reduced without further invasive procedure in this young age-group of breast tumors.

From the National Taiwan University Hospital, Taipei, Taiwan, Republic of China.

P-009  FINE NEEDLE ASPIRATION CYTOLOGY OF INVASIVE MICROPAPILLARY CARCINOMA OF THE BREAST

Hyun Joo Choi, Jung Ha Shin, Ji Han Jung, Kiouk Min, Jinyoung Yoo, Seok Jin Kang and Kyo Young Lee

Invasive micropapillary carcinoma (IMPC) of the breast is a recently described rare variant of invasive ductal carcinoma. This variant has a distinctive histologic feature and aggressive biologic behavior. We reviewed the cytologic features of 8 cases of IMPC and evaluated for cellularity, background, arrangement of tumor cells including angulated papillary configuration, morular pattern, single cells, fibrovascular core and inside-out pattern, microcalcification and tumor cell architecture including nuclear grade, nuclear overlapping, and nucleoli. The cytologic smears showed moderate to high cellularity and were composed of atypical, angulated, cohesive clusters of neoplastic cells with papillary to tubuloalveolar architecture like the morular growth pattern seen on histopathology, without fibrovascular cores. Seven patients had axillary lymph node metastases. IMPC of the breast has distinctive cytologic features and is important for early diagnosis by fine needle aspiration cytology due to its aggressive behavior.

From the Department of Hospital Pathology, College of Medicine, The Catholic University of Korea, Seoul, Korea.

P-010  FINE NEEDLE ASPIRATION CYTOLOGIC FINDINGS OF INVASIVE MICROPAPILLARY CARCINOMA OF THE BREAST

S.-Y. Jin, D. W. Lee, D. W. Kim, M. S. Choi and S. M. Park

Invasive micropapillary carcinoma is a rare variant of invasive ductal carcinoma of the breast. This variant is associated with a set of peculiar cytologic findings that consists of small, oval to angulated papillary clusters of uniform cells. In most reported cases, the biologic behavior is aggressive and massive axillary lymph node metastases are present at the time of diagnosis. The differential diagnosis from FNAC findings are papillary carcinoma and infiltrating ductal carcinoma. Papillary carcinoma shows true fibrovascular core and large-sized papillary clusters. Infiltrating ductal carcinoma shows high pleomorphism, high nucleus cytoplasm ratio with macronucleoli, necrotic but less hemorrhagic background and a high proportion of scattered single tumor cells. We experienced 5 cases of fine needle aspiration cytology (FNAC) of invasive micropapillary carcinoma of the breast. Average age was 45.8 years (range 38–52 years). The average tumor size was 2.3 cm (range 1–5 cm). All of them complained of an incident unilateral breast mass for a few months. One patient revealed 2 separate masses on ultrasonography. FNAC findings were a highly cellular smear of malignant epithelial cells arranged in small, oval to angulated papillary clusters, but which lacked true central fibrovascular cores. The background was necrotic and hemorrhagic. The nuclei were small, centrally located, with inconspicuous nucleoli. The histologic findings of 3 cases were pure form and the other 2 cases were mixed forms of invasive micropapillary carcinoma with invasive ductal carcinoma and a ductal carcinoma in situ component. They composed of cohesive malignant epithelial cells, surrounded by distinctive clear spaces and separated by fibrous septa. Axillary lymph node metastases were present in 4 patients at the time of diagnosis.

From Soonchunhyang University Hospital, Seoul, Korea.

P-011  FINE NEEDLE ASPIRATION CYTOLOGIC FINDINGS OF SOLID PAPILLARY CARCINOMA OF THE BREAST

D. W. Lee, S.-Y. Jin, D. W. Kim, M. S. Choi and S. M. Park

Solid papillary carcinoma of the breast is a distinctive form of intraductal papillary carcinoma. It frequently shows neuroendocrine differentiation and is associated with both mucinous carcinoma and infiltrating ductal carcinoma, not otherwise specified. The clinical course is slow and indolent. The cytologic findings showed highly cellular smear of distinct tight clusters or discohesive scattered single cells on hemorrhagic and mucinous background. The nuclei...
were centrally located, monotonously round to oval in shape with low-grade atypia. The cytoplasm is abundant and finely granular. The differential diagnosis from FNAC findings are papillary carcinoma, mucinous carcinoma and infiltrating ductal carcinoma. We experienced 3 cases of solid papillary carcinoma of the breast diagnosed by fine needle aspiration cytology (FNAC). Average age was 40.6 years (22–56 years). Average tumor size was 2.2 cm (1.4–3.1 cm). All of them complained of incidental unilateral breast mass for a few months. FNAC findings showed high cellularity consisting of distinct tight clusters of tumor cells with discohesive scattered tumor cells on hemorrhagic background. The nuclei were monotonously round to oval in shape with inconspicuous nucleoli. The cytoplasm was abundant and finely granular. Many foamy macrophages were scattered in 1 case. All 3 cases showed scant amount of mucinous material on the background. The histologic findings of 2 cases were mixed forms of solid papillary carcinoma with invasive ductal carcinoma and mucinous carcinoma. They were composed of intraductal solid clusters of cohesive malignant epithelial cells, with perivascular pseudosorsette-like proliferation, and multiple foci of microinvasion. Immunohistochemistry for neuroendocrine markers showed no positive staining. For the remaining case, the tumor was a mixed form of solid papillary carcinoma with invasive ductal carcinoma. The differential diagnosis from FNAC findings are micropapillary or solid papillary carcinoma with ductal carcinoma in situ. Immunohistochemistry for neuroendocrine markers showed no positive staining.

CONCLUSION: The 3 cases of solid papillary carcinoma of the breast diagnosed by FNAC showed distinct histologic findings with cytopathologic findings. The evaluation of PgR shows a more divergent picture than ER, and minimal invasive procedure, we wanted to investigate whether a valid result could be obtained by immunostaining for estrogen receptor (ER) and progesterone receptor (PgR) on residual material from FNA.

MATERIALS AND METHODS: From October 2004 to August 2006 we received 151 aspirates, in which there were clinical indications for knowing receptor status preoperatively. Cellblocks were made of the residual material left in the syringe after preparing the smears. The aspirates were made from breast tumors ≥ 20 mm. Histologic follow-up was used as a gold standard. RESULTS: Of the 151 aspirates there was cytologic as well as histologic receptor status in 123 of them. Of the remaining 28 there is not (yet) histologic material from 5 patients. Twenty-three (15%) cellblocks were evaluated as unsatisfactory according to. According to the 123 patients with as well cytologic as histologic receptor diagnosis concordance for ER was achieved in 118 of these. Ninety-two were receptor positive, and 26 were diagnosed receptor negative.

CONCLUSION: With a full agreement in 96%, we conclude that a valid determination of ER status can be made on cytologic material. The evaluation of PgR shows a more divergent picture than ER, would be expected. As with all other FNAs, the result depends on experience with performing these.

From Vejle Hospital, Vejle, Denmark.

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**P-012 EVALUATION OF RECEPTOR STATUS ON RESIDUAL MATERIAL FROM FINE NEEDLE ASPIRATION IN PATIENTS WITH BREAST CANCER**

A. M. B. Jylling

OBJECTIVE: Sometimes it is useful to know the receptor status in patients with breast cancer at the time of diagnosis. Needle core biopsies can be used, but as fine needle aspiration (FNA) is an easy and minimal invasive procedure, we wanted to investigate whether a valid result could be obtained by immunostaining for estrogen receptor (ER) and progesterone receptor (PgR) on residual material from FNA.

MATERIALS AND METHODS: From October 2004 to August 2006 we received 151 aspirates, in which there were clinical indications for knowing receptor status preoperatively. Cellblocks were made of the residual material left in the syringe after preparing the smears. The aspirates were made from breast tumors ≥ 20 mm. Histologic follow-up was used as a gold standard.

RESULTS: Of the 151 aspirates there was cytologic as well as histologic receptor status in 123 of them. Of the remaining 28 there is not (yet) histologic material from 5 patients. Twenty-three (15%) cellblocks were evaluated as unsatisfactory according to. According to the 123 patients with as well cytologic as histologic receptor diagnosis concordance for ER was achieved in 118 of these. Ninety-two were receptor positive, and 26 were diagnosed receptor negative.

CONCLUSION: With a full agreement in 96%, we conclude that a valid determination of ER status can be made on cytologic material. The evaluation of PgR shows a more divergent picture than ER, would be expected. As with all other FNAs, the result depends on experience with performing these.

From Vejle Hospital, Vejle, Denmark.

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**P-013 CYTOPATHOLOGIC FINDINGS OF BREAST CARCINOMA WITH METAPLASIA, MATRIX PRODUCING CARCINOMA**

Z. Naito, S. Maeda, H. Katayama, Y. Fujiwara, M. Onda and S. Tuchiya

A 72-year-old woman presented with palpable and mobile lumps in the left breast. MMG showed a 3 × 2.3 cm breast tumor with an oval and multilobular pattern and popcorn-shaped calcifications. On ultrasound examination, the tumor showed an asymmetrical, solid mass with a cystic lesion in a center. Coarse calcification was also observed. After a fine needle aspiration procedure, the lump was surgically excised. This cytopathologic diagnosis was carcinoma with metaplasia, matrix producing carcinoma. In this paper, other cases of carcinoma with metaplasia will be also presented.

From Nippon Medical School, Tokyo, Japan.

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**P-014 PREDICTORS IN LOBULAR CARCINOMA OF THE BREAST: FOCUS ON STATIC DNA EVALUATION AND IMMUNOCYTOCHEMICAL MARKERS**

Jacinto Neto, Victor Arias, Neuza Shirata and Adhemar Filho

OBJECTIVE: Lobular invasive carcinoma is the second most frequent malignant tumor of the female breast. Its behavior and mechanisms of carcinogenesis are not fully understood. The absence of e-cadherin expression is believed to be a specific characteristic of these tumors, but in some instances it might be difficult to discriminate it from its ductal counterpart. The evaluation of the DNA ploidy is an important method in the study of breast carcinomas as long as the DNA content of those tumors might predict behavior and outcome. The goal of this study was to determine the importance of DNA content to prognosis of lobular invasive carcinoma and to correlate the DNA content results with immunohistochemical markers frequently used in breast cancer evaluation.

METHODS: Fifty-one cases of in e-cadherin–negative invasive lobular carcinoma were evaluated. The DNA ploidy content was assessed by a computer-assisted system. Immunoreactions were performed against e-cadherin, estrogen receptors, cathepsin D, p53 and c-erbB-2.

RESULTS: Of 41 cases, 39 (95.12%) were aneuploid. Moreover, there was strong correlation with immunoreexpression to estrogen receptor (70%) and cathepsin-D (100%). 95.65% and 60.86% of the cases were negative for p53 and c-erbB-2, respectively.

CONCLUSION: The findings of this study reveal that most of the invasive lobular carcinomas are cathepsin-D positive and aneuploid. It was also observed a significant correlation between the aneuploid carcinomas poor outcome in cases with negative expression of c-erbB-2 and p53 and positive reactivity for cathepsin-D. These features represent a powerful algorithm to identify lobular carcinomas and to predict outcome.

From FEJAL/CESMAC-ASCES-IAL, LIM26HC-FMUSP, and Adolfo Lutz Institute-IAL, Brazil; and University of Minho, Braga, Portugal.
P-015  UTILITY OF ASPIRATION BIOPSY CYTOLOGY FOR BREAST TUMOR < 1 cm
T. Notsu, Y. Matsui, Y. Ashida, M. Yoshida, M. Kanda and R. Mukakami

OBJECTIVE: Proving that aspiration biopsy cytology under ultrasonography is valuable clinically for the diagnosis of breast tumors < 1 cm.

MATERIALS AND METHODS: Sixty-two patients with breast disease were operated at Matsue Municipal Hospital from November 2004 to June 2006. Fifty-six breast carcinomas, 5 benign diseases and a borderline disease were recognized in these patients. We performed aspiration procedures to breast tumors under ultrasonography. Staining of the aspirated cells was performed by Papanicolaou, May-Grünwald-Giemsa. Cytologic diagnosis was performed with a pathologist, a surgical doctor and 2 clinical cytologists.

RESULTS: Eleven patients have breast cancers < 1 cm, consisting of 5 scirrhous carcinomas, 3 papillotubular carcinomas, an apocrine carcinoma, a solid tubular carcinoma, a ductal carcinoma in situ and an inflammatory carcinoma. Cytologic diagnosis was performed in 9 cases, and we made accurate diagnoses in 6 cases (66.6%), suspicious diagnoses in 2 cases (22.2%) and undetermined in 1 case.

CONCLUSION: Diagnosis of the breast carcinomas < 1 cm was difficult, but accuracy of aspiration biopsy cytology under a high-resolution ultrasonography was 88.8%; we concluded that cytology for small breast carcinomas is so reliable that we can use this method clinically.

From Matsue City Hospital, Matsue, Japan.

P-016  FINE-NEEDLE ASPIRATION CYTOLOGY OF BREAST CANCER WITH ENDOCRINE DIFFERENTIATION: A REPORT OF SOLID PAPILLARY CARCINOMA IN SITU
S. Sasou, G. Tamura, M. Uematsu and Y. Takahashi

BACKGROUND: We were able to examine the cytology of solid papillary carcinoma in situ of the breast, showing endocrine differentiation.

CASE: A 76-year-old woman presented with 2 painful lumps of the right breast. Ultrasonography scans showed 2 nodes that were in the inner site, 7 mm in size, and in the outer site, 10 mm in size, of the breast. Fine needle aspiration (FNA) cytology was performed on the lump. Subsequent mastectomy was performed. The FNA smears stained by the Papanicolaou method demonstrated an abundantly cellular aspirate comprising scattered cells and loosely held clusters of cells. Cells were large with bluish cytoplasm in May-Grünwald-Giemsa–stained smears and large, eccentrically placed nuclei. Cell morphology was not suggestive of any cancer native to breast. Cellblocks were prepared. The case was given a diagnosis of metastatic disease to the breast. Immunohistochemistry showed positivity for desmin and myoglobin. On review of history the patient had undergone resection of tumor mass from the ankle about a year previously. Review of the slides showed rhabdomyosarcoma. The final diagnosis given in this case is breast metastasis from alveolar rhabdomyosarcoma. A 58-year-old woman presented with large bilateral breast lumps of 3 months duration. Aspiration yielded ~ 15 mL of straw-colored fluid. Smears prepared from aspirate showed poorly cohesive sheets and singly dispersed cells. Cells were very large and pleomorphic, with large bizarre nuclei. Numerous mitotic figures were seen. Cell morphology again was not suggestive of a breast malignancy, though metastatic carcinoma was kept in mind. Cystic fluid suggested a lesion metastatic to breast. Cellblocks prepared from the fluid showed typical papillary configurations with classical features of malignancy. Further investigation revealed a cystic mass in liver and small cystic tumor in her right ovary. The case was reported as breast metastasis from ovarian papillary cyst adenocarcinoma. In conclusion, breast is an uncommon site for metastasis. Breast metastasis, although rare, must be recognized to avoid unnecessary radical surgery. Moreover, the presence of changes not native to breast should be recognized to look for primary sites.

From Base Hospital, Delhi, India.

P-017  UNUSUAL METASTASES TO BREAST
S. Satyanarayana

Metastasis to the breast from extramammary malignancies is rare, but its recognition is important. Here we report 2 case of metastasis to breast. A young girl presented with a well-defined small, non-tender firm lump of the breast of 2 months duration. Smears revealed cellular aspirate comprising scattered cells and loosely held clusters of cells. Cells were large with bluish cytoplasm in May-Grünwald-Giemsa–stained smears and large, eccentrically placed nuclei. Cell morphology was not suggestive of any cancer native to breast. Cellblocks were prepared. The case was given a diagnosis of metastatic disease to the breast. Immunohistochemistry showed positivity for desmin and myoglobin. Review of history the patient had undergone resection of tumor mass from the ankle about a year previously. Review of the slides showed rhabdomyosarcoma. The final diagnosis given in this case is breast metastasis from alveolar rhabdomyosarcoma.

P-018  CHARACTERISTIC CYTOLOGIC FEATURES OF HISTOLOGIC GRADE 1 BREAST CARCINOMAS IN FINE NEEDLE ASPIRATES
T. Sauer and M. Keramzadeh

OBJECTIVE: To analyze the spectrum of nuclear features as well as dissociation pattern found in fine needle aspiration cytology (FNAC) samples from histologic grade 1 breast carcinomas and evaluate the critical cytologic features of these lesions.
P-020 ROBINSON’S CYTLOGIC GRADING SYSTEM IN ESTIMATING HORMONE RECEPTORS, HER2/TOPOIIALPHA GENE AMPLIFICATION AND PATIENT PROGNOSIS IN DUCTAL CARCINOMA OF THE BREAST

Y. Enomoto, K. Taniyama, T. Toda, A. Mimoto, T. Nishimura, K. Kuraoka, S. Teramoto and M. Koseki

OBJECTIVE: In 1994 the cytologic grading system by Robinson et al (R-system) for fine needle aspiration cytology (FNAC) of ductal carcinoma of the female breast was well correlated with histologic atypism of carcinoma cells. In the present study, we investigate the relationship between the R-system and expression status of hormone receptor, molecular characteristics of the carcinoma cells or the patient’s prognosis.

MATERIALS AND METHODS: FNAC specimens for 192 ductal carcinomas of the female breast resected between 1993 and 1998 were classified by R-system retrospectively to investigate patient prognosis. Immunohistochemistry for hormone receptors and proteins of HER2, phosphorlated c-HER2 and TOPOIIalpha using formalin-fixed, paraffin-embedded specimens were performed in 195 ductal carcinomas of the female breast. They were resected between 2001 and 2004 and classified prospectively by the R-system. FISH for HER2/TOPOIIalpha gene amplification using fresh samples was also performed in the same cases. Relationships between the R-system and the protein expression, gene amplification and patient prognosis were analyzed statistically.

RESULTS: Among the 192 cases resected between 1993 and 1998, stage I, II and III were 74, 107 and 12 cases, respectively. Postoperative disease-free or cumulative survival rates of stage II cases were significantly correlated with the R-system. Among the 195 cases resected between 2001 and 2004, the R-system was inversely correlated with HER2/ c-HER2/TOPOIIalpha protein expression and HER2 gene amplification.

CONCLUSION: The R-system appears to be a very useful tool for breast cancer when selecting therapy.

From the Kure Medical Center and Chugoku Cancer Center, Hiroshima, Japan.

P-021 A 30-YEAR RETROSPECTIVE REVIEW OF MALE BREAST CANCER WITH EMPHASIS ON ROLE OF FINE NEEDLE ASPIRATION IN CANCER DETECTION

G. Verstovsek and D. Rosen

OBJECTIVE: To determine the frequency of breast carcinoma among male patients with breast masses seen at a single institution in a 30-year period and to assess the role of fine needle aspiration (FNA) in detecting male breast cancer.

METHODS: Computer patient records were searched from January 1976 to September 2006. Male patients who had a diagnosis of carcinoma on breast biopsy or resection were identified, and detailed chart review was done to assess demographics and correlate biopsy and FNA results.

RESULTS: A total of 147,898 patient charts were searched, and 175 male patients were found to have had a breast mass and subsequent biopsy or resection. Twenty two of 175 (13%) were positive for carcinoma (frequency 12.5%) and 153 (87%) were negative. Among the positive cases, 20 (91%) were primary breast carcinoma
and 2 (9%) were metastases. Negative cases included benign neoplasms (5; 3%), insufficient (2; 1%) and other (e.g., inflammatory, gynecomastia, benign breast tissue; 146; 96%). Eight of 22 (36%) positive cases had a breast mass or axillary mass FNA performed. Five of 8 FNAs were interpreted as positive for malignancy, 2 as atypical or indeterminate and 1 as negative. Subsequent excision confirmed carcinoma in all positive and atypical or indeterminate FNA cases and excluded malignancy in the negative case.

CONCLUSION: In our institution the great majority of male breast masses are benign and nonneoplastic. Male breast carcinoma is a rare disease with a frequency of 12.5%. Although most cases are diagnosed with a surgical biopsy, FNA is a highly accurate method in diagnosing male breast carcinoma and should be considered in the initial assessment of palpable breast masses in male patients.

From Baylor College of Medicine and Michael E. DeBakey VA Medical Center, Houston, Texas, U.S.A.

P-022 FINE NEEDLE ASPIRATION CYTOLOGY OF INVASIVE MICROPAPILLARY CARCINOMA OF THE BREAST

P. Lui, P. Lau, G. Tse, P. Tan, R. Lo, V. Tang, W. Ng, T. Chau, K. Mak and N. Chan

OBJECTIVE: To determine the pathognomonic diagnostic cytologic features of invasive micropapillary carcinoma of the breast, which is a poor prognosis subtype of infiltrating ductal carcinoma.

METHODS: A series of 20 histologically proven tumors were reviewed retrospectively to evaluate the various cytologic features, including tumor morules, isolated malignant cells, staghorn epithelial structures, mucinous background and apocrine metaplasia.

RESULTS: Tumor morules formation and isolated malignant cells were the most reliable and constant cytologic features, being present in 75% (15 of 20 cases) of cases. Staghorn epithelial structures were present in 35% (7 cases). Mucinous background (2 cases, 10%) and apocrine metaplasia (4 cases, 20%) of the tumor cells were seen in a few cases only and did not appear very helpful.

CONCLUSION: Tumor morules formation, isolated malignant cells and staghorn epithelial structures are the most reliable cytologic features, and the presence of these should raise the suspicion of invasive micropapillary carcinoma.

From the Department of Anatomical and Cellular Pathology, Prince of Wales Hospital, The Chinese University of Hong Kong; Department of Pathology, Kwong Tong East Hospital; Department of Pathology, Pamela Youde Nethersole Eastern Hospital; and Department of Pathology, St. Teresa Hospital, Hong Kong; and Department of Pathology, Singapore General Hospital, Singapore.

P-023 LOSS OF CELL COHESION IN BREAST CYTOLOGY

T. Wakasa, E. Taniguchi, T. Kagiya, O. Nunobiki, I. Mori, Y. Nakamura and K. Kakudo

OBJECTIVE: The loss of cellular cohesion with or without necrotic background is one of the most helpful criteria in breast cytology. We have reported that isolated epithelial cells may be observed in benign intraductal papilloma with infarction. In this study, we analyzed 37 cases of smears by fine needle aspiration (FNA) displaying numerous dissociated cells and correlate it with histologic findings.

MATERIALS AND METHODS: A total of 5,236 cases of FNA from breast were carried out in our laboratory from 1996 to 2005, and 1,583 cases underwent resection and histologic diagnoses were confirmed. Numerous dissociated cells were observed in 37 cases. Every histologic specimen was reviewed.

RESULTS: In 37 cases, there were 4 benign diseases and 33 malignant diseases. They were 3 intraductal papillomas, 1 adenomyoepithelioma, 1 lobular carcinoma, 2 ductal carcinomas in situ, 1 medullary carcinoma, and 29 other cases of invasive ductal carcinoma.

In the cytologic findings, we classified the cases into 3 patterns according to cell size and shape. (1) Cytologic examination showed numerous isolated spindle cells with necrotic background. We classified 4 cases in this group (3 intraductal papillomas and 1 adenomyoepithelioma). (2) Cytologic examination showed lymphocytes and rather large isolated cells like medullary carcinoma. We classified 4 cases in this group (1 medullary carcinoma, 3 invasive ductal carcinomas). (3) The cytology showed numerous uniform small round cells. We classified 29 cases in this group (1 lobular carcinoma, 2 ductal carcinomas in situ and 26 invasive ductal carcinomas).

CONCLUSION: Numerous isolated cells are sometimes seen in both benign and malignant cytology.

From Wakayama Medical University, Wakayama, Japan.

P-024 METASTATIC MERKEL CELL CARCINOMA IN A PLURAL EFFUSION: A CASE REPORT

P. Hyder, D. Rana, M. Yunch and M. Desai

BACKGROUND: Merkel cell carcinoma (MCC) is a rare, aggressive dermal tumor with a poor prognosis. It can be a difficult diagnosis to make, both histologically and cytologically given its morphologic similarity to other small round blue cell tumors.

OBJECTIVE: We describe a case of MCC metastatic to the pleura. To our knowledge only 2 cases have been reported previously.

MATERIALS AND METHODS: An 83-year-old man first presented with a lump on his right arm that was diagnosed as MCC on histology. He underwent excision but later developed recurrence in his right axilla, requiring axillary clearance and local radiotherapy. Almost 3 years after the initial presentation, he developed a large right pleural effusion, which was aspirated, along with extensive metastatic disease to the abdomen, adrenal gland and mediastinal nodes.

RESULTS: Cytologic examination of the pleural fluid confirmed metastatic MCC. The malignant cells had a high nucleus to cytoplasm ratio; finely granular, “dusty” chromatin; multiple small nucleoli; and scant, well-defined cytoplasm. They showed immunoreactivity with BerEP4, AE1/AE3, cytokeratin 20 and Cam 5.2, the latter 3 showing characteristic perinuclear dot-like positivity. Staining for CD5, calretinin and thyroid transcription factor-1 was negative.

CONCLUSION: MCC, despite being a rare entity, has serious implications, and accurate early diagnosis is crucial in order to provide the best benefit to the patient. The diagnostic cytologic features are akin to those seen in histology specimens. This disease must enter into the differential diagnosis of small round blue cell tumors, especially in the setting of an appropriate clinical history, and steps must be taken to distinguish it from the more commonly arising small cell carcinoma metastatic to the pleura, for which immunocytochemistry plays a useful role.

From Manchester Cytology Centre, Manchester, U.K.
RESULTS: the specimen.

The objective seems to be the gold standard for the patients with pulmonary cavity.

den reduce after the third dose of cisplatin, instilled into pericardial procedures, and prompt clinical improvement was observed. Cytologic examination of the presence of neoplastic cells in the pericardial fluid, cisplatin (10 mg in 20 mL normal saline) was instilled into the pericardial cavity for 3 consecutive days. After the second and third dose of intrapericardial cisplatin, cytologic examination was performed and the neoplastic burden was evaluated. Clinical and echocardiographic follow-up examinations were made on a monthly basis.

RESULTS: There were no serious complications from these procedures, and prompt clinical improvement was observed. Cytologic examination of pericardial fluid showed remarkable neoplastic burden reduce after the third dose of cisplatin, instilled into pericardial cavity.

CONCLUSION: The cytologic examination, apart from the detection of malignancy, gives important information for the response to treatment of patients with malignant pericardial effusion. The intrapericardial administration of cisplatin in combination with cytology seems to be the gold standard for the patients with pulmonary non–small cell cancer.

From the Departments of Cytopathology and Cardiology, Greece.

P-026  METASTATIC TRANSITIONAL CELL CARCINOMA CAUSING A UNILATERAL PLEURAL EFFUSION: AN INTERESTING AND CHALLENGING DIAGNOSIS IN EFFUSION CYTOLOGY

S. McGrath, D. Rana, M. Lynch and M. Desai

OBJECTIVE: We describe a case of metastatic transitional cell carcinoma in a pleural fluid sample taken from a patient with known transitional cell carcinoma of the urinary bladder. This is an unusual diagnostic challenge because this neoplasm is rarely associated with malignant effusions. We describe the cytologic features that may be of assistance in these patients.

MATERIALS AND METHODS: Two milliliters of pleural fluid were received from a 50-year-old man with a known history of poorly differentiated transitional cell carcinoma of the urinary bladder and an omental cake. Several preparations were generated from the specimen.

RESULTS: Cytologic examination of the pleural fluid revealed a large number of pleomorphic malignant cells with low to high nuclear to cytoplasmic ratios lying both singly and in groups. A notable finding was the high frequency of cytoplasmic vacuoles, many of which contained either eosinophilic or, less commonly, basophilic inclusions. These are referred to as Melamed-Wolinska bodies. These inclusions were best appreciated in the ThinPrep preparation. They were also clearly demonstrated in the fluid clot section. The malignant cells in the clot material were positive for cytokeratin 7, BerEP4 and 34 βE12, TTF1, cytokeratin 20 and calretinin were negative. In view of the combined morphologic and immunohistochemical findings, a diagnosis of metastatic transitional cell carcinoma was made. Following diagnosis the previous bladder and omental cake biopsies were reviewed. Similar inclusions were also seen in both of these specimens.

CONCLUSION: To our knowledge, eosinophilic cyttoplasmic inclusions have been noted previously in pleural effusion fluid obtained from patients with transitional cell carcinoma in only one previous study. The presence of such inclusions should always raise the possibility of this neoplasm before the effusion is deemed to be due to one of the more usual causes of a metastatic effusion.

From Manchester Cytology Centre, Manchester, U.K.

P-027  CYTOLeGIC FEATURES OF HEMATOLymphoid MALIGNANCY IN PLEURAL EFFUSION

M. A. Kim and I.A. Park

OBJECTIVE: We studied the cytologic features of pleural effusion involved by tumors of hematopoietic and lymphoid tissues. We searched for the cytologic clues for the discrimination of each histologic subtype in effusion.

MATERIALS AND METHODS: We retrospectively reviewed the slides of cases diagnosed as hematolymphoid malignancy in pleural effusion, at the Department of Pathology, Seoul National University Hospital, during 1996 and 2005. The slides were stained with Papanicolaou and Diff-Quik stains. The hematolymphoid malignancy involved by tumors of hematopoietic and lymphoid tissues. We searched for the cytologic clues for the discrimination of each histologic subtype in effusion.

RESULTS: Sixty-five cases were involved by hematolymphoid malignancy in pleural effusion. Of these 65 patients, 54 (83.1%) cases had a histologic diagnosis of malignant lymphoma including 1 case of Hodgkin’s lymphoma (HL). Among the 53 cases of non-Hodgkin’s lymphoma (NHL), 29 cases (54.7%) were B-cell lymphoma and 24 cases (45.3%) were T-cell lymphoma. Cytologic features of B-cell NHL were numerous, relatively monotonous populations of atypical lymphoid cells admixed with some reactive mesothelial cells. Whereas the cytologic features of T-cell NHL were some atypical lymphoid cells scattered in the background of numerous various kinds of inflammatory cells such as mature lymphocytes, eosinophils and plasma cells. Eleven (16.9%) cases were from the patients with leukemia. Leukemic involvement in pleural effusion reflected the cell population with primitive blastic cytologic appearances. They were also clearly demonstrated in the fluid clot section. The malignant cells in the clot material were positive for cytokeratin 7, BerEP4 and 34 βE12, TTF1, cytokeratin 20 and calretinin were negative. In view of the combined morphologic and immunohistochemical findings, a diagnosis of metastatic transitional cell carcinoma was made. Following diagnosis the previous bladder and omental cake biopsies were reviewed. Similar inclusions were also seen in both of these specimens.

CONCLUSION: To our knowledge, eosinophilic cytoplasmic inclusions have been noted previously in pleural effusion fluid obtained from patients with transitional cell carcinoma in only one previous study. The presence of such inclusions should always raise the possibility of this neoplasm before the effusion is deemed to be due to one of the more usual causes of a metastatic effusion.

From Manchester Cytology Centre, Manchester, U.K.
ic variations and overlapping features.

From the Department of Pathology, Seoul National University College of Medicine, Seoul, Korea.

P-028 DNA ANALYSIS IN EVALUATION OF MALIGNANT AND PREMALIGNANT BILIARY STRICTURES IN PRIMARY SCLEROSING CHOLANGITIS

L. Halme, L. Krogerus, K. Numminen, H. Mäkisalo, M. Färkkilä and J. Arola

BACKGROUND: In patients with primary sclerosing cholangitis (PSC) differential diagnosis of benign, premalignant and malignant biliary strictures is difficult. The aim of this study was to evaluate the role of DNA analysis in combination with brush cytology to detect dysplasia and malignancy.

METHODS: Endoscopic retrograde cholangiography (ERC) with brush samples of biliary strictures (n = 77) was performed on 61 patients with PSC. Brush samples were taken for cytology and for evaluation of DNA content was analyzed with flow cytometry.

RESULTS: An aneuploid finding in DNA analysis was found in 12 (20%) patients (in 16% of the examinations). Cholangiocarcinoma was verified in 3 patients and resection specimens of extrabiliary bile ducts showed dysplasia (2 high grade, 2 mild) in 4 of them. In 1 patient, no dysplasia or malignancy was found in the explanted liver graft. Four patients are still under the evaluation. DNA content was diploid in 49 patients, 9 (18%) of whom showed later a malignancy. Four of these patients had cholangiocarcinoma in the extrabiliary stricture. Two patients had peripheral cholangiocarcinoma beyond the reach of brushing, 2 had gallbladder carcinoma and 1 pancreatic carcinoma. Of all cytologic samples, 86% were benign and none stringently malignant. In those 10 patients with brush cytology ≥ RIII, 5 had aneuploidy in flow cytometry (50%), whereas aneuploidy was seen in 7 patients with brush cytology RII.

CONCLUSION: Determining DNA ploidy added to brush cytology during ERC may serve as a useful tool in identifying those PSC patients who are at higher risk to develop cholangiocarcinoma.

From HUS and Haartman Institute, Helsinki, Finland.

P-029 CYTOLOGIC DIAGNOSIS OF GALLBLADDER LESIONS: A STUDY OF 150 CASES

U. Handa, A. NANDA, H. Mohan, S. Kochhar and A. Sachdev

OBJECTIVE: Gallbladder (GB) carcinoma is among the 5 most common forms of cancer worldwide. Its incidence is high in India, varying from 0.5 to 2.6 per 100,000 men and 0.8 to 6.6 per 100,000 women. In the present study we reviewed ultrasound (US)-guided aspiration of GB lesions along with clinic radiologic correlation.

MATERIALS AND METHODS: The present study was carried out on 150 patients suspected to have gallbladder lesions on ultrasonography. US-guided fine needle aspiration (FNA) from GB was done in these patients along with FNA of other organs in 20 patients. Ascitic fluid was examined for malignant cells in 8 cases presenting with ascites. Histopathology of the gallbladder was available in 14 cases.

RESULTS: Ultrasonography in these patients revealed a mass or thickening of the wall of the GB in 140 (93.3%) cases, with nonspecific US findings in 10 (6.7%). Of the 140 cases, malignancy was cytologically diagnosed in 105 (70%) cases; 12 (8%) were inflammatory and 23 (15.3%) were inconclusive. Adenocarcinoma was the most common morphologic type. Metastatic tumor deposits were noted in FNA samples from space-occupying lesions of the liver in 12 cases, abdominal lymph nodes in 5 cases, and 1 case each of supravacuicular lymph node, stomach and bilateral ovaries. Ascitic fluid showed adenocarcinomatous deposits in 1 patient. Cytohistologic correlation was observed in all 14 cases. Of the 10 cases with nonspecific US findings, 3 had carcinoma and 7 were inconclusive on cytotologic examination.

CONCLUSION: US-guided FNA provides a rapid and reliable diagnosis in advanced, unresectable cases of GB carcinoma.

From Government Medical College, Chandigarh, India.

P-030 SQUAMOUS METAPLASIA IN ESOPHAGEAL SMEARS

F. S. Venter and G. M. Learmonth

The concept of squamous metaplasia in the esophageal mucosa and the role it plays in the development of squamous carcinoma are controversial. In presence may provide an explanation for the multifocal deeply penetrating squamous neoplasia that occurs in the esophagus. Indeed, it has many similar morphologic features to squamous metaplasia in the uterine cervix. Cases of esophageal metaplasia in others organs from symptomless persons, so the issue of squamous metaplasia rarely arises. A screening project amongst groups of people living in an area at high risk for esophageal squamous carcinoma yielded esophageal intramucosal material from symptomless volunteers. A compressed gelatin-covered polyurethane foam ball attached to a string was used to collect this cellular material. The majority of cells seen on the smears were surface and intermediate cells. Microbiopsies of epithelial cells representing the squamocolumnar junction (SCJ) were noted with adjacent squamous metaplastic cells. These were more prevalent when there was concomitant cellular evidence of high-grade squamous intraepithelial lesion. Some of these microbiopsies accurately reflect the changing patterns seen on histologic biopsies of normal, dysplastic and neoplastic processes. Photomicrographs clearly demonstrate this. It may be possible (as in neoplasia in the cervix) that when columnar or cuboidal epithelium in the excretory ducts of the submucosal glands of the esophagus is damaged due to chronic irritation (reflux, induced vomiting, alteration in pH) that the reserve cells may proliferate in an uncontrolled manner, as has been observed in the cervix. It is clear from observations of esophageal mucosal epithelial cells that squamous metaplasia is a reality and should be further investigated in the evolution and morphogenesis of squamous carcinoma of the esophagus.

From the Promec Unit, Medical Research Council, Tygerberg, and Anatomical Pathology, University of Cape Town, Cape Town, South Africa.

P-031 CHANGES OF THE GENETIC MATERIAL CONTENT IN PANCREATIC NUCLEI OF FETUSES AND NEWBORNS OF MOTHERS WITH VARIOUS DEGREES OF ANEMIA SEVERITY

O. Polyakova

Numerous recent research efforts studied the mechanisms of regu-
P-033  FINE NEEDLE ASPIRATION BIOPSY OF LIVER LESIONS: 6 YEARS EXPERIENCE IN 839 CASES

R. Ramazanoglu, N. Uygun, H. Durak, C. Cakalir, G. Ozbay and M. Cantasdemir

OBJECTIVE: We aimed to determine the role and efficacy of fine needle aspiration biopsy (FNAB) in liver lesions.

MATERIALS AND METHODS: We retrospectively evaluated 839 cases of liver lesions together with their clinical and radiologic data as stated in cytopathology reports. All of the cases were diagnosed between the years 2000 and 2005 in our department. FNAB of the vast majority of the cases (801 cases, 95.5%) were performed under radiologic guidance of ultrasonography in the radiology department, where a pathologist evaluated the adequacy of the aspirated material onsite. Synchronous core needle biopsies (CNB) were performed in 151 cases, 83.4% of which were done in the radiology department.

RESULTS: We grouped the cases in our series (839 cases) into 7 categories: (1) nonneoplastic lesions, 68 cases (8%); (2) benign tumors and tumor-like lesions, 44 cases (5%); (3) malignant, 488 cases (58%); primary, 83 cases; metastatic, 405 cases; (4) carcinoma (NOS), 14 cases (2%); (5) suspicious for malignancy, 21 cases (3%); (6) nonspecific parenchymal changes, 153 cases (18%); (7) insufficient, 51 cases (6%). Among the benign tumors, the most common was hemangioma, whereas in malignant ones metastatic tumors (83%) were the most frequent. Seventy percent of the metastatic tumors were adenocarcinomas. Majority of the primary malignancies were hepatocellular carcinomas (58% cases). When CNBs performed in the radiology department were compared with their synchronous FNABs, diagnoses were concurrent in 88 out of 126 cases and in 22 FNABs were more specific.

CONCLUSION: A wide variety of tumors can be seen in liver; therefore, careful examination combined with expertise will definitely help in arriving at an accurate diagnosis in liver lesions. FNAB is an efficient tool and a reliable method of choice in defining the nature of liver lesions.

From Kharkov National University, Kharkiv, Ukraine.

P-032  MULTIPLE MYELOMA DIAGNOSED IN FINE NEEDLE ASPIRATION OF THE LIVER: A CASE REPORT

M. Kardari, D. J. Papachristou, S. Sidira and C. H. Psachoulia

BACKGROUND: Multiple myeloma (MM) is a neoplastic proliferation of plasma cells accompanied by the production of a monoclonal immunoglobulin detectable in the serum or urine. There is relatively little information regarding the use of fine needle aspiration (FNA) in the diagnosis of extranodal and extramedullary hematopoietic malignancies. We present a case of MM diagnosed on FNA of the liver.

CASE: A 75-year-old man was admitted to the hospital because of the presence of multiple liver nodules on computed tomography scan. FNA of the liver was performed, and the aspirates were stained with Papanicolaou stain. Cytologic examination of the smears revealed the presence of mature plasma cells with the characteristic “cartwheel” distribution of nuclear chromatin. Moreover, the presence of immature, pleomorphic, mononucleated and binucleated neoplastic cells with mitotic figures, isolated with abundant cytoplasm, were observed. In the background, necrosis was found. The immunocytochemical staining was positive for CD138 and negative for cytokeratins 20 and 8. A cytologic diagnosis of MM was made, confirmed by the patient’s clinical findings.

CONCLUSION: The cytologic diagnosis of MM of the liver on FNA is accurate when the cytologic findings are correlated with the immunocytochemical data.

From the Department of Pathology and Cytology, University Hospital of Patras, Patras, Greece.

P-034  INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM OF THE PANCREAS: CYTOLOGIC FINDINGS IN SUBTYPES

M. Shimizu, S. Ban, J. Maniwa, K. Kawashima and Y. Shimizu

OBJECTIVE: To investigate and compare the histologic subtypes (i.e., gastric, intestinal, pancreatobiliary and oncocytic) and their cytologic findings in intraductal papillary mucinous neoplasms (IPMNs) of the pancreas, since the cytologic findings in these subtypes have not been described so far.

STUDY DESIGN: Representative hematoxylin-eosin (H-E), immunostained and cytology slides of subtypes of IPMNs were selected from the pathology files of several institutions. Then, 10 representative cases were chosen, and according to the H-E and immunohistochemical findings, including MUC1, MUC2 and MUC5AC, of IPMN cases, we evaluated their cytologic findings. The cytologic specimens included pancreatic juice, imprint and brush cytology materials.

RESULTS: Gastric type IPMNs showed flat sheets (2-D structure), whereas intestinal IPMNs revealed 3-D clusters. In addition, the gastric IPMNs demonstrated the presence of cribriform-like
small glands, whereas the intestinal IPMNs showed a papillary structure with stroma. The appearance of the nuclei was also different. The nuclear shape of the gastric type was oval, and the intestinal type showed a long oval nucleus. The pancreateobiliary type IPMNs revealed increased granular chromatin and macronucleoli. The oncocytic type IPMNs were characterized by their granular cytoplasm, and showed a transitional area from the gastric type. The grade of the nuclear atypia was also classified into benign (low), borderline (intermediate to high), and carcinoma (high) in the gastric and intestinal types. The oncocytic type usually showed a high grade of atypia.

CONCLUSION: Although cytologic findings of IPMNs of the pancreas are not uniform, recognition of nuclear shape and several cytologic structures, such as nuclear position, stromal components and cohesiveness, may be helpful to classify IPMNs into the 4 subtypes. In addition, the grade of nuclear atypia as well as necrosis should be considered when evaluating the grade of IPMNs.

From Saitama Medical University School of Medicine, Saitama Public Welfare Union, Kumagaya General Hospital, and Toda Central Medical Laboratory, Saitama, Japan.

P-035 LIQUID-BASED CYTOLOGY OF URINE AND DIFFUSIONS: PITFALLS AND EFFECTS ON DIAGNOSTIC CRITERIA

K. Losell, N. Zendehrokh, I. Solding and A. Dejmek

OBJECTIVE: ThinPrep has been extensively studied in gynecologic cytology, but its effect on diagnostic criteria and accuracy in nongynecologic cytology has attracted less attention. Therefore, our aim was to compare the diagnostic performances and effects on diagnostic criteria in ThinPrep and conventional cytologic preparations from nongynecologic specimens.

MATERIALS AND METHODS: ThinPrep slides from 47 urinary specimens (23 voided urine, 15 bladder urine, 10 bladder washings) and 10 effusions were compared with traditional preparations.

RESULTS: In 15 of 47 urinary specimens (4 malignant and 10 benign cases) the ThinPrep and filter preparation diagnoses disagreed. Three uroepithelial cancers were underdiagnosed in ThinPrep due to fewer and smaller uroepithelial cell clusters. Two benign cases were diagnosed as atypical in ThinPrep and filter preparations, respectively. In 5 of the discrepant benign cases the filter preparations could not be evaluated due to large amounts of salt crystals, whereas the ThinPrep slides contained diagnostic cells. In 7 cases the cellularity in filter preparations was higher than in ThinPrep, in 6 cases it was the other way round. Reduced cell cohesion was seen in malignant cells in effusions, especially in a case of papillary carcinoma and in a case of small cell carcinoma. In one malignant effusion containing diagnostic cells in the routine smear, no malignant cells were found in ThinPrep.

CONCLUSION: The series is too small to allow definite conclusions regarding diagnostic performances, but the study shows that ThinPrep is not always superior to our traditional preparations. ThinPrep was advantageous in urine rich in salt crystals. However, the reduced cell cohesion seen in ThinPrep is a pitfall, especially in cases in which cellular architecture is an important diagnostic criterion, such as well-differentiated uroepithelial carcinoma and in effusions, papillary and small cell carcinomas.

From Jules Bordet Institute, Brussels, Belgium.

P-036 DUCTAL ADENOCARCINOMA OF THE PROSTATE PRESENTING AS A PROSTATIC CYST: REPORT OF A CASE DIAGNOSED BY FINE NEEDLE ASPIRATION CYTOLOGY

A. Haller, R. Van Velthoven, F. Vansnick, J. L. Dargent and A. Verhest

Ductal adenocarcinoma of the prostate (DAP) is a very rare variant of prostatic carcinoma, characterized by marked nuclear atypia and a papillary or cribriform pattern. We describe a very unusual case of DAP presenting as a prostatic cyst. A 55-year-old man with urinary obstructive symptoms and increased serum levels of prostate specific antigen (PSA) was admitted to our institution. A digital rectal examination revealed a prostate markedly increased in size. Both ultrasonography and magnetic resonance imaging (MRI) demonstrated a cystic lesion of approximately 1.5 cm, localized in the left lobe of the prostate. Moreover, urethroscopy revealed the presence of a polypoid lesion protruding into the prostatic urethra. Fine needle aspiration cytology of the prostatic cyst showed numerous cellular clusters featuring a papillary architecture. These were composed of highly atypical cells expressing PSA, prostatic acid phosphatase (PAP), and 2-methyl-coenzyme A racemase. By contrast, antibodies directed against poor or high molecular weight keratins (HBP12) displayed no staining. Transrectal needle biopsies were difficult to obtain. They showed a cystic tumor process composed of neoplastic papillary structures, associated with conventional acinar carcinoma and high-grade prostatic intraepithelial neoplasia (PIN). Histologic examination of the polypoid lesion protruding into the prostatic urethra revealed a polyp involved by tumor cells. These diffusely expressed both PSA and PAP, indicating urethral involvement by the tumor process. Furthermore, a performed lymph node biopsion showed a metastasis in the right pelvic lymph node. Combined treatment with luteinizing hormone-releasing hormone (LHRH) analog and radiation therapy was given, with a good result from the onset.

From Jules Bordet Institute, Brussels, Belgium.

P-037 EFFECTIVENESS OF LIQUID-BASED CYTOLOGY MONOLAYER TECHNIQUE AND CYTOSPIN PREPARATION OF REPEATED URINE CYTOLOGY: A COMPARATIVE ANALYSIS

S. W. Hong, J. E. Kwon, H. K. Kim and Y. J. Kim

Once diagnosed as “cell paucity” or “atypia” by the cytospin (CS) preparation, CS does not provide a precise diagnosis by repeated testing alone. Although the ThinPrep (TP) preparation is acknowledged as increasing cellularity, screening tests of the cases in which enough cellularity is obtained by CS raises a cost-effectiveness problem. To obtain more precise diagnosis through increasing cellularity by TP, we selected cases diagnosed as “cell paucity” or “atypia” by CS, but requiring a more precise diagnosis, and processed with both CS and TP to compare the results. Six patients diagnosed as having cell paucity, and 11 patients diagnosed as atypia by CS were included in the test. Among 6 cases diagnosed as cell paucity by CS, TP successfully obtained the diagnostic cellularity of...
all 6 cases. However, CS succeeded in only 3 cases of the diagnostic cellularity but the other 3 cases were still diagnosed as cell paucity. The important point is that among 3 cases of cell paucity by CS, TP diagnosed 2 cases as “negative for malignancy (NFM)” and 1 case as atypia. Among 11 cases diagnosed as atypia by CS, 4 cases revealed different test results, but 7 cases showed similar test results. All 4 cases that showed different test results were diagnosed as NFM by CS, but 3 of them were diagnosed as atypia and 1 of them was diagnosed as “a highly atypical cell” by TP. Of 7 cases that showed similar test results, 3 were diagnosed as NFM, 2 as “reactive cellular change,” 1 as “a few atypical cells,” and as “suspicous of malignancy” by both preparations. Particularly, we repeated TP on the 1 case diagnosed as atypia and processed polyoma virus immunohistochemical stain, confirming polyoma virus. In conclusion, we can avoid the negative diagnosis from uncertain atypia or cell paucity by repeated testing by TP.

From Young-Dong Severance Hospital, Seoul; and National Health Insurance Corporation Ilsan Hospital, Goyang, Korea.

P-038 OUR EXPERIENCE FROM THE USE OF IMMUNOCYT™/uCyt+ TEST IN THE DIAGNOSIS AND FOLLOW-UP OF PATIENTS WITH UROTHELIAL CARCINOMAS

R. Valeri, N. Dimasis, D. Gerasimidou, L. Kampas, S. Papadopoulou, S. Peftoulidis and C. Destouni

OBJECTIVE: At present, cytoscopy and cytology are still considered the gold standard methods for the detection of bladder cancer. Recently, a new diagnostic test has been developed by Fradet et al. in order to overcome the limitation of these methods. The ImmunoCyt™/uCyt+ test is a noninvasive fluorescence test combining 3 monoclonal antibodies (M 344, LDQ 10 and 19A211) directed against urothelial carcinoma antigens in exfoliated cells in urine. The purpose of this study was to evaluate the clinical value of ImmunoCyt™/uCyt+ test as a complement to Cytology in the diagnosis and follow-up of patients with urothelial carcinomas.

MATERIALS AND METHODS: A total of 285 voided urine specimens of patients presented to our hospital for either urinary symptoms or for follow-up for bladder tumors were examined. Urine samples were prepared using ThinPrep technique and the ImmunoCyt test was performed from the remaining material in the PreservCyt solution. The red or green fluorescence-positive cells were detected on the slide using a fluorescence microscope. The patients were divided in 3 groups: (1) with benign lesions (2) with urothelial carcinomas (3) for follow-up (with bladder cancer history).

RESULTS: Of the 285 cases, 245 concerned primary urothelial carcinomas and follow-up cases and 45 were benign lesions. The overall diagnostic accuracy for cytology and uCyt+, respectively, was 90.49–95.10%, while the combination of both was 98.82%.

CONCLUSION: From the analysis of our results we concluded that the immunocyto™/uCyt+ test combined with cytology is highly sensitive for tumors of all grades and that the immunocyto™/uCyt+ test enhances the sensitivity of cytology in low-grade tumors or in cases of severe atypia. It is the most suitable available marker for monitoring strategies in patients with low-risk bladder cancer.

From the Departments of Cytopathology and Urology, Greece.

P-039 TWO CASES OF URACHAL ADENOCARCINOMA MIMICKING UROTHELIAL CARCINOMA IN URINE CYTOLGY

M. Kinjo, M. Kano, H. Yamada and A. Moriuchi

BACKGROUND: Urachal carcinoma arises in the urachal remnant present in the median cord from the dome of the urinary bladder to the navel. Most of them are adenocarcinoma, although benign urachal sinus is usually lined with immature urothelium. Most urachal carcinoma develops in the muscle layer of the dome and extends to the mucosa, followed by ulceration. Ulcerated tumor sheds malignant cells into the urine. Malignant cells in the urine cytology is often problematic on differential diagnosis with histologic type. Two cases with such diagnostic dilemma are presented.

CASE: In case No. 1 a 39-year-old man consulted the urology clinic for macroscopic hematuria. Computed tomography (CT) magnetic resonance imaging (MRI) revealed the tumor of the dome aspect. Voided urine cytology revealed atypical single cells and clusters, suggestive of low-grade urothelial carcinoma. The partially resected specimen shows urachal adenocarcinoma on histology.

CONCLUSION: From the Departments of Cytopathology and Urology, Greece.

P-040 URINARY CYTOLGIC DETECTION OF METASTATIC ADENOCARCINOMA OF THE URINARY TRACT

A. Moriuchi and M. Kinjo

OBJECTIVE: To facilitate detection of metastatic adenocarcinoma of the urinary tract, we conducted urinary cytologic analysis focusing on nuclear structural abnormality and cytoplasmic characteristics.

MATERIALS AND METHODS: We used urinary cytologic data of 2 cases of metastatic adenocarcinoma of the urinary tract from advanced colon cancer, which had been confirmed clinicopathologically. To define metastatic adenocarcinoma in the urinary cytology, we evaluated 3 points—malignancy, glandular nature and metastasis. We conducted cytologic analysis focusing on nuclear 3-D abnormality for the malignancy and metastasis points and cytoplasmic characteristics for the glandular nature point. Nuclear 3-D abnormality means 3-D abnormal distribution of intranuclear substance and can be detected by high-power microscopy. We call this finding the nuclear bulging sign (NBS).

RESULTS: In both cases, carcinoma cells are all positive and normal (or benign) urothelial cells are all negative for NBS. These cy-
RESULTS: The expression of p16INK4a protein in urine atypical cells was observed in 32% of cases (mild atypia, 8 of 25 cases; moderate to severe atypia, 21 cases; malignancy, 13 cases). p16INK4a-stained smears are grouped into 3 classes by a number and an intensity of positive cells: negative (<10% positive nuclei and cytoplasm), weak positive (>10% positive nuclei and cytoplasm), and strong positive (>10% positive nuclei and cytoplasm).

MATERIALS AND METHODS: A p16INK4a immunostaining was applied to 59 cases showing atypical and malignant cells in urine (mild atypia, 25 cases; moderate to severe atypia, 21 cases; malignancy, 13 cases). p16INK4a-stained smears are grouped into 3 classes by a number and an intensity of positive cells: negative (<10% positive nuclei and cytoplasm), weak positive (>10% positive of them with weak intensity) and strong positive (>10% positive of them with strong intensity).

RESULTS: The expression of p16INK4a protein in urine atypical cells was observed in 32% of cases (mild atypia, 8 of 25), 62% (moderate to severe atypia, 13 of 21), and 62% (malignancy, 8 of 13). Out of them, strong positive immunostaining was detected in 8 of 8, 3 of 13, and 4 of 8 cases, respectively.

CONCLUSION: By applying p16INK4a immunostaining, overexpression of p16INK4a protein is observed in 60% of cases that show atypical cells of moderate to severe atypia or malignancy. This suggests that p16INK4a immunocytochemical staining is to be a useful diagnostic index for supporting urine cytodiagnosis.
ing single slide preparation (55.6%, 90.9% and 38.5%, respectively). The specificity was similar with both methods (83.3%).

CONCLUSION: Using dual cytospin slide preparations significantly improves specimen adequacy, sensitivity, PPV and NPV of urine cytology samples. These advantages more than offset the slightly increased cost incurred in this practice.

From Tan Tock Seng Hospital, National University of Singapore, Doctors’ Laboratory Singapore, and Singapore General Hospital, Singapore.

P-044 AUDIT OF PAP SMEAR IN 22,540 PATIENTS
R. Chinoy, D. Ajit and S. Mane

OBJECTIVE: Tata Memorial Hospital organizes programs for cancer awareness and early detection. The present study is an audit of Pap smears collected over 10 years through these opportunistic screening programs.

METHODS: Total cases analyzed were 22,540 from 1996 to 2005 (10 years). Data were analyzed and correlated with final diagnosis, which was based on histology (380 cases) and clinical and follow-up status (≤ 1 year).

RESULTS: Smears were evaluated using TBS 2001. A total of 22,095 (98.03%) were cytologically negative for intraepithelial lesions: The cytologically positive group contained 445 (1.97%) (atypical squamous cells of undetermined significance [ASCUS], 13.26%; low-grade squamous intraepithelial lesions [LSILs], 17.98%; high-grade squamous [ASC-Hs], 3.82%; high-grade squamous intraepithelial lesions [HSILs], 46.07%; squamous carcinoma, 11.01%; atypical glandular cells [AGCs], 6.74%; adenosquamous carcinoma, 1.12%). There were 15 false negative and 14 false positive cases. Reasons for false negativity were sampling errors in 14 cases and screening error in 1 case. The false positive diagnosis was primarily due to interpretative error.

CONCLUSION: The false positive diagnoses were attributed to cellular changes associated with atrophy (7), inflammation (3), processing artefacts (3) and folic acid deficiency (3). The underdiagnosis was due to sampling error (14), deep-seated lesions (5) that were not possible to access on cytology or involvement of a single focus (6) of the lesion as noted on histology.

From Tata Memorial Hospital, Mumbai, India.

P-045 COMPARISON OF A NEW LIQUID-BASED CERVICAL CYTOLOGY AND CONVENTIONAL PAP SMEAR

OBJECTIVE: The aim of this investigation was to compare the screening performance of conventional smears with the new liquid-based cytology method Liqui-PREP™ in a low-risk population, using colposcopy followed histology as the gold standard.

MATERIALS AND METHODS: This prospective study was performed in a general gynecology clinic in ValiAsr University Hospital, Tehran, Iran, from February 2004 to March 2005. The split-sample method was used for preparing conventional and liquid-based cytology. A new technique of liquid-based cytology, Liqui-PREP™, was used in this study. All positive results of smears and 10% of negative results in each group were submitted to colposcopy, and a biopsy was taken when any atypical transformation zone was seen. Sensitivity, specificity, positive and negative predictive values and overall accuracy of both conventional and Liqui-PREP™ methods were computed in relation to histology.

RESULTS: A total of 506 patients were analyzed by 2 cytology methods and in 67 cases (13.2%) histologic diagnosis was performed. There were 7 cases of atypical squamous cells of undetermined significance (ASCUS), 2 high-grade atypical squamous cells (ASC-H) and 2 atypical glandular cells (AGC) in conventional Pap results. Abnormal epithelial cells were found in 5 cases with Liqui-PREP™ method, consisting of 2 ASCUS, 2 ASC-H and 1 AGC. Assessment with colposcopy showed sensitivity 86%, specificity 98.5%, positive predictive value 86% and negative predictive value 98.5% for Liqui-PREP™. The results of this study showed sensitivity 58%, specificity 88%, positive predictive value 74% and negative predictive value 96% for conventional method. Conventional smears had more severe inflammation (26%) compared to Liqui-PREP™ tests (19%) (McNemar Value = 0.007) with equal satisfactory and unsatisfactory results.

CONCLUSION: This study confirms the superiority of the Liqui-PREP™ method to detect cervical lesions. The rate of inflammatory Liqui-PREP™ slides was significantly lower than with conventional cytology.

From Tehran University, ValiAsr Hospital, ValiAsr Reproductive Health Center, and Imam Khomeini Hospital, Tehran; Mazandaran University of Medical Sciences, Babolsar; and Gilan University of Medical Sciences, Rasht, Iran.

P-046 CERVICOVAGINAL SMEAR ABNORMALITIES IN SEXUALLY ACTIVE ADOLESCENT PREGNANT WOMEN
C. Cono, C. Silva, S. Anjos, M. Mantovani and A. Bertini

OBJECTIVE: To assess the prevalence and spectrum of Pap smear abnormalities in adolescent pregnant women.

STUDY DESIGN: A total of 1,367 adolescent (from 10 to 19 years old) pregnant women who consulted the antenatal clinics at the Federal University Medical School of São Paulo from January 1997 to September 2006 were considered in the study. Since 1977 our policy is to perform Pap smears at first consultation of all pregnant women, regardless age, parity and period of pregnancy. To express the cytologic results we used the Bethesda System nomenclature: low- and high-grade squamous intraepithelial lesion (LSIL and HSIL). For changes that could not be qualified, atypical squamous cells of undetermined significance (ASCUS) was used. LSIL (human papilloma virus [HPV] and cervical intraepithelial neoplasia [CIN] ± HPV); HSIL (CIN2 ± HPV; CIN3 ± HPV; microinvasive lesions); these refer to preclinical lesions of the uterine cervix. All patients with cytologic diagnoses of LSIL, HSIL and ASCUS, were send to the Colposcopy and Genitoscope Service. The colposcopic appearances were classified according to the criteria of Stall and Mattingly. In cases of abnormal findings, colposcopic biopsies were made and material was sent for histopathologic diagnosis. When surgical action was indicated during puerperium (puerperium for SILs is until 1 year after delivery, OMS), few cases, we got a final diagnosis. The EPI INFO EXCEL Database was used.

RESULTS: The average age was 17.2 (13–19) years old, pregnancy age was 19.4 weeks and first intercourse occurred at 15 years (average). The average number of pregnancies was 1.69 and average number of partners was 1.79. The abnormal cytology results were
as follows: SIL or HSIL, 136 (10%) cases; ASCUS 12 cases; LSIL, 110 (74.32% of all abnormal cases), with HPV 65 cases and CIN1 ± HPV, 45 cases; and HSIL was CIN2 ± HPV, 23; CIN 3 ± HPV, 3; and microinvasive 0 (zero). The age for CIN 3 was: 15, 17, and 18 years old. There were 32 (2.29% of all adolescents) adolescent pregnant women who were HIV+. In this group there were 18 (56.81%) abnormal cytology diagnoses. The more common infectious agents were Gardnerella vaginalis (33.45%) and Candida albicans (37.36%).

CONCLUSION: This paper stresses the importance of including adolescents in any SIL detection program.

From the Federal University Medical School of São Paulo, Brazil.

P-047 AN ANALYSIS OF EPITHELIAL CELL ABNORMALITIES IN CONVENTIONAL CYTOLOGY SMEARS WITH REPEAT CYTOLOGY, COLPOSCOPY AND CERVICAL BIOPSIES

S. Cherian, R. Kulkarni, V. Arora and D. Joshi

OBJECTIVE: To identify cost-effective methodology to screen women for cervical cancer in developing world, in absence of newer technologies (HPV-DNA testing and liquid-based cytology).

MATERIALS AND METHODS: Over a 5-year period, 4,633 women (aged 20–75) who visited the gynecology department for annual examination or complaints were studied. Per speculum examination was undertaken and cervical smears obtained. Papangellou staining was done and reported using the 2001 Bethesda System. Smears reported as atypical squamous cells of undetermined significance (ASCUS) were clinically followed with repeat smears after 3–6 months. Colposcopy was done in all cases of persistent (> 3 occasions) ASCUS, low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL) and atypical glandular cells (AGC). Colposcopy-directed biopsies were taken from abnormal areas. Direct cervical biopsy was done when cytology was reported as carcinoma.

RESULTS: A total of 8,992 (100%) smears were studied; 6,633 (71.6%) were adequate and satisfactory for evaluation. Of the 565 (6.43%) ASCUS smears (4.8%) showed epithelial cell abnormalities, of which 385 (4.3%) showed ASCUS, 22 (0.24%) LSIL, 6 (0.07%) HSIL, 13 (0.14%) shows suspicious for invasive squamous cell carcinoma (ISCC), 8 (0.09%) AGCC and 1 (0.01%) adenocarcinoma. These 385 ASCUS smears included smears from 14 women with persistent ASCUS. These women, along with LSIL, HSIL and AGC cases, totaling 50 women underwent colposcopy; 96% of them showed colposcopic abnormalities. Colposcopy-directed biopsies of all showed 92% squamous intraepithelial lesions (SILs), 4% ISCC and 2% adenocarcinoma. Cytology results reported suspicious for ISCC were all confirmed on direct biopsy. All patients with ISCC presented with persistent vaginal bleeding and average age of years and never had a previous Pap smear.

CONCLUSION: Follow-up of epithelial cell abnormalities with repeat cytology, colposcopy and histology helped in the diagnosis and management of cervical SILs/cancer. Screening in postmenopausal women needs to be emphasized to help early detection.

From BARC Hospital, Mumbai, India.

P-048 COMPARISON OF CONVENTIONAL PAP SMEAR AND THIN-LAYER PREPARATION WITH CERVICAL BIOPSY AS GOLD STANDARD

R. Moraes, Jr, H. Limoeiro, R. Bacie, L. Gomes, G. Guimaraes and M. Freitas

OBJECTIVE: To compare the relative sensitivity of a new lower cost manual liquid-based thin-layer preparation to conventional Pap smears using cervical biopsy as the standard for comparison.

MATERIALS AND METHODS: Patients were selected based on Pap smears previously screened as positive by conventional cytology or suspect for cervical cancer in the city of Barueri, Brazil. Results from GluCyte liquid-based preparations and another conventional Pap smear and biopsy were compared in this study. Patients had colposcopic examination, and a post sample from the uterine cervix was obtained using the Rovers Cervix Brush. A new conventional smear was made and the brush consisting of residual material was sent to the laboratory in the Synermed Preservative Vial. The Pap test samples were processed utilizing the GluCyte method, and both samples (conventional and liquid-based) were stained using the conventional Pap staining method. When the biopsy was performed, it was sent at the same time to the laboratory and processed in the routine manner. The liquid-based and conventional smears were identified and randomly mixed, blinded and read by three expert cytologists. The results of conventional and liquid-based cytology smears were compared to evaluate the diagnostic agreement between the cytology preparations and the biopsies.

RESULTS: In 100 patients, 39 biopsies were performed. From these cases, 27 were low grade and 13 high grade. The study showed that the conventional cytology had an agreement in 55% of the biopsies. Synermed GluCyte liquid-based thin-layer preparations yielded results that coincided with biopsy results in 77% of the cases.

CONCLUSION: The report suggests the GluCyte liquid-based method is more sensitive than conventional cytology in comparison with biopsy results as the gold standard for diagnosis of cervical cancer. More randomized studies comparing the two methods and biopsies are needed to be performed.

From Hospital Geral de Itapevi and SAMEB Barueri, Brazil.

P-049 NECESSITY OF SCREENING FOR UTERINE CERVICAL CANCER IN WOMEN YOUNGER THAN 30 YEARS

M. Masayuki, Y. Yoshiihito, T. Tsuyoshi and H. Hideki

OBJECTIVE: In 2004, Japanese government recommended that screening for uterine cervical cancer should be conducted for women aged 20–29 years. The purpose of study is to analyze the results of screening for uterine cervical cancer performed for women < 30 years old.

METHODS: We examined the data of 651,408 women who received screening for uterine cervical cancer between 1989 and 2003 in Aomori prefecture, Japan. Of those, we examined the data of 124,368 women with abnormal cytodiagnosis.

RESULTS: A total of 23,754 women (19.1%) were < 30 years and 1,741 (1.4%) were < 20 years old. The ratio of women < 30 years old has not changed for 15 years. While the frequency with abnormal cytodiagnosis was 2.8% in 1989, it increased to 9.2% in 2003. The frequency of pregnant women with abnormal cytodiagnosis has remained 1–5% for 15 years. That of nonpregnant women with ab-
normal cytdiagnosis was 2% in 1989, but it increased to 11.7% in 2003. Although the frequency of women < 20 years old with abnormal cytodiagnosis was 3.7% in 1989, it increased to 13.2% in 2003. A total of 253 women < 30 years old underwent treatment. Their final diagnosis was carcinoma in situ, 205; cervical squamous cell carcinoma, 39; cervical adenocarcinoma, 5; and other carcinoma, 4. **CONCLUSION:** We have to call women < 30 years old to receive the screening for uterine cervical cancer.

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**P-051 UTILITIY OF HISTIOCYTIC IMMUNOMARKERS IN DIFFERENTIATING HISTIOCYTIC AGGREGATES WITH MARKED NUCLEAR ATYPIA FROM HIGH-GRADE SQUAMOUS INTRAEPITHELIAL LESIONS IN LIQUID-BASED CYTOLOGY SPECIMENS: REPORT OF 2 CASES**

T. Giorgadze, L. Miller, J. Preiszner and A. Nassar

**OBJECTIVE:** Histiocytes in liquid-based cytology (LBC) Pap smears may form tissue fragments with marked cytologic atypia, including high nuclear to cytoplasmic ratio, nuclear membrane irregularities and nuclear hyperchromasia, thus mimicking high-grade squamous intraepithelial lesions (HSILs). Implementation of LBC Pap tests offered the distinct advantage of applying ancillary tests to cellular material remaining in fluid fixative. In this study we report 2 cases in which immunocytochemistry for histiocytic markers was successfully applied to LBC preparations in order to discriminate histiocytic aggregates with marked nuclear atypia from HSILs.

**MATERIALS AND METHODS:** Two cases from patients whose LBC Pap smears showed tissue fragments with marked nuclear atypia similar to those seen in HSILs were presented in this study. Patients were 24 and 27 years old with no prior history of abnormal Pap smear. The specimen from 1 patient was obtained in her midcycle, and the other patient's menstrual history was unknown. The LBC specimens were fixed in Carnoy fixative, processed by ThinPrep 2000 Processor and stained with a modified Papanicolaou stain. Immunocytochemical stains for HAM56 and CD68 were performed using avidin-biotin-peroxidase method on the ThinPrep slides prepared from the residual solutions in the specimen vial.

**RESULTS:** In both specimens, strong cytoplasmic staining for HAM56 and CD68 was detected in tissue fragments that posed diagnostic difficulties, thus confirming their histiocytic origin. There was no significant background staining. Squamous, endocervical, and other inflammatory cells were nonreactive with these immunomarkers.

**CONCLUSION:** Immunocytochemical stains for histiocytic markers (HAM56 and CD68) can be successfully applied to LBC preparations and appear to be a useful adjunct in distinguishing histiocytic aggregates with marked nuclear atypia from HSILs.

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**P-052 CELLULAR FEATURES OF VILLOGLANDULAR ADENOCARCINOMA OF THE UTERINE CERVIX**

T. Kagabu, M. Matsuta, C. Kon and S. Kudoh

**OBJECTIVE:** Villoglandular adenocarcinoma is a rare neoplasm of the cervix uteri. We report cellular characteristics of 3 cases of villoglandular adenocarcinoma of the uterine cervix.

**METHOD:** Three villoglandular cervical adenocarcinomas were described and the cytologic findings of conventional preparations were observed.

**RESULTS:** Postsurgical pathologic staging of 3 patients was as follows: Case No. 1 T1a2 (38 years old), Case No. 2 Tis (28 years old), Case No. 3 T1a1 (35 years old). Cytologic features were characterized by large cell groups of abnormal 3-D architecture. These endocervical cells were cohesive with nuclear crowding and loss of normal honeycomb pattern. Some of them had unique villous papillary arrangements with stromal cores. Cytologic atypia was minimal, compatible with endocervical adenocarcinoma in situ.

**CONCLUSION:** The cytologic characteristics of villoglandular adenocarcinoma were observed as architectural abnormalities of endocervical cell clusters by low-power magnification.
P-053 IMPORTANCE OF CYTODIAGNOSTICS FOR HIGH-RISK PREGNANCY SUPERVISION

J. Kobílková, Z. Hájek, M. Klimková and T. Fait

In a group of 101 patients with threatened preterm birth (median 28 ± 7 weeks) and 61 term deliveries (median 40 ± 2 weeks), the incidence of vaginal infection was diagnosed. The prediction of inflammation and the earlier birth, using bacterial culture, CRP, leukocytes + neutrophils and the endocervical smear Bethesda System reporting was evaluated in each group. The best prediction of earlier birth before 7 days from first symptoms has been made using leukocyte level (>18 x 10^9) in combination with patients’ clinical sign of inflammation (fever, maternal and fetal tachycardia, heavy discharge, etc.) (sensitivity 0.69, specificity 0.84, AUC 0.82). The Bethesda System has shown a very high sensitivity but lower specificity. The Bethesda System is able to recognize the inflamatory changes of cells and thus preparation for labor, but is not able to predict the time for earlier preterm birth.

From the Department of Gynecology and Obstetrics, Charles University, Prague, Czech Republic.

P-054 FLOW CYTOMETRY ANALYSIS OF DNA PLOIDY, S-PHASE AND PROLIFERATION OF ADVANCED CERVIX CANCER

O. A. Kravetz and V. N. Bogatyrev

OBJECTIVE: We are presently involved in a prospective study of the relationship between DNA content profiles and their changes during the radiation treatment for advanced cervix cancer.

METHODS: A total of 53 patients with TNM stage T2b-3bN0-1M0-1 cervical cancer were preliminarily analyzed. All patients were treated with combined external irradiation and brachytherapy. DNA flow cytometry were used in tumor cells for this group of patients, before the treatment, after the first step (before the brachytherapy) and after the whole course of treatment.

RESULTS: Among these patients, 14 (26.4%) had diploid tumors, 35 (66%) had aneuploid tumors and 4 (7.5%) had tetraploid tumors. In the diploid group the decrease of the proliferation rate during irradiation course (decreasing value of S-phase, G2+, IP) demonstrated the efficiency of the treatment course. The overall 3-year survival rate was 91.7%. The overall 3-year survival rate of aneuploid group was 56.1%. The aneuploid group with IP < 15% and S < 7% (n = 23) before the treatment and decreasing during it had the better prognostic factors. 9 (39.1%) patients had local or distant failure from 6 to 16 months (median 9.8 months). In IP 15–20% and S-phase 7–14% (n = 27) with identical tendency in changing of these parameters, the local or distant failure occurred in 5 (71.4%) patients from 2 to 14 months (median 8 months). In IP > 20% (n = 5) the local or distant failure occurred in 3 (60%) patients from 3 to 11 months (median 6.6 months).

CONCLUSION: According to our preliminary results the diploid DNA content was associated with better prognosis, while aneuploid tumors tended to be prognostically unfavorable. Analysis of the relationship between clinical stage of cervix cancer, histology and changes of S-phase and proliferation rate during radiation course suggests the outcome of disease.

From the Cancer Research Centre, Moscow, Russia.

P-055 CERVICAL LESION PROGRESSION PREDICTION BY P16INK IMMUNOASSAY

I. Krivak Bolanca, K. Sentija and S. Katalenic Simon

OBJECTIVE: One of the most important and major etiologic factor for cervical carcinogenesis is persistent papilloma infection. Almost two thirds of low-grade squamous intraepithelial lesion (LSILs) spontaneously regress; however, it is not predictable which cases of LSIL will progress. The aim of this study was to predict the progression of cervical lesion by detecting p16INK in abnormal smears before progression began.

METHODS: Each of 21 patients included in the study underwent conization and had histologic verification of high grade lesion: squamous intraepithelial lesion (HSIL). All patients’ archived smears were analyzed retrospectively. Smears following at least 2 previous abnormal smears was decolorized, immunostained and analyzed. Results were classified as positive or negative by morphology of cells and by intensity of staining reaction. The control group consisted of 10 patients with cytology and HPV-negative smears.

RESULTS: A positive reaction in smears was found in 80.95% (17 of 21) before progression started. In 11 patients follow-up started with cervical intraepithelial neoplasia (CIN1), six had CIN2 and 1 started with atypical squamous cells of undetermined significance (ASCUS). Among CIN1 smears, p16 was positive in 81.8% (9 of 11) and in the group with CIN2 positivity was 88.8% (8 of 9), with more intense staining in CIN2. In ASCUS the smear result was negative. In CIN1 and CIN2- and p16-positive smears, stained cells from deeper layers were found in 20% (9 of 11) and 88% (8 of 9), respectively. In the control group only 1 smear was slightly p16-positive.

CONCLUSION: Positivity of p16INK in abnormal smears before follow-up started suggests that we can predict disease progression. Finding p16-positive cells from deeper epithelium layers suggests that these smears were underdiagnosed. Therefore, to avoid this mistake, p16INK should be incorporated in routine laboratory practice for analysis and follow-up of LSIL smears.

From Merkur University Hospital, Zagreb, Croatia.

P-056 OUTCOME OF ADENOATYPIAS IN SCREENING PAP SMEARS

L. Krogerus, P. Laurila and J. Tarkkanen

OBJECTIVE: Atypia of cervical columnar cells is a difficult area of gynecologic cytology, and finding out how well the different methods do in detecting these lesions is a highly relevant question, especially when adopting new methods for cancer screening.

MATERIALS AND METHODS: During a 2-year period (2004–2005) 193 adenoatypias were diagnosed from 69,332 screening Pap smears of the conventional screening Pap smears with separate vaginal, portal and cervical specimens, in the department of pathology, Helsinki University Hospital. A total of 105 women were referred for colposcopy, of whom 5 patients did not show up and 1 had severe adenoatypia. A total of 100 colposcopies were performed; the remaining 88 women were followed with repeat smears at 6 and 12 months. In the repeat smears no adenoatypias were found, 7 patients were diagnosed with atypical squamous cells of undetermined significance (ASCUS) in the repeat smears, but thus far no colposcopies have been performed on these patients. In the colposcopies,
most of which also included endometrial samples, 8 adenocarcinomas were found; 4 of these were cervical cancers and 4 were endometrial cancers. There were also 6 cases of endometrial adenomatous hyperplasia, 3 cervical polyps, and 4 cases of chronic cervicitis. None of the adenocarcinoma patients had squamous atypia, whereas 11 of the adenocytaplasias proved histologically to be squamous dysplasias, and there were many human papillomavirus (HPV)-related koilocytic atypia without dysplasia. 

CONCLUSION: Looking for adenocytaplasias in Pap smears is important and should lead also to endometrial biopsy in addition to cervical biopsies. The Pap test proved to be useful in finding adenocytaplasias both in cervical and endometrial lesions, as well as squamous atypias.

From HUSLAB, Helsinki, Finland.

P-057 PAP SMEAR OF SECONDARY VAGINAL PAGET’S DISEASE OF UROTHELIAL ORIGIN: A CASE REPORT

Hsu-Pen Lin and Wei-Yu Chen

Extramammary Paget’s disease (EMPD) is relatively rare and most commonly affects the vulva. Most EMPD represents a primary skin neoplasm with sweat gland differentiation. Less commonly, it may secondarily extend from anorectal or uterine carcinoma. Cytologic features of primary EMPD in Pap smears and vulvar ablative cytology have been described, but those of secondary EMPD rarely reported. Awareness of cytologic features of EMPD can provide patients adequate management and prevent unnecessary therapies. Herein, we describe Pap smear findings of secondary EMPD of urothelial origin and discuss its differential diagnoses. A 43-year-old woman, with a past history of noninvasive high-grade papillary transitional cell carcinoma treated by transurethral resection and intravesical bacillus Calmette Guérin therapy 6 years before, received a screening Pap smear. The smear was initially interpreted as high-grade squamous intraepithelial lesion. The subsequent cervical biopsy and loop electrosurgical excision procedure demonstrated no significant epithelial lesion. Seven months before the smear, she underwent vulvectomy for secondary EMPD of urothelial origin, proved by immunohistochemistry. In this history was known until a follow-up Pap smear was done. The second smear gave a suspicion for urothelial carcinoma. Then the vaginal biopsy revealed the same secondary EMPD. These smears showed many large neoplastic cells with high nucleus to cytoplasm ratio, eccentrically located nuclei, coarse chromatolysis, rugged nuclear outlines, inconspicuous nucleoli, and basophilic cytoplasm. They were arranged in sheets or single cells. Obvious variation in the nuclear size was observed. Cannibalism (cells in cells), multinucleation and cytoplasmic vacuolation were commonly seen. The literature and smears revealed that a combination with clinical history and cytologic features such as cellular arrangement, eccentrically located nuclei, marked pleomorphism, cannibalism and cytoplasmic vacuolation may be helpful to distinguish between secondary EMPD and other diseases such as squamous cell carcinoma, squamous intraepithelial lesions and endocervical and endometrial adenocarcinoma.

From the Department of Pathology, Taipei Municipal Wan-Fang Hospital, Taipei, Taiwan.

P-058 SIGNIFICANCE OF ATYPICAL SQUAMOUS CELLS CYTOLOGIC FINDING IN MENOPAUSAL WOMEN

C. Zhou, D. van Niekerk, V. Moravan and J. Lo

OBJECTIVE: To determine an appropriate patient management guideline for menopausal women (women age ≥ 50) with a cytologic finding of atypical squamous cells (squamous cell atypia in a background of typical atrophic changes) in the British Columbia Cervical Cancer Screening Program (CCSP).

MATERIALS AND METHODS: A total of 169 atypical squamous cells cases from menopausal women in the year 2000, 60.3% of cases in the CCSP year 2000 database, were reviewed for analysis. Subsequent follow-up information on these women was extracted from the CCSP database, which contains both cytologic and histologic follow-up results. The year 2000 data were chosen for analysis to ensure sufficient time for subsequent follow-up procedures.

RESULTS: Of the 169 atypical squamous cells menopausal cases (86.98%), 147 had cytologic, histologic or both cytologic and histologic follow-up results. 22 (13.02%) had neither cytologic nor histologic follow-up and were excluded from the analysis. Of the 147 cases, 104 (70.75%) had normal cytologic follow-up and 43 (29.25%) had histologic follow-up either immediately or subsequent to additional cytologic follow-up. From the 43 histologic follow-ups, there were 22 negative cases, 5 CIN1 cases, 4 CIN2 cases, 10 CIN3 cases, 1 squamous carcinoma case and 1 adenocarcinoma case. The year follow-up information on the 147 menopausal atypical squamous cells cases identified from 2000 were 126 (85.72%) negatives, 5 (3.40%) CIN1, 4 (2.72%) CIN2, 10 (6.80%) CIN3, 1 (0.68%) squamous carcinoma and 1 (0.68%) adenocarcinoma.

CONCLUSION: A cytologic finding of atypical squamous cells in menopausal women was associated frequently with typical atrophic changes and infrequently with precancerous or cancerous changes. The current CCSP management guideline of cytologic follow-up after a course of topical conjugated estrogen cream or equivalent for menopausal women with atypical squamous cells appears to be an appropriate recommendation.

From the British Columbia Cancer Agency, Vancouver, British Columbia, Canada.

P-059 SMALL CELL CARCINOMA OF UTERINE CERVIX: THE COMPARISON OF CYTOLOGY FINDINGS OF CONVENTIONAL AND LIQUID-BASED PAP SMEARS

Huang Lung-Cheng, Chu Pei-Yi, Chen Chiung-Ju and Lee Chin-Cheng

OBJECTIVE: To describe and compare the conventional and liquid-based preparation (Manual Liqti-PREP) cytology findings of small cell carcinoma of uterine cervix (SCCUC), with histologic correlation and immunocytochemical staining.

METHOD: We compared the conventional, liquid-based preparation cytology and histologic features of SCCUC occurring in a 45-year-old female at Shin Kong Memorial Hospital, Taiwan, in 2006. And immunocytochemical staining was employed on cytologic liquid-based specimen.

RESULTS: The cytologic examination of both conventional and liquid-based preparation showed many malignant small cells, arranged either in nests or individually. These were pleomorphic
nuclei varying from round to angular with intensely hyperchromatic; finely granular chromatin pattern and very high nuclear to cytoplasmic ratio; irregular nuclear membrane; very scanty, delicate cytoplasm; and inconspicuous nucleoli. Although tumor diathesis included apoptotic bodies, nuclear dust and anuclear cellular debris were obvious in the background in the conventional Pap smear. However, the liquid-based Pap smear revealed more tumor cells than the conventional smear. Nuclear molding, tumor cell cannibalism, mitotic figure and cell clumps were more conspicuous in the liquid-based Pap smear. Histologic examination of cervical biopsy disclosed a typical picture of small cell carcinoma associated with common mitotic figures, tumor necrosis, cell apoptosis, and crushed artifacts. Immunocytochemical staining was positive for synaptophysin and neuron specific enolase and negative for chromogranin A, CD56 and cytokeratin, which was identical with immunohistochemical staining.

CONCLUSION: It is important to differentiate SCCUC from other cervical cancers due to highly frequent metastasis in an early stage and good response to chemotherapy in this rare entity. However, morphologic features, cytopathology and histopathology play an important role in making an accurate diagnosis in this disease. And the liquid-based cytology shows better cytomorphologic features than conventional smears, due mainly to higher cellularity, absence of smearing effect and better cellular preservation. Furthermore, immunocytochemical staining can offer additional useful assistance in diagnosis of SCCUC.

From the Department of Pathology and Laboratory Medicine, Shin Kong Wu Ho Su Memorial Hospital, Taiwan.

P-060 CONSERVATIVE TREATMENT WITH COLD KNIFE CONIZATION FOR EARLY CERVICAL NEOPLASIA

Y. Matsuura, R. Urabe, T. Kawagoe, N. Toki, T. Hachisuga and M. Kashimura

During the 22 years from 1984 to 2006, cold knife conization was performed in 390 patients with early cervical neoplasia proven by punch biopsy. We followed up 214 patients without definitive treatment after conization. Following conization, hysterectomy was performed in 156 patients because of positive surgical margin in the specimens, positive endocervical curettage (ECC) or occult invasive cancer (21 patients). Residual disease was seen in 25 of 26 patients with positive surgical margin and positive ECC and was noted in 47 of 90 patients with positive margin and negative ECC. Furthermore, residual lesion was seen in only 3 of 21 patients with negative margin and negative ECC. Negative predictive values (NPVs) of surgical margin and ECC were 84% and 55%, respectively, and positive predictive values (PPVs) of surgical margin and ECC were 62% and 88%, respectively. Cytologic examination intervening conization and hysterectomy was invalid for the evaluation of residual disease (PPVs, 89%; NPV, 60%). Abnormal cytology was detected in 23 of 212 patients (11%) treated with therapeutic conization in the follow-up period, but 20 of 23 patients had negative cytology at the final visit. Of 212 patients, 3 (1.4%) had an abnormal cytology at the final visit. Abnormal vaginal cytology was detected in 3.8% of patients (6 of 156) with hysterectomy, and 1 of 156 patients (0.6%) had abnormal cytology at the final visit. Cytologic findings of human papillomavirus (HPV) infection was observed in 67% of patients with abnormal cytology after treatment. HPV DNA was continued in 40% of patients with therapeutic conization, but was disappeared in almost patients with hysterectomy. Conservative procedures such as conization are fully acceptable in patients who preserve reproductive function, but careful long-term follow-up with cytology is recommended. HPV DNA check might be useful for management of early cervical neoplasia after conservative treatment.

From the Department of Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.

P-061 EVALUATION OF ENDOMETRIAL SMEARS BASED PRIMARILY ON CYTOARCHITECTURE

H. Nakajima, A. Inoue, M. Fujita, K. Yokoyama and A. Tatebe

OBJECTIVE: To improve the diagnostic precision of endometrial cytology, we compared endometrial smear diagnosis based on cellular atypia with that of a newer method based primarily on cytoarchitecture of tissue fragments, using the method previously described by Norioka et al.

MATERIALS AND METHODS: We selected 20 cases of normal proliferative endometrium (NPE), 39 cases of endometrial hyperplasia without atypia (EH) and 29 cases of endometrioid adenocarcinoma (EA). Cases of severe cellular atypia were excluded. All cases were reviewed histologically. We compared the accuracy of the endometrial cytologic diagnosis based on the cellular atypia to that based on cytoarchitecture. Based on cytoarchitecture, 4 types were defined: tube or sheet-shaped normal, dilated/branched: simple abnormal, papillo-tubular, complex abnormal, irregular protrusion: complex abnormal. We then calculated the appearance ratio of each type in each lesion.

RESULTS: In both EH and EA, the correlation between histologic diagnosis and cytologic diagnosis based on cytoarchitecture was higher than that between the histologic diagnosis and the cellular atypia-based method (EH: 64% cytoarchitecture, 21% cellular atypia; EA: 90% cytoarchitecture, 62% cellular atypia). In NPE, 3.4% of the cell clumps were abnormal and all of them were simple. Of the 17.6% found in the EH samples, almost all (16.1%) were simple. In EA, 81.1% of the cell clumps were abnormal and almost of them were complex (papillo-tubular 5.6%, irregular protrusion 72.9%).

CONCLUSION: The cytoarchitecture-based method appears to provide substantially better histologic correlation than the cellular atypia-based method. Moreover, it is a valuable tool in the assessment of endometrial lesions, particularly when differentiating between EH and EA.

From Matsushita Memorial Hospital, Osaka, Japan.

P-062 EFFECTIVENESS OF THE SUREPATH LIQUID-BASED PREPARATION IN PERITONEAL WASHING CYTOLOGY IN GYNECOLOGIC MALIGNANCY


OBJECTIVE: Peritoneal washing cytology (PWC) is a significant factor of tumor stage in gynecologic malignancy. In this study, we attempt to compare the diagnostic performance of conventional cytospin (CS) smear with SurePath liquid-based cytology (LBC) in a
RESULTS: Eleven cases (35.4%) were diagnosed as positive for malignancy in both LBC and CS. Of 11 abnormal cytology samples, a more definitive diagnosis of malignancy was rendered by LBC in 3 and by CS in 2 cases. Three cases that were diagnosed as negative for malignancy in CS revealed a few atypical cells in LBC. Tumor cells in LBC were present as cell balls or papillary clusters rather than individual cells in most cases. Necrotic materials mixed with atypical cells in LBC were found in almost abnormal cytology samples (9 cases) and have diagnostic importance. LBC demonstrated better nuclear chromatin morphology, more uniform distribution of cells, better cellularity of atypical cells and more concentrated screening field. The SurePath method showed easier and less time-consuming evaluation of cytomorphologic features and appeared to be more useful in diagnosing the suspicious cases. Moreover, it offered the possibility of adjunctive immunohistochemistry on the same sample.

CONCLUSION: Although LBC was superior to CS in most cases, the application of both methods may be helpful in selected cases in which the LBC diagnosis is not conclusive.

From Cheil General Hospital, Sungkyunkwan University School of Medicine, Seoul, Korea.

063 NEW MOLECULAR APPROACH TO CERVICAL CYTOLOGY

N. Pavloff and K. Yamamoto

OBJECTIVE: Early detection is the greatest weapon against cervical cancer. Diamics has developed a fully automated system for screening cervical cancer, which includes maintaining the cervical cellular spatial orientation. The co-localization of specific biomarkers for proliferation and apoptosis, along with the preservation of morphologic features, are used as indicators of early dysplasia. This system is comprised of a proprietary collection device (CerCol) and a proprietary molecular assay (C-MAP assay) and a proprietary automated scanner. The entire Diamics system will be less costly than conventional Pap analysis and can be used as “see and treat” in developing countries. In this study, our objectives were to evaluate the effectiveness of the collector to obtain a fractional histologic sample (clusters of cells from the ectocervix and endocervix), to determine C-MAP sensitivity and specificity and to correlate C-MAP results with Pap results in the same specimen.

MATERIALS AND METHODS: Thirty-one cases including 4 cervical, 11 endometrial and 16 ovarian tumors were prepared during a 3-month period in May-July 2006 at Cheil General Hospital. LBC and CS demonstrated similar cellular yield in the majority of cases. Abnormal cases were applied by immunohistochemical stainings for calretinin and epithelial membrane antigen (EMA). CerCol collector, the process and the reagents for the C-MAP assay. We are entering our final development phase of looking for correlations among our detection system for screening cervical samples and biopsy results from patients.

From Diamics, Novato, California, and Clarient, Aliso Viejo, California, U.S.A.

P-064 CLINICAL EVALUATION OF A NEW LIQUID-BASED CYTOLOGY TECHNIQUE: LIQUI-PREP SYSTEM

S. Rangaeng, J. Settakorn, N. Preechaphornkul, K. Kritvatcharanun, S. Nateewatana, S. Siriuankul, S. Khooamornphong and J. Srisomboon

OBJECTIVE: To assess the clinical utility of a new liquid-based cytology (LBC) system, Liqui-PREP™ that requires no expensive capital equipment and to compare its results with those of conventional Pap smear.

MATERIALS AND METHODS: A total of 1,030 (776 with normal risk and 254 with high risk) were included in this ethical committee–approved study. A split-sample method was assigned for all sample collections. Following cervicovaginal sample collections by Cervex brush, conventional Papanicoaloa smear slides were obtained. The collection devices with residual cells were then placed into preservative fluid that was subsequently sequenced for Liqui-PREP™ technique. Slides from both conventional and Liqui-PREP™ systems were read independently by 2 cytopathologists. Management for women with abnormal smears will be based on results from those of conventional smears.

RESULTS: Out of 1,030 samples, 50 were interpreted as unsatisfactory by either method and excluded from analysis. Of 980 samples, 851 (86.86%) showed diagnostic agreement between both methods. Among the conventional smears (CS), 18 (1.8%) were categorized as low-grade squamous intraepithelial lesion (LSIL) and 19 (1.9%) were assigned as high-grade squamous intraepithelial lesion (HSIL). Among Liqui-PREP™ slides (LP), 24 (2.4%) were diagnosed as LSIL and 23 (2.3%) were interpreted as HSIL. Only a single HSIL case (5.2%) diagnosed by CS was interpreted as negative by LP while 5 HSIL cases (21.7%) assigned by LP were interpreted as negative (2), atypical squamous cells (2) and LSIL (1). There was a marked discrepancy in the group of atypical squamous cells categorized by both methods. Eighty five cases were assigned by CS as atypical squamous cells (ASC), and 51 ASC cases were interpreted by LP. Of 85 ASC cases demonstrated by CS, 67 (78.8%) were categorized as negative while 8 (9.4%) were assigned as SIL (6 LSIL and 2 HSIL) by LP. Of 51 ASC cases interpreted by LP, 39 (76.4%) were diagnosed as negative and 2 (3.9%) cases were classified as LSIL by CS. Two cases of invasive squamous cell carcinoma were classified by either method. Nonetheless, only 1 such case obtained agreement by their counterparts.

CONCLUSION: Despite bias from split-sample design of slide preparation that favored conventional smears, the Liqui-PREP™ system seemed to increase the detection rate of both LSIL and HSIL. Like other published data, ASC posed most diagnostic discrepancy. Although the system offered better preservation and improved cell visualization, its simplicity for slide preparation and relatively low cost had provided an alternative technique for LBC that would most benefit women who were unable to afford more expensive technologies.

From the Departments of Pathology and Obstetrics and Gynecology, Facul-
ty of Medicine, Chiang Mai University, Bangkok; and AIDS Control Center, Region 10, Thailand.

P-066 RECOGNITION OF ENDOMETRIAL UTERINE PAPILLARY SEROUS CARCINOMA IN LIQUID-BASED PAP TESTS

J. Sherman, T. St. John and G. Leiman

OBJECTIVE: Although not completely sensitive for detection of endometrial lesions, cervical Pap tests frequently provide the initial diagnosis of endometrial cancer (EC). Uterine papillary serous carcinoma (UPSC) is a high-grade variant of EC, accounting for < 10% of endometrial cancers, but for 50% of recurrences. We could find no description of this subtype as seen in thin-layer cytologic samples, and undertook a morphologic comparison of classic EC with UPSC.

METHOD: Ten proven examples each of EC and UPSC Thin-Prep slides were retrieved and examined by 2 observers for 24 morphologic criteria on routine light microscopy. The criteria comprised background, architectural, cytoplasmic and nuclear details.

RESULTS: The distinction between classic EC and USPC was found to be possible and practical on morphologic grounds. USPC was characterized by exfoliation papillary aggregates (n = 10 vs. 0 in EC) or smaller clusters of markedly enlarged cells (n = 9 vs. 1) with pale or vacuolated cytoplasm (n = 7 vs. 2), round to oval nuclei (n = 9 vs. 3), fine chromatin (n = 6 vs. 2) and prominent nucleoli (n = 9 vs. 2), which were often multiple. In contrast, classic EC was seen as an exfoliation of 3-D irregular clusters of smaller cells with minimal granular cytoplasm, hypochromatic round to squared nuclei (n = 10 in EC vs. 0 in USPC) and few to absent nucleoli. Phagocytosis of neutrophils (n = 5) and cell in cell configurations (n = 4) were seen in EC cases only. Background features such as blood and necrotic debris were not useful distinguishing features.

CONCLUSION: The clinically important distinction between EC and USPC can be accomplished easily on routine thin-layer Pap tests prepared by ThinPrep methodology, with attention to basic morphologic criteria involving architectural, cytoplasmic and nuclear detail. Cytopathologists can contribute considerably to management by making this distinction in Pap tests.

From the University of Vermont, Burlington, Vermont, U.S.A.

P-067 SELF-RAPID RESCREENING AS A NEW OPTION FOR INTRALABORATORIAL CYTOLOGIC DIAGNOSIS CONTROL

S. Luzia, S. U. Yamamoto, Neuzi Kasumi Shirata, Sônia Maria M. Pereira, Luzia S. U. Yamamoto, Yuriko Ito Sakai, Luciana Silva Aguiar, Gislene Mitsue Namiyama, Daniela Estilinger, Míria Dall’Agnol and Maria da Gloria Mattosinho de Castro Ferraz

The internal quality control for cytologic diagnoses in the Cytology Laboratory, Adolfo Lutz Institute, São Paulo, Brazil, includes 10% R and a second examination in cases selected using a list of clinical information/cytologic abnormality criteria (which also includes all presumed cervical lesions). The purpose of this study was to assess the efficacy of the 100% self-RR (s-RR, where the same professional who has made the primary examination re-screens his or her own cases) as an internal cytologic diagnostic quality control option for those cases previously classified as negative and to compare the efficacy of this method with the traditional 100% RR. We arbitrarily selected the period between August and September 2006 to perform this study, and a total of 4,599 cases of gynecologic cytology were examined. From these cases, 433 (9.4%) were reevaluated by 10% R and 635 (13.8%) by the guide list. The remaining 3,531 (76.8%) negative cases were submitted to both s-RR and RR using the “1 minute-Turret” method. Independent cytopathologists reviewed a total of 468 (13.2%) cases selected by both s-RR and RR.

METHODS: A total of 41% (192 of 468) by s-RR and 39% (236 of 468) by RR were examined. Final diagnoses were made by consensus by 2 cytopathologists. The cases previously classified as “negative” were considered unsatisfactory in 10.8% (6 cases selected by both s-RR and RR), 20.8% (10 cases by s-RR), and 41.7% (20 cases by RR). False negative results were 10.8% by s-RR (3 high-grade atypical squamous cells [ASC-H] and 1 typical squamous cells of undetermined significance [ASC-US]) and 16.7% by RR (4 ASC-H, 3 ASC-US, 1 low-grade squamous intraepithelial lesion [LSIL]). Our results did not show significant differences between the s-RR and RR methods. The s-RR method can be considered as an option to reduce false negative rates of primary screening. However, both s-RR and RR are time consuming and depend on concentration, observers’ skills and previous experience with RR methods.

From the Adolfo Lutz Institute and Federal University of São Paulo, São Paulo, Brazil.
HSIL. Only 6 (16.2%) of the ASCUS and 4 (18.1%) of the ASC-H cases had biopsy-proven intraepithelial lesions. These data show the importance of a proper follow-up for the patients with ASC results with a new colposcopic procedure, once there are significant limitations of morphologic and visual assessment on cytologic diagnosis and the lesion site may not be attempted on the first biopsy sample.

From Adolfo Lutz Institute and Federal University of São Paulo, São Paulo, Brazil.

P-070 STRATEGIES FOR QUALITY CONTROL IN GYNECOLOGIC CYTOLOGY DIAGNOSIS: PERFORMANCE OF 3 METHODS IN A PUBLIC HEALTH LABORATORY


OBJECTIVE: The objective was to evaluate the performance and the viability of the internal quality control (QC) strategies in a public health laboratory in the State of São Paulo, Brazil.

MATERIALS AND METHODS: This retrospective study focused on 3 different QC strategies to avoid false negative (FN) results. The methods were morphologic guide list criteria (MGLR), 100% rapid rescreening (RR) of negative slides (“turret” method) and rescreening 10% of negative slides (10% R). Among 4,184 cytologic samples processed at Adolfo Lutz Institute, São Paulo, Brazil, from 2002 to 2004, 1,117 (26.7%) were reviewed by MGLR strategy and the 3,067 negative samples (73.3%) were rescreened by 2 independent pathologists using both RR and 10% R strategies. Histopathologic results, when available, were considered the gold standard; consensus diagnosis was obtained by 2 pathologists when histologic results were unavailable.

RESULTS: MGLR strategy selected 20.7% samples with cytologic atypias to be reviewed; 10% R strategy selected 0.7% and RR strategy selected 2.5% (weighted κ = 0.98). The cytologic or histologic initial concordance was 97.2%. The relative DNA contents in the nuclei with type II nucleoli were larger than that of the 3rd culture day. The nucleoli with irregular shape were frequently observed in the proliferative phase. The N/N ratio in the cells at the 7th and 10th culture days was larger than that of the 3rd culture day. The nucleoli with type II nucleoli (type IV) were identified, single large nucleolus (type I) and multiple small nucleoli (type II). Type II nucleoli were observed in the proliferative phase. The N/N ratio (% ratio of the area of nucleoli relative to that of nucleus) of endocervical glandular cells and analyzed the correlation with cell cycle.

CONCLUSION: Liquid-based cytology samples showed better diagnostic performance in comparison with conventional smears. The 100% RR strategy seems to reduce the false negative results and allows evaluation of the individual performance of the group. The 10% R strategy seems to be important by forcing the screening group to “pay attention.” The revision of samples selected by MGLR allows evaluation of the cytomorphologic criteria. We concluded that the association of MGLR and 100% RR strategies may improve cytologic diagnosis.

From Universidade PPM and Adolfo Lutz Institute, São Paulo, Brazil; and University of Minho, Braga, Portugal.

P-071 LACK OF CERVICAL SCREENING: ASSESSING MAGNITUDE OF THE PROBLEM

D. S. Wamala

Uganda has a high incidence of cervical cancer (23.1%), a major cause of morbidity and mortality in women, yet like any low-resource developing country there is no cervical screening program. An effective screening test must be minimally invasive, inexpensive and reliable. Cytology-based Pap smear is an effective screening strategy. Cervical smears taken from women who presented for routine Pap (71.82%) or with vaginal itching, discharge or bleeding (28.18%) over a period of 2.5 years were screened at Mulago hospital, Uganda, to study the cervical abnormalities. All smears were fixed with 96% alcohol, stained with Pap stain and screened microscopically. The objective was to study the morphologic pattern of cervical abnormalities. Of the smears from 242 women aged 20–81 years (average age 38.08), 13.36% were classified as inadequate. Of the remaining, 59.71% were normal. Dysplastic changes were seen in 40.29% cases, of which 13 cases (6.91%) were classified as atypical squamous cells of undetermined significance (ASC-US), 6 cases (2.84%) were atypical glandular cells (AGCs), 20 cases (9.47%) were low-grade squamous intraepithelial lesions (LSIL), 7 cases (3.31%) were high-grade atypical squamous cells (ASC-H). Thirty-four cases (16.11%) were high-grade squamous intraepithelial lesion and 7 (3.31%) cases had features of microinvasion, both with a high incidence in the fifth and sixth decades. Abnormal vaginal flora was found in 33.85% cases, human papillomavirus (HPV) 17.76%, Gardinerella vaginalis 7.38%, Candida albicans 6.61%, Trichomonas (1.23%) and herpes simplex (0.82%). The results show a high prevalence of high-grade cervical lesions and HPV necessitating a need to plan and institute a national cervical screening program targeting the at-risk group of 30–59 years with high incidence of HSIL.

From the Department of Pathology, Mulago Hospital and Makerere University, Kampala, Uganda.

P-072 MORPHOLOGIC ANALYSIS OF NUCLEOLI WITH ENDOCERVICAL GLANDULAR CELL LINES


OBJECTIVE: There have been many reports in which the appearance of nucleoli is regarded as one of the diagnostic criteria for malignancy of glandular cells; however, consensus has not been established. In the present study, we measured the number of nucleoli and the N/N ratio (% ratio of the area of nucleoli relative to that of nucleus) of endocervical glandular cells and analyzed the correlation between the state of nucleoli and cell cycle.

MATERIALS AND METHODS: Three endocervical cell lines (OMC-4, TMCC-1 and HEN-18S) were used for analysis of nucleoli. For NIH Image Analysis, cultured cells in chamber slides were fixed at the 3rd, 5th, 7th and 10th culture days. After Papanicolaou staining, number of nucleoli and the areas of nucleoli and nuclei were measured. For the measurement of relative DNA contents in nuclei, propidium iodide staining was performed after destaining of Papanicolaou slides. pKi-67 staining was used to know the correlation with cell cycle.

RESULTS: In the analysis of these cell lines, 2 types of nucleoli were identified, single large nucleolus (type I) and multiple small nucleoli (type II). Type II nucleoli were observed in the proliferative phase. The N/N ratio in the cells at the 7th and 10th culture days was larger than that of the 3rd culture day. The nucleoli with irregular shape were frequently observed in the proliferative phase. The relative DNA contents in the nuclei with type II nucleoli were higher than those with type I nucleoli, suggesting that morphologic changes of nucleoli would be influenced by cell cycle.
CONCLUSION: It is suggested that the appearance of multiple small and irregular nucleoli might be an indicator of proliferative activity of glandular cells. The findings of our present study would contribute for the diagnosis of endocervical glandular lesions.

From Kyushu University, Fukuoka; and Saga Medical School, Saga, Japan.

P-073 IMMUNOCYTOCHEMISTRY ON LIQUID-BASED CYTOLOGIC PREPARATIONS AS AN ADJUNCT IN FINE NEEDLE ASPIRATION CYTOLOGY OF THE THYROID

L. Thienpont, M. Praet, M. Chosia and G. De Boeck

Fine needle aspiration cytology (FNAC) of the thyroid has become a classic diagnostic tool for diagnosis in thyroid pathology. In many centers, FNAC of the thyroid is now a standard of care in preoperative patient workup. In well-trained hands FNAC of the thyroid has proven to have a high specificity and sensitivity. We routinely use conventional Giemsa-stained FNAC and whenever available and compare them with wet-fixed Pap-stained slides. In a former study based on 76 histologic cases, we found diffuse positivity for HBME1 in follicular carcinoma, papillary carcinoma and Hürthle cell carcinoma. CK19 proved to be a good marker for papillary carcinoma but stained Hürthle cell tumors as well.

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<th>76 Histologic cases</th>
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<td>Gal3 3/4 1/10 1/4 6/10</td>
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Positive staining by these markers in adenoma and goiter was only focally observed. In this experiment, 20% of papillary cancers stained positively for RET/PTC and 1 in 6 adenomas and 3 of 5 follicular carcinomas stained for PAX8-PPARG. CK14 proved a good marker for oxyphilic or Hürthle cells. The introduction of liquid-based cytology (LBC) and the use of 1 Tripath Imaging® devices follow the preparation of 4 to 8 “monolayer” preparations that can be routinely Pap-stained and additionally immunostained applying a choice of antibodies such as anti-thyroglobulin, thyrocalcitonin, CEA, parathormone, HBME1, CK20, galectin3, CK14, RET/PTC, and PAX8-PPARG. Stains are performed on Ventana Nexus® and Benchmark® devices. To separate nondiagnostic focal staining from diffuse “tumor-type” staining, staining results are interpreted as positive if > 20% of cells stain positively and as negative if no staining is present or if < 20% of cells stain positively for the immunomarker. Preliminary results reveal that the cytologic findings parallel the histologic observations with expression of HBME1 and Gal3. They are considered as a diagnostic tool in differential diagnosis of benign and malignant follicular tumors. CK19 helps in the diagnosis of papillary tumors. As for oxyphilic or so-called Hürthle cells and tumors, both benign and malignant Hürthle cell tumors may stain positively for HBME1, CK19, Gal3. However, in these tumors a strong positive reaction for CK14 can be expected.

From the Histopathology and Cytompathology Laboratory Onze-Lieve-Vrouw Ziekenhuis, Aalast, and Goormaghtigh Institute of Pathology University Hospital, Gent, Belgium; and Department of Pathology, Pomerian Medical University, Szczecin, Poland.

P-074 NEUROENDOCRINE TUMOR DIAGNOSED WITH FINE NEEDLE ASPIRATION CYTOLOGY IN A PATIENT WITH LINGUAL EPIDERMOID CARCINOMA

J. Rodriguez-Costa, C. Agra, V. Parra and E. Salinero

OBJECTIVE: We present a case report of a 53-year-old woman with lingual epidermoid carcinoma antecedents, who came to our center for a palpable laterocervical nodule and suspected ganglionic metastasis. The cytologic diagnosis demonstrated a neuroendocrine tumor. TC had shown 1 mediastinal tumor (pending study).

MATERIALS AND METHODS: An ancerolaterocervical mass was aspirated by fine needle. The obtained material was stained with Diff-Quik technique.

RESULTS: Cytologic examination showed high-density cellular extensions isolated or in small clusters cells with round nuclei with a granular, thin chromatin and very scarce cytoplasm. These findings suggest a probable neuroendocrine origin.

From HGU Gregorio Maraion, Madrid, Spain.

P-075 FINE NEEDLE ASPIRATION CYTOLOGY OF LOW-GRADE CRIBRIFORM CYSTADENOCARCINOMA OF THE PAROTID GLAND

M. M. Garcia-Bonafe, M. M. Company and P. Huguet

OBJECTIVE: Low-grade cribriform cystadenocarcinoma (LGCCC) is a recently described entity, defined in the last classification of the World Health Organization to describe low-grade salivary duct carcinomas or low-grade intraductal salivary carcinoma. The cytologic characteristics of LGCCC have not been described.

MATERIALS AND METHODS: We report a case of a 44-year-old man with a palpable mass in the right parotid gland. Magnetic resonance imaging demonstrated a cystic lesion with a septum and areas with mucinous signal intensity. Fine needle aspiration (FNA) was performed.

RESULTS: The smears showed macrophages, mucinous material and necrotic debris. The cells were arranged in pseudopapillary groups or monolayer sheets. A double cell component was found: the first with inconspicuous cytoplasm and the nuclei exhibiting a pale chromatin, irregular membrane and small nucleoli. The second type was constituted by polygonal cells with clear or vacuolated cytoplasm. Our differential diagnoses included metastases of thyroid papillary carcinoma (due to the features of the nuclei), cystadenoma or cystadenocarcinoma (because of the cystic content of the smears) and low-grade mucoepidermoid carcinoma. Histologically the tumor was a LGCCC. Cystic spaces with ductal epithelium and apocrine differentiation cells with micropapillary and cribriform pattern were seen. The cellular atypia were low, with foci of stromal necrosis and diffuse “tumor-type” staining, staining results are interpreted as positive if > 20% of cells stain positively and as negative if no staining is present or if < 20% of cells stain positively for the immunomarker. Preliminary results reveal that the cytologic findings parallel the histologic observations with expression of HBME1 and Gal3. They are considered as a diagnostic tool in differential diagnosis of benign and malignant follicular tumors. CK19 helps in the diagnosis of papillary tumors. As for oxyphilic or so-called Hürthle cells and tumors, both benign and malignant Hürthle cell tumors may stain positively for HBME1, CK19, Gal3. However, in these tumors a strong positive reaction for CK14 can be expected.

CONCLUSION: The current case revealed the difficulty of the cytologic diagnosis of LGCCC. In FNA material we must distin-
P-076 FINE NEEDLE ASPIRATION OF PARATHYROID GLANDS: PROBLEMS IN DIAGNOSIS

M. Halbauer, H. Tomic Brzac and Lj Fustar-Preradovic

Parathyroid lesions are frequently treated as a disease of the thyroid, thus presenting a serious diagnostic problem. The preoperative localization of abnormal, nonpalpable parathyroid glands in patients with primary or secondary hyperparathyroidism is largely dependent on use of high-resolution sonography. However, such a technique has some limitations and the aid of fine needle aspiration biopsy (FNAB) may be relevant. On the other hand, cytology also has some limitations in identification of parathyroid cells, with particular reference to differential diagnosis from thyroid cells. The accuracy of diagnosis of suspected enlarged parathyroid glands can be improved by combination of ultrasound examination, ultrasound-guided FNAB and simultaneous analysis of the biopsy material not only by cytology, cytochemistry and immunocytochemistry, but also for parathyroid hormone determination and histology, as necessary. A systematic morphologic description will be given in stained smears with all cell types and their cytomorphic presentation, with the use of Grimelius cytochemistry and immunocytochemistry.

From the Department of Nuclear Medicine and Radiation Protection, Zagreb University Hospital Center, Zagreb; Department of Pathology, Forensic Medicine and Cytology, General Hospital, Slavonski Brod, Croatia.

P-077 EVALUATION OF GUIDELINES OF REPORTING FOR SALIVARY GLAND ASPIRATION CYTOLOGY


OBJECTIVE: We evaluated the guidelines of reporting for salivary gland aspiration cytology proposed by Hirokawa et al in 2004, to verify its usefulness in the cytologic diagnosis of salivary gland lesions.

STUDY DESIGN: We reviewed 305 specimens, including 198 operated cases sent as fine needle aspiration (FNA) samples of major salivary glands from 3 hospitals. We first classified the cases into adequate or inadequate specimens and then reclassified the adequate specimens into four cytologic categories: benign, indeterminate, suspicious of malignancy and malignant.

RESULTS: The ratio of inadequate specimens was 16.7%. Although it was higher than the upper limit (10%) expected, the ratio in specimens with both Papanicolaou and Giemsa stains was as low as 5.7%. The ratio of indeterminate in adequate specimens was 10.9% and almost the same as the upper limit (10%). The ratio of true malignancy in suspicious specimens was 100% and higher than the lower limit (70%). More than 80% of the lesions included in indeterminate were those expected in the proposal.

CONCLUSION: We conclude that the proposal is suitable and useful in cytologic diagnosis of the salivary gland.

From the Department of Pathology, Chang Gung Memorial Hospital, Taoyuan, Taiwan.

P-078 FINE NEEDLE ASPIRATION CYTOLOGY OF THE SALIVARY GLAND NEOPLASMS: CYTOLeOGIC AND HISTOLOGIC CORRELATION

S. M. Jung

OBJECTIVE: To evaluate the usefulness and accuracy of fine needle aspiration cytology (FNAC) in the diagnosis of salivary gland neoplasms.

MATERIALS AND METHODS: We retrospectively reviewed the FNAC and pathology files of the department of pathology at a medical center from 1998 to 2004.

RESULTS: There were a total of 242 excisional specimens of salivary glands neoplasms with previous diagnosis of FNA. They included 162 pleomorphic adenomas, 51 Warthin’s tumors, 4 monomorphic adenomas, 2 oncocytomas, 14 mucoepidermoid carcinomas, 9 adenoid cystic carcinomas, 7 acinic cell carcinomas, 1 salivary duct carcinomas and 2 metastatic carcinomas. The sensitivity of FNAC was 91.6% and the specificity was 98.2%. The positive predictive value was 59.2% and the negative predictive value was 96.5%. Eight cases (3 mucoepidermoid carcinomas, 1 adenoid cystic carcinomas and 2 acinic cell carcinomas) were mistaken for pleomorphic adenoma. The diagnostic pitfalls between pleomorphic adenomas and these entities were small cell clusters, squamous metaplasia, cystic degeneration, mucoid stroma and clear cell change.

CONCLUSION: FNAC is a useful tool in the initial assessment of salivary gland neoplasm. Review of these cases identified sources of diagnostic errors and provided clues in reaching a correct diagnosis.

From the Department of Pathology, Chang Gung Memorial Hospital, Taoyuan, Taiwan.

P-079 ENTAMOEBA GINGIVALIS IN A LIQUID-BASED CERVICAL SAMPLE

D. N. Rana, M. A. Lynch, S. E. M. Whitehead, N. Ashton and M. S. Desai

OBJECTIVE: To report a case of Entamoeba gingivalis infection in a ThinPrep liquid-based cervical cytology (LBC) sample.

MATERIALS AND METHODS: A 38 year old female underwent a cervical smear. The clinical history indicated that an intrauterine contraceptive device (IUCD) was in place. No abnormal squamous or glandular cells were present. A ThinPrep LBC sample was obtained and examined.

RESULTS: In the background of the smear and in association with Actinomyces-like organisms were numerous trophozoites consistent with E. gingivalis. The organisms measured 15–60 μm, with pale, granular, cyanophilic cytoplasm. The nucleus (3–4 μm) appeared round with peripheral chromat granules and a karyosome. All organisms contained round, darkly staining cytoplasmic inclusions consistent with ingested remnants of degenerated leukocytes within food vacuoles. Observations of amoebic trophozoites in the female genital tract are uncommon. A study in 1980 of cervical smears.
in IUCD users demonstrated that 8.6% of patients with *Actinomyces* infection harbored amebae. In our experience this figure is lower. To our knowledge these organisms have not previously been described in LBC preparations. There are four species of *Entamoeba* that parasitize humans: *E. coli*, *E. gingivalis*, *E. hartmanni* and *E. histolytica*. *E. hartmanni* organisms are smaller than *E. gingivalis*. *E. coli* has coarser peripheral chromatin, coarser and more vacuolated cytoplasm with a larger endosome. *E histolytica* is smaller than *E gingivalis* and contains a coarser endosome and food vacuoles containing red blood cells. On the basis of size and nuclear, endosomal and cytoplasmic vacuolar appearance, we are confident that the organisms in this case represent *E. gingivalis*.

**CONCLUSION:** *E. gingivalis* is a commensal organism in the human oropharynx. Spread to the genital tract occurs by orogenital contact. In our experience, these organisms are less frequently seen than previously reported. The features in ThinPrep LBC samples are well preserved and the organisms are readily recognizable.

From Central Manchester and Manchester Childrens University Hospital, National Health Service Trust, Manchester, U.K.

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**P-080 UNREPORTED CYTOLOGIC CHARACTERISTICS OF EPITHELIAL CELLS OF WARTHIN’S TUMORS**

C. C. Su, C. F. Li and C. N. Lin

**OBJECTIVE:** Some Warthin’s tumors can contain markedly atypical or degenerated oncocytes and have been mistaken for malignancies. Our purpose was to identify the characteristic features of Warthin’s tumor oncocytes to decrease the rate of false diagnosis.

**MATERIALS AND METHODS:** The clinical and pathologic features of 45 Warthin’s tumors were reviewed. Of them, fine needle aspirates from 13 patients were stained with Papanicolaou and Diff-Quik stains and examined.

**RESULTS:** The male-to-female ratio (21:34) was exceedingly high and the highest reported to the best of our knowledge. Only 15 patients had a definite smoking history. Diff-Quik-stained slides revealed sheets or clusters of the oncocytes with nuclei containing uniform, eccentric and single pinpoint nucleoli arranged in the same plane.

**CONCLUSION:** These cytologic characteristics that we have not found in other lesions with oncocytes may improve the accuracy of diagnosing Warthin’s tumor.

From Buddhist Dalin Tzu Chi General Hospital, Chia-Yi; and Chi-Mei Foundation Medical Center, Yungkang, Taiwan.

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**P-081 SALIVARY GLAND FINE NEEDLE BIOPSY AT THE BRITISH COLUMBIA CANCER AGENCY: 1995–2003**

B. Smith, M. Kurlak, A. Sabarre, Z. Edgar and T. Thomson

**OBJECTIVE:** To perform an educational and quality assurance review of performance.

**METHODS:** Cases of in-clinic fine needle aspiration biopsies (FNABs) from 1995–2003 were reviewed. Outcome reports were retrieved from files or by letters to physicians.

**RESULTS:** Overall of 798 SG FNABs, 363 (45%) had biopsy (225) or clinical (138) follow-up. Cytology interpretation was benign (238), malignant (73), atypical (18), suspicious (19) and nondiagnostic (15). Of the 225 biopsies, 71 were cytology-malignant, 121 benign, 11 atypical, 18 suspicious and 4 nondiagnostic. Of 71 cytology-malignant, 70 were biopsy-malignant; 30 were metastatic carcinomas, 24 lymphomas (non-Hodgkin’s lymphoma [NHL]), 7 carcinoma–not otherwise specified (NOS), 3 adenoid cystic (ACC), 3 mucoepidermoid (MEca) and 3 acinic. One cytology-malignant case was pleomorphic adenoma (PA), an interpretative error. Of 121 cytology-benign cases, 108 were biopsy-benign (54 PAs, 23 Warthin’s tumors, 7 reactive lymph nodes [RLN], 7 inflammatory-NOS, 5 benign SGs, 4 monomorphic adenomas, 3 oncocytes, 3 cysts, 2 SG lesion–other) and 13 malignant (6 NHLs, 2 ACC, 1 each acinic cell, MECA, lymphoepithelial carcinoma, myoepithelial carcinoma and adenocarcinoma [Adca]). Eleven cytology–atypical were identified: 5 biopsy-malignant (2 NHLs, 2 Hodgkin’s lymphomas, 1 MECA) and 6 biopsy-benign (1 each chronic sialadenitis, pilomatrixoma, schwannoma, nodular fascitis, meningioma, RLN). Of 18 cytology-suspicious cases, 15 were biopsy-malignant (8 lymphomas, 2 metastatic squamous cell carcinomas, 1 each metastatic Adca, Adca, ACC, angiosarcoma, carcinosarcoma) and 3 were biopsy-benign (monomorphic adenoma, RLN, chronic sialadenitis). Of 4 cytology-nondiagnostic, 3 were biopsy-benign SGs and 1 was an MEca. Most false negatives were interpretative errors; many were difficult on blinded review. Laboratory performance, excluding non-diagnostic, atypical and suspicious cases: sensitivity 84%, specificity 99%, positive predictive value (PPV) 99% and negative predictive value (NPV) 89%. Performance combining suspicious with malignant, excluding nondiagnostic and atypical cases: sensitivity 87%, specificity 96%, PPV 96% and NPV 89%.

**CONCLUSION:** FNAB performance was comparable to that in other studies. Review was valuable, highlighting areas of diagnostic and reporting difficulty.

From the British Columbia Cancer Agency, Vancouver, British Columbia, Canada.

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**P-082 ENDOBRONCHIAL SIALADENOMA: A CASE REPORT**


**BACKGROUND:** Primary lung tumors showing features of salivary gland-type neoplasms are extremely rare. Sialadenoma papilliferum is a rare tumor that has mostly been described in minor salivary glands of the mouth.

**CASE:** A 52-year-old woman presented with chest pain. Chest radiographs showed a radiopaque lesion in right upper lung field. Computed tomography (CT) scan of the chest revealed an area of bronchial thickening and nodule in right S3. Bronchoscopy was undertaken for an abnormal CT scan and endobronchial tumor was apparent at right B3h. The bronchus was obstructed by a lobulated tumor.

**CONCLUSION:** Biopsy revealed adenoma in background of dense fibrous tissue. Preoperative diagnosis was considered as adenoid cystic carcinoma or pleomorphic adenoma. Resection was performed by rigid bronchoscopy under general anesthesia. Slides were stained routinely with Papanicolaou technique. Touch cytology revealed acinus-like cluster composed of central larger epithelial cells and peripheral small bipolar cells. The papillary tumor showed histologically complex papillary structures protruding into the bronchial lumen. The papillae were lined by a double row of cells, consisting of a nonciliated columnar epithelial cells and a basal layer.
MATERIALS AND METHODS: a mass lesion. Accuracy and adequacy of fine needle aspiration (FNA) in human immunodeficiency virus (HIV)-positive children who present with a mass lesion.

RESULTS: Head and neck masses were the most common presentation (58.9%), followed by axillary masses (25.3%). Six children had groin masses, 4 had flank and abdominal masses, 3 presented with buttock masses, 1 had a chest wall mass and 1 underwent a sonar-guided FNA of a lung mass. Eight FNA (8.4%) proved inadequate. Reactive lymphadenopathy was diagnosed in 42 cases, mycobacterial infection in 22 and abscess in 4. One child had a fungal infection, 5 had non-Hodgkin’s lymphoma, 4 were diagnosed with lymphoepithelial lesion and 4 with Kaposi’s sarcoma. There was 1 case each of nephroblastoma, rhabdomyosarcoma, myeloma, melanotic progonoma and spindle cells, not otherwise specified.

CONCLUSION: FNA in HIV-positive children is a worthwhile procedure and in most instances allows a rapid diagnosis without the need for surgery and enables swift treatment to be undertaken where necessary. Ancillary studies form an important diagnostic component. Universal safety precautions must be strictly adhered to.

From the National Health Laboratory Service, Chris Hani Baragwanath Hospital, and University of the Witwatersrand, Johannesburg; and National Health Laboratory Service and University of Stellenbosch, Cape Town, South Africa.

P-085 NONISOTOPIC IN SITU HYBRIDIZATION LINKED TO THE PEROXIDASE AND ALKALINE PHOSPHATASE METHOD FOR THE DETECTION OF CHROMOSOMAL ABNORMALITIES USING CONVENTIONAL MICROSCOPY

S. Hiroi, K. Nakamichi, S. Tominaga, A. Suzuki and T. Kawai

OBJECTIVE: It is well known that chromosomal abnormalities are seen in many tumors. Fluorescence in situ hybridization (FISH) is one of excellent methods in searching chromosomal abnormalities. Cytologic specimens are suitable in observation of the chromosomal abnormalities per 1 tumor cell. It is difficult to observe cell morphology by the FISH method, because FISH stains only nuclei. The method of stained nuclei by hematoxylin (Papanicolaou) with conventional light microscopy is useful for observing cell morphology. We established the staining methods for nonisotopic in situ hybridization linked to the peroxidase and alkaline phosphatase method for the detection of chromosomal abnormalities using conventional light microscopy.

MATERIALS AND METHODS: We used imprint cytologic specimens from lung carcinomas and biotinylated- and digoxigenin-labeled probes for the p53 gene and centromeric region of chromosome 17. After hybridization, the examination of signal (biotin and digoxigenin) detection methods using labeled streptavidin-biotin technique (LSAB), avidin-biotinylated peroxidase complex (ABC), catalyzed signal amplification (CSA) methods, alkaline phosphatase–labeled antidigoxigenin and alkaline phosphatase amplification method used carried out. Diaminobenzidine tetrahydrochloride (DAB) and New Fuchsin were used as chromogen. The slides were counterstained with Papanicolaou. And these results were compared with the FISH.

RESULTS: ABC and alkaline phosphatase amplification method were strongly detected chromosomal signals. But the signals were weak in LSAB- and alkaline phosphatase–labeled antidigoxigenin and were spread in CSA. The specimen counterstaining by Papanicolaou was excellent in observation of morphology. Signals counted by ABC and alkaline phosphatase amplification method were much the same as those obtained using FISH.

CONCLUSION: The method of detecting biotinylated and digoxigenin-labeled probes by ABC and alkaline phosphatase amplification method and performing counterstaining by Papanicolaou is excellent not only in detecting chromosomal signals, but also in observing cell morphology.
P-086 IMMUNOCYTOCHEMICAL EXPRESSION OF APOPTOTIC AND PROLIFERATING MARKERS IN HeLa CELLS AFTER INFECTION WITH INFLUENZA A VIRUS

D. Sioutopoulou, R. Valeri, L. Kampas, E. Plakokefalos, C. Destouni and N. Vamvakopoulos

OBJECTIVE: Nowadays, cancer cell lines are being used in the research field, in order to be investigated possible ways of malignant transformation. The purpose of this study was to investigate the cytormorphologic and the oncogenic differentiation status of malignant HeLa cells, infected by influenza A virus, a nononcogenic human and animal respiratory pathogen, in comparison with non-infected controls.

MATERIALS AND METHODS: We infected HeLa cells with increasing influenza type A viral titers and examined morphologic changes in correlation with expression of apoptotic (caspase 8, caspase 3) and proliferating (Ki-67, cyclin E) tumor markers. Both control and infected HeLa cells were processed by ThinPrep technique and stained by Papanicolaou method. Immunofluorescence for detection of viral specific antigen expression and immunocytochemistry were followed.

RESULTS: Microscopic evaluation revealed thatThinPrep smears from infected HeLa cells differed from their noninfected controls in the following ways: (1) reduced number of cells per optical field, (2) alteration in cell shape from round to irregular, (3) reduction of nuclear size and nuclear density, (4) overexpression of caspases 3 and 8, (5) reduced expression of Ki-67 and cyclin E. These differences were viral titer dependent in that the higher the titer of the viral stock used in cell infection, the greater was the magnitude of alterations observed.

CONCLUSION: The overexpression of caspases 3 and 8 and the reduced expression of Ki-67 and cyclin E, along with the overall nuclear alteration, suggest that the surviving HeLa cells from influenza type A infection behave like compromised apoptotic variants and deviate from the original malignant phenotypes of their uninfected precursors.

From the Department of Pathology and Laboratory Medicine, National Defense Medical College, Saitama, Japan.

P-087 GLYPICAN-3: COMPARISON OF A NOVEL STAIN IN IMMUNOCYTOCHEMISTRY AND IMMUNOHISTOCHEMISTRY IN HEPATOCELLULAR CARCINOMA

D. Kandil, G. Leiman, W. Trotman, M. Allegretta, L. Pantanowitz, R. Goulart and M. Evans

BACKGROUND: Glypican-3 (GPC3) is a heparin sulfate proteoglycan that shows significant serum elevation in hepatocellular carcinoma (HCC) patients, but not in healthy donors or benign liver disease. GPC3 immunohistochemistry (IHC) is a promising marker of HCC in histologic sections. We have found 90% archival liver fine needle aspirates (FNAs) of HCC to be positive for GPC3, with cytoplasmic accentuation in 70% (unpublished data). In this study, we compare sensitivity and intensity of GPC3 staining in immunocytochemistry (ICC) and IHC.

STUDY DESIGN: Twenty-two archival FNA slides from 11 cases of proven HCC at 2 institutions were retrieved (group A), with the correlating tissue core biopsy and excision specimens (group B). After antigen retrieval, all cases were immunostained simultaneously with appropriate tissue and cell controls. Primary antibody GPC3 and secondary antibody Mouse Envision Polymer were followed by DAB chromogen. The slides were counterstained with hematoxylin, and examined by 2 observers. GPC3 staining intensity and pattern were graded as negative = 0, weak cytoplasmic = 1, moderate cytoplasmic = 2 and strong cytoplasmic with membranous accentuation = 3.

RESULTS: Group A cytoslides had stronger immunoreactivity to GPC3 than group B sections in 36.4% of the cases. Group A showed 0% grade 0/1, 18.2% grade 2 and 61.8% grade 3 staining. Group B resulted in 18.2% grade 0, 0% grade 1, 27.3% grade 2 and 54.5% grade 3. The same staining intensity and pattern in ICC and IHC were seen in the remaining 63.6% of cases.

CONCLUSION: ICC was superior to IHC in 36.4% of cases. Eighteen percent grade 2/3 HCC cases on ICC failed to react with GPC3 in tissue. Our data support the higher sensitivity of GPC3 in cytology as compared to surgical pathology. This further potentiates the value of GPC3 as a reliable tool in FNAs of HCC.

From the University of Vermont, Burlington, Vermont; and Baystate Medical Center, Springfield, Massachusetts, U.S.A.

P-088 IMMUNOCYTOCHEMICAL FEATURES OF TROPHOBLASTIC CELLS


OBJECTIVE: To elucidate the function of trophoblastic cells by the immunocytochemical study.

MATERIALS AND METHODS: The stamp smears were taken from the chorionic villi or placenta. Trophoblastic cells were marked and then reconstituted with immunocytochemical procedures, such as hCG, hPL, PLAP, vimentin and cytokeratin. The Papanicolaou stain method was used to estimate the immunocytochemically positive trophoblastic cells.

RESULTS: The small, polygonal, oval and spindle-shaped trophoblastic cells with thick cytoplasm and clear cell border were positive with hPL, cytokeratin and vimentin. Large syncytiotrophoblastic cells were positive with hCG and small round or oval syncytiotrophoblastic cells without anisokaryosis were positive with PLAP. There were many isolated large, irregularly shaped trophoblastic cells with macronucleoli and immunocytochemically negative staining.

CONCLUSION: The PLAP indicated some variations among the positive staining syncytiotrophoblastic cells which is thought to be the cellular maturation according to the gestation. Many large isolated trophoblastic cells could not be identified for their cellular function.

From the Department of Gynecology, Sinai Medical Corporation, Tenjin Clinic, Tokyo; and Departments of Surgical Pathology and Obstetrics and Gynecology, University of Occupational and Environmental Health, Fukuoka, Japan.
**P-089 FINE-NEEDLE ASPIRATION CYTOLOGY OF KIKUCHI'S LYMPHADENITIS: CYTOLOGIC REVIEW OF 12 CASES**

J. H. Kim, M. K. Shim, Y. D. Choi, J. S. Lee, C. S. Park, S. W. Juhn and J. H. Nam

**OBJECTIVE:** Kikuchi’s lymphadenitis (KL) is uncommon but well-defined clinical entity that typically involves the cervical lymph nodes of young woman. It is benign, self-limited disease of unknown etiology. The purpose of this report was to confirm the cytologic features of KL.

**MATERIALS AND METHODS:** Cytologic smears slides from 12 patients, which were histologically proven to KL, were reviewed. In all cases, fine needle aspiration (FNA) was performed before biopsy. Among various cytologic features, special attention was focused on 4 parameters: cellularity, karyorrhectic debris, histiocytes and necrosis.

**RESULTS:** The smears in all 12 cases were highly cellular, with a polymorphous lymphoid population. Necrosis was not shown in any case. Except for 1 case, neutrophils were not found. Karyorrhectic debris was abundant in 8 cases. They could be observed as intracytoplasmic debris within histiocytes or as extracellular fragments. Histiocytes were a prominent finding in 9 cases. Most of them showed small to moderate size, with eccentrically placed, crescent-shaped nuclei. Among 12 cases, at least 6 cases showed characteristic cytologic findings that made the diagnosis KL. Because 4 cases showed small amount of karyorrhectic debris or small number of histiocytes with crescentic nuclei, these cases were indistinguishable from other nonspecific, reactive lymphadenitis. Epithelioid histiocytes found in 1 case made the differential diagnosis with tuberculous lymphadenitis necessary. In 1 case, cytologic diagnosis as malignant lymphoma was possible due to increased numbers of large immunoblasts.

**CONCLUSION:** High cellularity with a polymorphous lymphoid population, abundant karyorrhectic debris and small-sized histiocytes with eccentrically placed, crescentic nuclei were important cytologic features of KL. When typical cytologic findings are present in an adequate clinical context (cervical node in young woman), a precise diagnosis is possible, avoiding unnecessary biopsies.

From the Department of Pathology, Chonnam National University School, Gwangju, Korea.

**P-090 NEW CYTOLOGIC CLUES IN LOCALIZED LEISHMANIA LYMPHADENITIS: A STUDY OF 170 CASES**

Yahya Daneshbod and Paria Yarahmadi

**BACKGROUND:** To describe new cytologic clues to diagnose localized leishmania lymphadenitis (LL).**

**STUDY DESIGN:** The study consisted of cytologic smears of 170 cases of LL referred to our department from November 1989 to October 2004. A total of 120 cases were confirmed by detecting Leishman-Donovan (LD) bodies in at least 1 of the cytologic smears and 50 cases that were histologically confirmed. For comparison we also studied cytologic smears of 20 cases of tuberculous lymphadenitis, 20 cases of toxoplasma lymphadenitis and 20 cases of granulomatous lymphadenitis of unspecified causes.

**RESULTS:** Cases were divided into 4 major groups: (1) high load of LD bodies, easily diagnosed by microscopic examination; (2) low load of LD bodies, diagnosed by detecting few LD bodies in a limited number of smears; (3) cases with highly suggestive smears but with no typical LD bodies and later histologically confirmed; (4) cases with smears suggestive of reactive or neoplastic processes but diagnosed as leishmania lymphadenitis (LL) after surgical excision.

Cytologic findings in these groups were studied to find highly suggestive clues. Cytologic findings present in most of these groups, but absent or very rare in other granulomatous lymphadenitis were: LD kinetoplasts, plasma cells with different shapes of inclusions (round, rectangular, oval), lymphogranular bodies. Rare findings not reported previously were: intraneutrophilic LD bodies, hematoxylin body–like inclusions, fibroblasts, cytoplasmic blebbing and floating parasitophorous vacuoles.

**CONCLUSION:** Despite previous reports, emphasizing detecting LD bodies in diagnosing LLL, we present cytologic clues highly suggestive of this self-limited disease, when LD bodies cannot be detected or are very few on the smears.

From the Dr. Daneshbod Pathology Center, Shiraz, Iran.

**P-093 DIAGNOSTIC CHALLENGE IN AN UNUSUAL LUNG MASS: INFLAMMATORY PSEUDOTUMOR**

C. Ersöz, A. Uğuz, B. Biren and H. Zeren

Inflammatory pseudotumor (IPT) of lung a rare entity. Although clinical and radiologic features of these lesions mimic malignancy, IPTs generally are benign and not inflammatory masses. A 70-year-old man admitted to the hospital with dyspnea, cough, weight loss and weakness complained. Computed tomography scan (CT) showed a mass in the middle lobe of right lung. Radiologic and clinical findings were compatible with malignancy. A transthoracic fine needle aspiration procedure was performed. Cytologic samples were stained with May-Grünwald-Giemsa and Papanicolaou. Slides demonstrated highly cellular and mixed inflammatory background. Atypical cell groups with a high nuclear to cytoplasmic ratio and pleomorphism were observed. Nuclei of these cells were centrally located and had unevenly distributed chromatin. The cytologic findings were accepted as “compatible with non–small cell carcinoma.” Two weeks later the patient underwent the middle plus superior lobectomy of right lung. On microscopic examination, the case was reported as “organizing pneumonia, widespread interstitial fibrosis and inflammatory pseudotumor.” Fine needle aspiration (FNA) cytology of IPT is diagnostically challenging and only rarely described in the literature. On the basis of clinical and radiologic findings, its cytomorphic features are consistent with malignant tumor. For accurate diagnosis, pathologists should be always keep this entity in mind. Because IPT is rarely seen, we have added discussion of the cytologic, histologic and immunohistochemical characteristics of this case to the literature.

From the Department of Pathology, Medical Faculty, Çukurova University, Adana, Turkey.

**P-094 CYTOLOGIC FEATURES OF BASALOID CARCINOMA OF THE LUNG: REPORT OF TWO CASES**


**OBJECTIVE:** Basaloid carcinoma (BC) of the lung is a rare and
aggressive subtype of non–small cell lung cancer. Differential diagnosis from small cell carcinoma, large cell neuroendocrine carcinoma and poorly differentiated squamous cell carcinoma is very difficult. The cytologic features of BC arising in the lung have not been described precisely. We report the cytologic features in 2 surgical cases of the lung BC.

**CASES:** In Case No. 1 a 66-year-old man presented with cough, sputum and low-grade fever. A computed tomographic scan showed about 2×2 cm nodule in the right S2 segment. Transbronchial biopsy was performed, and the pathologic diagnosis was small cell carcinoma. The patient had stage IA disease; therefore, right upper lobectomy and nodal dissection were performed. In Case No. 2 a 75-year-old man was admitted with cough and wheeze. A computed tomographic scan showed a 3×3 cm nodule in the left S1+2 segment. Transbronchial biopsy and bronchial brushing cytology were performed. The cytologic diagnosis was large cell carcinoma, and the pathologic diagnosis was poorly differentiated adenocarcinoma. Left upper lobectomy and nodal dissection were performed. Histopathologically, the tumors of those cases were composed of small round cells showing peripheral palisading growth pattern with comedo-type necrosis. There was no glandular differentiation and keratinization. Immunohistochemical markers for smooth muscle and neuroendocrine cells were negative. The tumors of those 2 cases were finally diagnosed as BC.

**CONCLUSION:** It is important to recognize this disease, especially when neoplastic small round cells are noted in cytologic specimens. Cytologic features that may be useful for the diagnosis of BC are: (1) necrotic background; (2) clusters of small, monotonous round cells with scant cytoplasm, moderately hyperchromatic nuclei and inconspicuous nucleoli; (3) presence of rosette-like arrangement; (4) lack of Indian file pattern. Cytologic detection of nuclear palisading of the tumor cells may be difficult.

From Dohoku National Hospital and Japan Anti-Tuberculosis Association, Hokkaido Branch, Hokkaido, Japan.

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**P-095 MIXED SQUAMOUS CELL AND GLANDULAR Papilloma of the Lung: A Case Report**

R. Haba, Y. Kushida, K. Kadota, N. Katsuki, H. Ohsaki and E. Hirakawa

**OBJECTIVE:** Solitary mixed squamous cell and glandular papilloma of the lung is exceedingly rare. Only 7 cases have been reported in the literature. But, cytologically the present case has never been reported. Thus, we report the cytologic, histologic and immunohistochemical characteristics of this very rare tumor.

**MATERIALS AND METHODS:** A 59-year-old man who complained of no symptoms incidentally was revealed to show an abnormal shadow on his lung by chest radiographs. Computed tomography scans showed a small, solid nodule measuring 30×20 mm in size. Sputum and brushing cytology were performed. Because lung carcinoma was suspected, a partial pulmonary resection was done, together with intraoperative histologic diagnosis and imprint cytology. We examined this rare tumor by cytologic, histologic and immunohistochemical studies.

**RESULTS:** Preoperative sputum and brushing cytology were negative, but intraoperative imprint cytology revealed overlapping columnar cells with cilia and squamous cells without severe atypia. Macroscopically, a solid tumor was observed in the periphery of the lung, and the tumor was ill-defined and gray-white in color. Histologically, tumor cells were growing in an exophytic papillary pattern in the bronchia. The tumor was composed of fibrovascular cores with lymphoplasmacytic infiltrate lined by glandular and squamous epithelium, but no malignant cytologic features or stromal invasion were seen. Immunohistochemically, the squamous lesions were positive for CK7, CK13, EMA, and CEA, while glandular lesions were positive for CK7, CK18, EMA, and CEA. We diagnosed mixed squamous cell and glandular papilloma that originated in the lung.

**CONCLUSION:** It is difficult to diagnose a case cytologically before operation, because of sampling error and mild atypical epithelium. But due care should be paid to imaging diagnosis. When brushing cytology yields only mild atypical squamous and columnar epithelium, papilloma should always be considered a possible differential diagnosis.

From the Department of Diagnostic Pathology, University Hospital, Faculty of Medicine, Kagawa University; and Department of Medical Technology, Faculty of Health Sciences, Kagawa Prefectural College of Health Sciences, Kagawa, Japan.

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**P-096 USEFULNESS OF FINE NEEDLE ASPIRATION CYTOLOGY IN THE DIAGNOSIS OF RARE PSEUDOTUMORS: ROUNDED ATELECTASIS AND IDIOPATHIC RETRACTILE MESENTERITIS**

C. Hermosa, R. Ibarrola, F. Bilbao, M. Rodil and S. Bergara

**OBJECTIVE:** Fine needle aspiration cytology (FNAC) is a useful tool in supporting a clinical diagnosis of malignancy and in confirming the true nature of some uncommon benign lesions. We present 2 examples of the importance of this technique in rare pseudotumors.

**MATERIALS AND METHODS:** In Case No. 1 a 49-year-old man presented with a peripheral lung tumor. The clinical and radiologic workup was consistent with rounded atelectasis. FNAC was performed and the obtained material consisted of a mixture of pneumocytes and benign mesothelial cells. Malignant cells were not detected. The cytologic diagnosis confirmed the suspected diagnosis. The patient is well and free of disease 8 years later. In Case No. 2 a 47-year-old man presented with a mesenteric mass that was clinically and radiologically consistent with idiopathic retractile mesenteritis. FNAC was performed, and the obtained material consisted of a mixture of lipid-laden macrophages, benign-appearing spindle cells and mixed inflammatory cells. Malignant cells were not detected. The cytologic diagnosis was consistent with the clinical suspicion. The patient is well 2 years later.

**CONCLUSION:** FNAC is a useful tool in the initial diagnosis of tumor masses and may support the diagnosis of rare benign conditions that clinically and radiologically appear as probable malignancies.

From the Hospital de Basurto, Bilbao, Spain.

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**P-097 IDENTIFICATION OF SMALL EARLY LESIONS BY FLUORESCENCE DIAGNOSIS USING SAFE-3000 IN PATIENTS WITH ABNORMAL SPUTUM CYTOLOGY**


**OBJECTIVE:** Sputum cytology is the only examination that can...
detect central early lung tumors. However, even when atypical cells are seen in sputum, it can be difficult to localize the lesions. One reason for this is that conventional endoscopy cannot detect early lesions due to a lack of abnormal findings. To resolve this problem, fluorescence endoscopy was developed in the early 1990s. According to some reports, this system has improved the localized identification ratios of central type early lung cancers and dysplasia, and objective evaluations of the infiltration ranges of cancer focuses, and also the localized identification ratios of abnormal sputum cytology cases. Fluorescence diagnosis utilizes the phenomenon that autofluorescence differs between normal regions and lesions when specific light is irradiated. This paper reports our experience (257 cases) of using the autofluorescence endoscope system SAFE-3000 currently under development. The performance of fluorescence endoscopy was compared to that of conventional endoscopy using white light by performing the following examination in the same patients.

MATERIALS AND METHODS: Fluorescence diagnosis is performed in patients prior to undergoing lung cancer therapy, as part of thorough examination after sputum cytology, to observe clinical course after lung cancer surgery and in heavy smokers with respiratory symptoms.


CONCLUSION: Because fluorescence endoscopy is easy to perform and is useful in identifying small early lesions in patients with abnormal sputum cytology, the technique should contribute to the diagnosis of central early lung cancer.

From Tokyo Medical University Tokyo; and the International University of Health and Welfare, Tochigi, Japan.
[CIN] ± HPV); HSIL (CIN2 ± HPV; CIN3 ± HPV; microinvasive lesions); these refer to preclinical lesions of the uterine cervix. All patients with cytologic diagnoses of LSIL, HSIL and ASCUS, were send to the Colposcopy and Genitocytology Service. The colposcopic appearances were classified according to the criteria of Stall and Mattingly. In cases of abnormal findings, colposcopic biopsies were made and material was sent for histopathologic diagnosis. When surgical action was indicated during prepuerium (puerperium for SILs is until 1 year after delivery, OMS), few cases, we got a final diagnosis. The EPI INFO EXCEL Database was used.

**RESULTS:** The average age was 17.2 (13–19) years old, pregnancy age was 19.4 weeks and first intercourse occurred at 15 years (average). The average number of pregnancies was 1.69 and average number of partners was 1.79. The abnormal cytology results were as follows: SIL or HSIL, 136 (10%) cases; ASCUS 12 cases; LSIL, 110 (74.32%) of all abnormal cases, with HPV 65 cases and CIN1 ± HPV, 45 cases; and HSIL was CIN2 ± HPV, 23; CIN 3 ± HPV, 3; and microinvasive 0 (zero). The age for CIN 3 was: 15, 17, and 18 years old. There were 32 (2.29%) of all adolescents adolescent pregnant women who were HIV+. In this group there were 18 (56.81%) abnormal cytology diagnoses. The more common infectious agents were Gardnerella vaginalis (33.45%) and Candida albicans (37.36%).

**CONCLUSION:** This paper stresses the importance of including adolescents in any SIL detection program.

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**P-102 PULMONARY BLASTOMA: A CASE REPORT**


**BACKGROUND:** Pulmonary blastoma is a rare malignant tumor, with a frequency of ~0.5% of lung cancers. This is a biphasic tumor composed of primitive epithelial and mesenchymal components. We report a case of pulmonary blastoma diagnosed as epithelial malignant tumor before the operation and as a pulmonary carcinoma by resected specimen.

**CASE:** A 69-year-old man had an abnormal shadow by chest radiograph in a test for old myocardial infarction. Malignant cells were demonstrated by sputum cytology and fine needle aspiration cytology (FNAC), and right middle lobectomy was performed with a diagnosis of lung cancer. In sputum cytology, small atypical cells with pyknotic nuclei and intensely orangeophilic cytoplasm were revealed with necrotic background. FNAC revealed abundant necrotic tissue, small and middle-sized clusters with overlapping and round pyknotic nuclei. Squamous cell carcinoma was considered from the cytology and adenocarcinoma from the FNAC sample. As a result, cytologically adenosquamous carcinoma, and collision of adenocarcinoma and squamous cell carcinoma were suspected. Seventy percent of this tumor was occupied by squamous cell carcinoma, and the other components were squamous cell carcinoma component and adenocarcinoma component with columnar epithelium. This case was histologically diagnosed as pulmonary blastoma.

**CONCLUSION:** In cytology of carcinosarcoma and pulmonary blastoma containing mesenchymal component, the pitfalls always should be kept in mind.

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**P-103 CYTOPATHOLOGIC STUDY OF RESECTABLE CASES IN PLEOMORPHIC CARCINOMAS OF THE LUNG**


**BACKGROUND:** Spindle and giant cell carcinomas of the lung are rare subtypes and are regarded as a type of lung carcinoma—pleomorphic carcinoma—have been reported as having a poor prognosis.

**METHOD:** Preoperative samplings of 6 histologically proven pleomorphic carcinoma of the lung were retrospectively reviewed in order to evaluate their cytologic characteristics.

**RESULTS:** The patient population comprised 4 men and 2 women aged 45–65 years (mean 63). Three patients died of the disease, and there was statistical difference in patient prognosis between pleomorphic carcinoma and nonsarcomatoid carcinoma of the lung at surgically curable stage I. Using light microscopy, a cytopathological diagnosis of malignancy was established in all cases. The histologic diagnosis showed 3 adenocarcinomas, 2 large cell carcinomas and 1 non–small cell carcinoma. In spite of an initial diagnosis of malignancy from the cytologic material, the correct diagnosis of pleomorphic carcinoma was made by surgical specimen. The cytologic specimens contained 3-D clusters, glandular structures or numerous malignant cells showing cytocuclear atypia or necrosis and spindle cells. These results represent an important finding and highlight a potential pitfall that can occur when evaluating tumors containing spindle cells, which are considered sarcomatoid components. It is difficult to distinguish sarcomatoid carcinoma from true sarcomas on cytologic specimens.

**CONCLUSION:** Cytologic studies of pleomorphic carcinomas are few and generally inconclusive. This is due to the rarity, phenotypic heterogeneity and variable clinical presentation of these carcinomas. In this study, we retrospectively analyzed the cytologic features of histologically proven pleomorphic carcinomas in order to characterize the diagnostic features of these tumors and to compare these with those reported in the literature.

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**P-104 CYTOLOGIC FEATURES OF LUNG ADENOCARCINOMA WITH EPIDERMAL GROWTH FACTOR RECEPTOR MUTATION**


**OBJECTIVES:** The epidermal growth factor receptor (EGFR) is a major regulator of several distinct and diverse signaling pathways. It is frequently overexpressed in many malignancies, including lung cancers of the non–small cell type (NSCLC), and the overexpression may be associated with a negative prognosis. A recent finding that mutations of the gene in lung cancers predict, somewhat imprecisely, for response to TK inhibitors has generated much interest. Mutations target adenocarcinoma histology, East Asian origin, women and never smoker status. Recently gene amplification has been identified as a further factor that predicts response to therapy. We investigated the cytologic features based on the difference of mutations and amplification of the EGFR gene.

**MATERIALS AND METHODS:** We investigated the cytologic features, for instance, morphologic appearances, cellular arrangement, variability, nuclear to cytoplasmatic ratio (N/C), density of...
chromatin, state of nucleoli and other findings by 3 cytologists with- out any clinical and genetic information of lung adenocarcinoma with EGFR mutations (N = 40) and without mutations (N = 40). We next inquired into clinical findings of each case, some of test that included a history of treatment with the tyrosine kinase inhibitor gefitinib. We also measured the relative copy number of EGFR gene at DNA level though Q-PCR. Finally, we investigated correlation of all data.

RESULTS: The characteristic appearances of adenocarcinoma cases with EGFR mutations are less variability and N/C ratio and finer chromatin compared with those without EGFR mutations. In the clinical findings, although the distribution of pathologic stage does not differ, the mortality is better in the cases with EGFR mu- tation treated with gefitinib. The relationship between the mor- phologic features and the relative copy number of EGFR gene at DNA level was obscure.

CONCLUSION: The morphologic feature of lung adenocarcino- ma with EGFR mutations is less aggressive compared with those without mutations.

From the First Department of Surgery, Tokyo Medical University, Tokyo, Japan.

P-105 DIAGNOSIS AND CHARACTERISTICS IN PERIPHERAL EARLY-STAGE LUNG CANCER


The lung cancer death rate is increasing throughout the world. In our institution, the 5-year survival rate has gradually improved. These results could be due to improvement of therapeutic proce- dures including surgery, chemotherapy, radiotherapy and laser therapy. Furthermore, the improvement of survival may be partial- ly due to lung cancer mass screening instituted by the Health Insur- ance Act of 1987. However, there are various problems in the treat- ment of early-stage lung cancer. Peripheral-type early-stage lung cancer was defined as a tumor located in an area more peripheral than subsegmental bronchi, and the longest dimension of the tumor should be ≤ 2 cm and with no recognized lymph node and distant metastases. But, it is difficult arrive at a definitive diagnosis. In our hospital, transbronchial diagnostic method such as TV-brushing was tried first. Then, computed tomography (CT)-guided NB was tried. We tried to examine the efficacy of preoperative diagnosis. The relationship between cell features and CT findings was also ex- amined. The tumor, which included wide GGO area on CT scan, showed mild atypicality. Definitive diagnosis in these tumors is difficult.

From Tokyo Medical University, Tokyo, Japan.

P-106 FINE NEEDLE ASPIRATION DIAGNOSIS OF TALC POWDER GRANULOMA OF THE LUNG: A CASE REPORT

D. Sarma and Q. Li

Fine needle aspiration biopsy (FNAB) has been used as a useful di-agnostic tool for cytologic diagnosis of many pulmonary lesions. This has been commonly used to diagnose primary and metastatic neoplastic diseases of the lung. Tuberculosis, sarcoidosis and fungal infections are some of the common nonneoplastic causes of lung granuloma. Talc powder granuloma is one of the rare forms of benign lung lesion that may be confused with other forms of malignant and nonmalignant conditions of the lung. In this cytology case report, we discuss the utility of lung cytology in the diagnosis of this variant of granuloma of the lung. As in this case, an early aspiration biopsy, prompt cytologic diagnosis and identification of the benign granulomatous lesion helped us to avoid many unnecessary investiga- tions including tissue biopsy. This ultimately led to a quick and cost-effective patient management.

From the Osaka City University Graduate School of Medicine and Osaka Medical Center and Research Institute for Maternal and Child Health, Osaka; and Wakayama Medical University, Wakayama, Japan.

P-107 CYTOLeGIC FINDINGS OF PLEURAL EFFUSION OF PLEUROPULMONARY BLASTOMA

K. Wakasa, T. Wakasa, M. Nalayama and N. Obatake

BACKGROUND: There are several reports on the cytologic find- ings of fine needle aspiration cytology (FNAC) or imprint speci- mens of childhood pleuropulmonary blastoma (PPB), but few reports on the cytologic findings of pleural effusion. We present the cytologic features of pleural effusion of PPB.

CASE: A 3-year, 6-month-old girl presented with back pain and fever. Chest radiograph showed an abnormal shadow in the lower lobe of the right lung. The CT-scan on admission revealed a large amount of pleural effusion and a multicystic mass located between the lower lobe of the right lung and chest wall. Thoracentesis was performed, and pleural fluid was obtained for cytologic examina- tion. After that, a right lobectomy was performed and an imprint cy- tologic specimen from the tumor was also obtained for examination. After the operation, she underwent systemic chemotherapy and au- tograft bone marrow transplantation. It has been 9 years since the lobectomy, and the patient shows no evidence of disease. The cyto- logic specimens of pleural fluid showed many loosely arranged small clusters with a necrotic background. These cells had cytoplasmic cytoplasm with clearly outlined borders. Their nuclei were mildly en- larged and had finely granular chromatin and 1–3 small nucleoli. The nuclear grooves could be seen. The nuclear membranes were slightly thickened. Frequent mitoses were noted. In some areas, the cells showed a single-file arrangement with nuclear moldings. The imprint materials showed 2 cell types. One population of cells had mildly enlarged oval nuclei and finely granular chromatin. The other population of cells comprised blastomatous cells that had small, spindle-type hyperchromatic nuclei.

CONCLUSION: The cytologic findings of FNAC or imprints of PPB were reported to show a biphasic pattern. In this case, the cy- tologic features of pleural fluid of PPB showed a single type of epithelial cells.
P-108 CYTOLOGIC DIAGNOSIS OF CHORDOID TUMORS ARISING IN THE CENTRAL NERVOUS SYSTEM

J. Rodriguez-Costa, C. Agra, V. Parra and E. Salinero

INTRODUCTION: Several endocranial tumors can show chordoid appearance, making their morphologic diagnosis difficult, consequently leading to potential erroneous management.

MATERIALS AND METHODS: We studied 4 osseous central nervous system choromas and 1 ovoid choroid meningioma. All 5 cases were stained with Diff-Quik, and the cytologic characteristics were compared with the histologic and the immunohistochemical findings.

RESULTS: The main criteria useful in the differential diagnostic were the presence of cohesive plaques, a microfibrillar metachromatic background, syncytial cellular groups, striking cell irregularity, scarcity or absence of nuclei and presence of nuclear pseudo-inclusions.

From HGU Gregorio Marañon, Madrid, Spain.

P-109 FINE NEEDLE ASPIRATION OF MERKEL CELL CARCINOMA

J. B. Vasquez, G. A. Barkan and E. M. Wojcik

BACKGROUND: Merkel cell carcinoma (MCC) is an uncommon, aggressive, neuroendocrine carcinoma of the skin that commonly occurs in the head, neck and extremities in elderly individuals. It exemplifies a high incidence of recurrence; with local and systemic lymph node metastasis.

STUDY DESIGN: An electronic case search from 1995 to 2006 yielded 5 cases of MCC from a total of 3,268 fine needle aspirations (FNA) performed at our institution. Clinical information was obtained. Cytomorphologic and immunocytochemical findings were compared with the histologic and the immunohistochemical findings.

RESULTS: The main criteria useful in the differential diagnostic were the presence of cohesive plaques, a microfibrillar metachromatic background, syncytial cellular groups, striking cell irregularity, scarcity or absence of nuclei and presence of nuclear pseudo-inclusions.

From HGU Gregorio Marañon, Madrid, Spain.

P-110 METASTATIC GANGLIONEUROBLASTOMA IN HEAD AND NECK DIAGNOSED BY FINE NEEDLE ASPIRATION: A CASE REPORT

Yahya Daneshbod and Habib Nourani Khojasteh

BACKGROUND: To describe the cytologic findings of a case of ganglioneuroblastoma metastatic to the jaw and neck.

CASE: A 15-year-old boy, with a known case of ganglioneuroblastoma of the kidney for 10 years presented with right mandibular and neck mass on 2 occasions, 1 year apart, which was diagnosed as metastatic ganglioneuroblastoma by fine needle aspiration (FNA). FNA showed neurofibrillar material, small, malignant cells, Homer-Wright rosettes, mononucleated, binucleated and multinucleated ganglion cells and also Reed-Sternberg-like ganglion cells. Metastatic ganglioneuroblastoma was diagnosed on both occasions and the patient received appropriate treatment with resolution of the lesions.

CONCLUSION: This case illustrates the FNA findings of metastatic ganglioneuroblastoma in the head and neck region.

From Dr. Daneshbod Pathology Laboratory; and Department of Hematology Oncology, Nemazi hospital, Shiraz, Iran.

P-111 SURPRISE CYTOLOGIC DIAGNOSIS OF AN ABDOMINAL SUBCUTANEOUS NODULE: MALIGNANT MESOTHELIOMA

A. Uguz, C. Deniz, F. Cevlik, G. Sakman, H. Zeren and S. Zorluçmen

Malignant mesothelioma (MM) originates from mesothelial cells of visceral and parietal surface of pleura and occasionally peritoneum. The tumor starts as small, raised area on the mesothelium and progresses to coalescent nodules and finally form widespread mass. Although fine needle aspiration cytology (FNAC) is used for diagnosis of MM conventionally, peritoneal malignant mesothelioma, which arises as a subcutaneous nodule and is diagnosed with FNAC, is quite uncommon. A 68-year-old woman who had a cholecystectomy 10 years ago presented to the polyclinic of general surgery with an abdominal subcutaneous nodule lasting 1 or 2 months. Computed tomography (CT) scan revealed a periauricular mass, cholestasis and a subcutaneous nodule at the anterior abdominal wall near the old incision scar. This nodule was 3 cm in diameter. For diagnostic purposes FNA was performed to the nodule. Slides of the FNA samples from the nodule were stained with May-Grünwald-Giemsa and Papanicolaou. According to cytomorphology and immunocytochemical stains, the case was reported as “neoplastic development (mesothelioma?)..” After 23 days she was operated and the mass on the abdominal wall diagnosed as “malignant epithelial tumor, compatible with epithelial mesothelioma.” Hence we could not find any case report of peritoneal malignant mesothelioma diagnosed with FNA in the literature, and we presented this rare case with cytologic and histopathologic features and differential diagnosis.

From the Departments of Pathology and General Surgery, Medical Faculty, Çukurova University, Adana, Turkey.
P-112 IMMUNOCYTOCHEMICAL EVALUATION OF 4 ANTIBODIES IN CORRELATION WITH NEW THERAPEUTIC PROCEDURE IN PATIENTS WITH MESOTHELIOMA


OBJECTIVE: Mesothelioma has an increased rate and contributed significantly to cancer-related morbidity and mortality in the last decades. The differential diagnosis mesothelioma from adenocarcinoma remains a major challenge for most cytopathologists. The early detection of mesothelioma in combination with appropriate therapy are of great significance for patients’ long-term survival. Immunocytochemistry seems to be the key diagnosis. The aim of the present study was the investigation of mesotheliomas with a panel of immunocytochemical markers and the response of new therapeutic schedule in these patients.

MATERIALS AND METHODS: This study included pleural and ascitic fluids collected by 15 cancer patients. The specimens were prepared with the use of thin monolayer cytology (ThinPrep technique) and stained by Papanicolaou method. Moreover, we used a panel of immunocytochemical markers (calretinin, HBME-1, cytookeratin 5 and mesothelin) in order to distinguish mesotheliomas, especially epithelioid type, from adenocarcinomas. Immunocytochemistry was performed with the use of Ventana Nex Es Automated slide stainer and related Ventana reagents.

RESULTS: Diagnosis was based on clinical, cytologic and immunocytochemical findings. Calretinin had the best sensitivity and specificity for the mesothelioma followed by HBME-1, Mesothelin and CK 5. Furthermore, 10 of 15 patients who were treated with chemotherapeutic agents (carboplatin and pemetrexed) had better survival rate (16–24 months).

CONCLUSION: The tumor markers calretinin, HBME-1, mesothelin and CK 5 seem to have the best sensitivity and specificity for the diagnosis of mesotheliomas. The early detection of malignant mesothelial cells with appropriate immunocytochemistry contributes in prompt treatment procedure. Consequently, this point is of high interest because the application of this new therapeutic schedule (carboplatin and pemetrexed) seems to improve the survival of these patients.

From the Cytopathology and Pulmonary Departments, Theagenion Anti-Cancer Hospital, Thessaloniki Greece.

P-113 HISTOCYTOLGY FEATURES OF POORLY DIFFERENTIATED ADENOCARCINOMA WITH RHABDOID FEATURE AND MALIGNANT RHABDOID TUMOR

Y. Kobayashi

OBJECTIVE: Histocytologic distinction between carcinoma with rhabdoid feature and malignant rhabdoid tumor.

MATERIALS AND METHODS: Case A was 78-year-old man with multiple tumors in the abdominal cavity. His past history showed lobectomy for poorly differentiated adenocarcinoma of the left upper lung with lymph node metastasis showing focal rhabdoid feature. Abdominal tumors were resected as much as possible. Although intraoperative diagnoses of frozen sections and imprint cytology were done, the definite diagnosis was unknown. Three weeks after the operation, he died due to tumor recurrence and peritonia.

CONCLUSION: In Case A, the histocytologic features of the tumors were almost the same as each other. Both of the tumors were characterized by large, round to polygonal cells with eccentric nuclei, high nuclear to cytoplasmic ratio, vesicular chromatin, prominent nucleoli and abundant eosinophilic cytoplasm. It was difficult to differentiate between them. However, in contrast with the tumor cells of malignant rhabdoid tumor, the cells of poorly differentiated adenocarcinoma with rhabdoid feature (case A) appeared to be more epithelial, rarely more cohesive and even tend toward glandular structure. The cytoplasm was relatively foamy, clearer and thinner than that of the rhabdoid tumor. The maturation of the former was more than that of the latter.

From Matsusato Hospital, Osaka, Japan.

P-114 SIGNIFICANCE OF TERMINAL DEOXYNUCLEOTIDYL TRANSFERASE DETERMINATION IN CEREBROSPINAL FLUID OF ACUTE LYMPHOBLASTIC LEUKEMIA PATIENT: CORRELATION WITH CONVENTIONAL CYTOTOLOGY

Lee Kyung-A, Park Gyeongsin, Kim Yonggoo, Cho Bin, Kim Tae-Jung, Lee Youn-Soo, Kang Chang-Suk, Shin Sung-In and Lee Kyo-Young

The central nervous system (CNS), a sanctuary organ, is frequently involved by acute lymphoblastic leukemia. Cerebrospinal fluid (CSF) cytology, conventional cytopsin cytology, has been regarded as the gold standard for monitoring of CNS leukemic involvement. But occasionally, low cellularity and cytopathic degeneration may lead to false cytologic diagnosis. Terminal deoxynucleotidyl transferase (Tdt) is found in lymphoblasts but not in mature lymphocyte. Here we tried to evaluate the significance of CSF-Tdt determination, as an auxiliary diagnostic tool, through correlation with conventional CSF cytopsin preparation cytology. Retrospectively collected, 64 CSF Tdt determination–conventional cytology matched cases from acute lymphoblastic leukemia (ALL) patients who were in follow-up after complete remission were entered in this study. Tdt determination was performed by flow cytometry, and cases containing > 20% Tdt+ cells were referred as positive. The conventional cytopsin was performed by Shandon Cytopsin, and cases containing morphologically definite blastic cells were referred as positive. The time range from CSF sampling to cytopsin preparation were 2–6 hours at room temperature. On correlation, a total of 64 cases were analyzed as 3 cytology+/Tdt+, 39 cytology−/Tdt−, 4 cytology+/Tdt− and 18 cytology−/Tdt+. The concordance rate was 65.6% (42 of 64). After reviewing the cytology slides by 3 blinded pathologists, 1 of 4 cytology+/Tdt− cases was controversial, positive by 1 pathologist but negative by 2. But the results of 3 consecutive CSF cytology studies were negative. Cytopathic degeneration and low cellularity may confound the proper diagnosis. All 18 cytol-
P-116 DEFINITIVE DIAGNOSIS OF MESOTHELIOMA BY EFFUSION CYTOLOGY: THE UTILITY OF CELL TRANSFER AND CELLBLOCK METHODS FOR IMMUNOCYTOCHEMICAL STAINING

S. Maeda, M. Hosone, H. Katayama and Z. Naito

OBJECTIVE: The purpose of this study is to clarify whether mesothelioma can be diagnosed definitely by effusion cytology using the cell transfer and cellblock methods for immunocytochemical staining.

STUDY DESIGN: This study included the 5 patients with mesothelioma diagnosed by effusion cytology in the past 1 year and 3 months in our hospital. In 4 patients the mesothelioma was located in the pleural cavity, and in 1 patient it was in the peritoneal cavity. These patients were considered as having mesothelioma by effusion cytology. Furthermore, immunocytochemical staining was carried out for a definitive diagnosis using the cell transfer method for 4 patients and the cellblock method for 1 patient. Tumor cells were immunostained for antibodies such as calretinin, CK5/6, E-cadherin, EMA and CEA. An ultrastructural study was also performed on 2 of the mesotheliomas using cytologic material.

RESULTS: Calretinin was positive in 5 of 5 patients (100%), CK5/6 was positive in 5 of 5 (100%), E-cadherin was positive in 4 of 5 (80%), EMA was positive in 4 of 5 (80%), and CEA was positive in 0 of 5 (0%). Ultrastructurally, long, slender microvilli and intermediate filaments were confirmed in the tumor cells of 7 patients.

CONCLUSION: High-quality immunostaining results were obtained to diagnose mesothelioma definitively using cell transfer and cell block methods. The antibodies against calretinin, CK5/6, E-cadherin, EMA and CEA were particularly useful for a definite diagnois of mesothelioma. An ultrastructural study was also useful for confirming the diagnosis of mesothelioma.

From the Departments of Hospital Pathology, Laboratory Medicine and Pediatrics, College of Medicine, The Catholic University of Korea, Seoul, South Korea.
P-119 CYTOLOGIC CHARACTERISTICS OF PLEURA PATHOLOGY


Cytologic material of 1,745 patients with pleuritis diagnosed in 2002–2006 was investigated using polylayer spin dryer, cytochemistry and immunocytochemistry. The results were compared with the data of territory cancer registry and results of histologic investigation of primary tumors. Cytologic characteristics of mesothelium cell variety and peculiarities of nonmalignant pleuritis as well as pleurites caused by primary and metastatic malignant tumors were analyzed. Among nonmalignant pleurites there were tuberculous (13.5%), cholesteric and chylous (0.2%), with reactive lesions (63.3%). Pleurites caused by malignant tumors were observed in 23.3% of patients, among those were carcinomatosis (17.1%), primary tumors (5.3%) and malignant nonepithelial tumors (0.9%). Carcinomatosis pleurites were more frequent in patients with cancers of the lung (55.9%), breast (22.4%) and ovary (11.8%). Pathognomonic indicators of tumor were found in pleural effusion for breast, ovarian, gastric, renal cancers, small cell lung cancer (SCLC) and non–small cell lung cancer (NSCLC). It was difficult to ascertain such indicators for colon, prostate and endometrial cancers because of uncommon pleural metastases of these tumors. Special indicators of lung adenocarcinoma were not found. Malignant mesotheliomas of pleura presented the most difficult cases for cytologic diagnosis. Immuno-cytochemistry techniques with the set of oncomarkers (11 antibodies) were used. There currently is no specific marker for malignant mesothelioma. Mesotheliomas typically show positive reactions with mesothelial cell clone HBME-1, calretinin clone DAK-C2 and Calret 1, thrombomodulin clone 1009, epithelial membrane antigen (EMA) clone E29, vimentin clone V91 and cytokeratin AE1/AE3. Adenocarcinomas in pleural effusion are typically immunopositive with carcinoembryonic antigen, epithelial antigen clone Ber-EP4 and CD-15. In most cases (89.7%) the diagnosis of mesothelioma was possible due to new technologies of pleural effusion processing and usage of monoclonal antibodies.

From the Altai division of Russian N.N. Blokhin Cancer Research Center, Altai Oncological Center, Barnaul; and the Russian N.N. Blokhin Cancer Research Center, Moscow, Russian Federation.

P-120 EVALUATION OF PODOPLANIN AND H-CALDESMON IN DIAGNOSIS OF MESOTHELIOMA ON CYTOLOGY SPECIMENS

Y. Pang, R. Fu and C. Michael

BACKGROUND: Antibodies Podoplanin and h-caldesmon (h-CD) are relatively new members reacting to mesotheliomas on tissue specimens. The different growth environment in body effusions and specimen processing in cytology may cause alteration of antigens. It is necessary to assess these antibodies on cytology specimens in order to extend their use in the diagnosis of mesothelioma in cytology.

MATERIALS AND METHODS: Previously collected paraffin-embedded cellblocks of pleural effusion specimen, including 32 mesotheliomas, 32 selected carcinomas, mainly metastatic carcinoma from ovary, breast and lung, and 7 specimens of reactive mesothelial cells were studied. Antibodies Podoplanin, h-CD were used. The conditions of reaction were based on the manufacturer’s recommendation. Stained slides were examined under light microscope and recorded in a scale of 0–3 by estimate of the percentage of tumor cells stained by the antibodies (none = 0, 5–25% = 1, 25–50% = 2, >50% = 3). A stain result of >1 is considered positive.

RESULTS: Podoplanin was positively reactive to 90.63% (29) of mesothelioma specimens with membranous patterns and h-CD to 37.5% (12) of mesothelioma with cytoplasmic pattern. Six (18.75%) adenocarcinomas reacted with Podoplanin and 1 case (3.13%) to h-CD. The reactivity of both antibodies to mesothelioma and adenocarcinomas were statistically significant (p < 0.001). Reactive mesothelial cells in 4 of the 7 cases reacted to Podoplanin but not to h-CD.

CONCLUSION: Although both antibodies were useful, Podoplanin was superior to h-CD in differentiating epithelialioid mesothelioma from carcinomas on cytology specimen in our laboratory. The low reactivity of h-CD to mesothelioma may be caused by extended antigen retrieval and may be improved through further technical adjustment. The antibodies were not able to distinguish reactive mesothelial cell from malignant ones.

From the University of Michigan, Ann Arbor, Michigan, U.S.A.
P-121 ASSESSMENT OF ABDOMINAL FAT PAD FINE NEEDLE ASPIRATION FOR DIAGNOSIS OF SYSTEMIC AMYLOIDOSIS

Y. Pang, A. Ciolino, R. Pu, C. Michael and G. Leiman

BACKGROUND: Amyloidosis comprises abnormal extracellular deposition of proteins, characterized by electron microscopic non-branching fibril morphology. Diagnosis was traditionally made on organ biopsies, but abdominal fat pad fine needle aspiration (FNA) has been utilized since 1970 with comparable efficacy. Two processing methods are described; direct smears, staining fragments of fibrovascular tissue with Congo red, or cellblock creation from pooled needle passes, applying Congo red to 8-μm sections. Positive specimens are focally “salmon pink” by light microscopy, with apple-green birefringence on polarization. The quality of the polarized green color is critical for the diagnosis. This study reviews cases with the 2 protocols of specimen processing and assesses color perception as a possible cause of error.

SUBJECTS: Consecutive cases of abdominal fat pad aspiration (23 direct smears, 105 cell blocks) from 2001 to 2006 at 2 teaching medical institutions, a total of 128 specimens, were identified. Tissue biopsies and clinical outcome were used as final arbiters.

RESULTS: Average patient age was 63 (39-87) with a male to female ratio of 1.5:1. All initially positive and false negative cases (38) were reviewed. Of 103 initially negative cases, 13 were positive for amyloid in later surgical biopsies. Sensitivity and specificity were 69.77% and 93.75%, respectively. All false positive cytotologic diagnoses were based on incorrect perception of apple-green birefringence. Most (79%) of the cases had additional tissue biopsies. Seventy-two percent (72%) of the cases were patients with myeloma or monoclonal gammopathy.

CONCLUSION: Fat pad FNA is effective in obtaining diagnostic specimens for diagnosis of systemic amyloidosis, with sensitivity equivalent to biopsy, but several falsely positive reports. Review of slides revealed that the diagnostic errors were mainly incorrect judgment calls of the apple-green color. This should prompt development of better tools to improve the diagnostic accuracy.

From the University of Michigan, Ann Arbor, Michigan, and University of Vermont, Burlington, Vermont, U.S.A.

P-122 CYTOLOGIC DIAGNOSIS OF A DYSEMBRYOPLASTIC NEUROEPITHELIAL TUMOR

J. Rodriguez-Costa, V. Parra, C. Agra and E. Salinero

Dysembryoplastic neuroepithelial tumor is a temporal benign neoplasm in children and young adults. Patients suffer from long-standing partial seizures. Our patient was a 15-year-old boy with convulsive crises refractory to drug treatment. During surgery, we were asked for an intraoperative diagnosis. We perform a squash preparation on all central nervous system tumors for intraoperative quick diagnosis. Oligodendroglioma and dysembryoplastic neuroepithelial tumor were possible diagnoses. The presence of a dual cell population with oligodendroglia-like neurons is characteristic; furthermore the vascular pattern is poor and the background is mucinous and roughly fibrillar, different from oligodendrogliomas. The typical clinical presentation, radiologic findings and morphology of the macroscopic lesion, in combination with the cytologic features, were helpful in this case for a correct intraoperative diagnosis.

From the Hospital Gregorio Marañón, Madrid, Spain.

P-123 SYNCHRONOUS METASTATIC MALIGNANT MELANOMA AND HIGH-GRADING SQUAMOUS INTRAEPITHELIAL LESION ON A CERVICAL PAP SMEAR: A CASE REPORT

N. Patel, S. Bergman and A. Garvin

OBJECTIVE: Malignant melanoma (MM) can behave aggressively after metastasis from a primary cutaneous location. We describe a case of metastatic MM involving a cervical Pap smear associated with a high-grade squamous intraepithelial lesion (HGSIL).

CASE: A 46-year-old Caucasian woman was evaluated for worsening headaches and nausea and vomiting. Importantly, she had a large lentigo maligna on her left cheek that was never resected. A computed tomography scan of the head revealed a 2.6 cm intracranial mass within the right temporal lobe. The tumor was grossly melanotic, and histology revealed metastatic MM. Subsequent imaging revealed multiple metastases, including the bilateral lungs, in addition to endometrial thickening. Three weeks later, an endometrial biopsy revealed stroma virtually replaced by metastatic MM. The concurrent cervical Pap smear revealed numerous MM cells, in addition to HGSIL. One month later, the patient experienced acute mental status changes and lumbar puncture revealed cerebrospinal fluid containing MM cells. Since her initial diagnosis, the patient has undergone chemotherapy and radiotherapy and, to the best of our knowledge, is alive and undergoing end-of-life care.

RESULTS: The cervical Pap smear was processed using the liquid-based SurePath Pap test. The HGSIL cells were arranged singly and in syncytial groups displaying hyperchromasia, increased nuclear to cytoplasmic ratios and nuclear membrane irregularities. A second population of abnormal cells consistent with MM displayed single cells with epithelioid shaped and eccentrically placed nuclei with prominent nucleoli, abundant binucleated forms and uniform, granular, brownish to blackish pigment consistent with melanin. Immunohistochemical staining performed on an additional unstained SurePath Pap sample using pan-melanoma cocktail displayed diffuse, intense and selective staining of the MM cells.

CONCLUSION: When evaluating abnormal cervical Pap smears, one must consider a metastatic neoplasm in the differential diagnosis, including MM. Although extremely rare, MM can involve cervical Pap smears and mimic a squamous intraepithelial lesion or glandular abnormality.

From Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina, U.S.A.

P-124 STUDY OF FINE NEEDLE ASPIRATION CYTOLOGY OF ADRENAL GLAND LESIONS

R. G. W. Pinto

OBJECTIVES: The aims of this study was to evaluate the utility of fine needle aspiration cytology (FNAC) in the diagnosis of adrenal gland lesions and also to estimate the incidence and types of lesions encountered in the adrenal glands.

MATERIALS AND METHODS: This study was conducted in the Pathology Department of Goa Medical College between 1990 and 2005. We encountered 23 cases of adrenal gland lesions. The cases were diagnosed by ultrasound and computed tomography (CT)-guided FNAC and confirmed by histopathology.

RESULTS: The adrenal gland lesions were as follows: metastases...
from squamous cell carcinoma of the lung (6 cases), pheochromocytoma (5 cases), neuroblastoma (4 cases), adrenal cortical tumor (2 cases), non-Hodgkin’s lymphoma (1 case) and tuberculosis (5 cases). Of the 23 cases, 3 were bilateral and multicentric. The youngest patient was a 2-year-old boy with neuroblastoma and the oldest was a case of pheochromocytoma in a 75-year-old male.

CONCLUSION: This study evaluated and diagnosed by FNAC 23 cases of adrenal gland lesions. Of these, 3 were bilateral and multicentric. One patient, a 14-year-old girl, had a family history of pheochromocytoma (familial pheochromocytoma). Eighteen cases were neoplastic and 5 cases were nonneoplastic. There was 1 case of lymphoma and 6 cases of metastasis from carcinoma of the lung.

From Goa Medical College, Goa, India.

P-125 ROLE OF THE CYTOLOGIST IN VON HIPPEL-LINDAU DISEASE
R. G. W. Pinto

OBJECTIVE: The aim of this study is to evaluate the role of the cytologist in diagnosis of Von Hippel-Lindau disease.

MATERIALS AND METHODS: A total of 210 cases of renal cell carcinoma diagnosed by fine needle aspiration cytology (FNAC) and confirmed by histopathology at Goa Medical College were studied during the period 1995–2004. In these 210 cases, we encountered 2 cases of Von Hippel-Lindau disease.

RESULTS: Of the 210 cases of renal cell carcinoma encountered on FNAC and histopathology, 2 cases of Von Hippel-Lindau disease were encountered. The patients were analyzed by a detailed clinical history, past history and a clinical examination and sonography and computed tomography (CT) scan examination. These patients of Von Hippel-Lindau disease also showed cerebellar hemangioblastomas, cysts in the pancreas and papillary cystadenomas of epididymis.

CONCLUSION: In Von Hippel-Lindau disease, cytologists have a role in FNAC of the renal tumor and tumors diagnosis and also has to take into account a detailed clinical history, clinical examination, past history, ultrasound and CT scan findings to arrive at a conclusive diagnosis. Of the 210 cases of renal cell carcinomas, we were able to diagnose 2 cases of Von Hippel-Lindau disease.

From Goa Medical College, Goa, India.

P-127 POOR DIFFERENTIATED SYNOVIAL SARCOMA: A CASE REPORT
I. Ranogajec, V. Ramljak, I. Novosel and I. Bobuš

OBJECTIVE: We report a rare case of primary poorly differentiated synovial sarcoma (SS) in axillary region confirmed by histology. SS accounts for 5–10% of soft tissue sarcomas. Approximately 20% of cases have poorly differentiated appearance, most often characterized by undifferentiated round cell morphology resembling Ewing sarcoma.

MATERIALS AND METHODS: A 46-year-old female presented to our hospital complaining of a 10-cm, slightly painful mass in the right axillary region of 2 months duration. Clinical examination (computed tomography, ultrasonography) showed an expansive tumor mass. Ultrasound and computed tomography detected an expansive tumor mass. The specimen obtained by fine needle aspiration (FNA) was stained with May-Grünwald-Giemsa (MGG) and additionally immunocytochemically analyzed for BerEp4, CK7, CK20, vimentin and desmin. The cytologic diagnosis of sarcoma was confirmed. Tumor samples were sliced into 5-μm sections and standard stained with hematoxylin-eosin. The sections were subsequently analyzed by S-100, VIM, EMA, HMB45, MelanA, CD31, NEF, CK7, CK20, TTF-1 and SMA.

RESULTS: Cytologic analysis suspected the diagnosis of sarcoma. Surgical treatment was performed. Histopathologic and immunohistochemical analysis confirmed the diagnosis of poorly differentiated SS.

CONCLUSION: In spite of additional methods such as immunocytochemistry, the poorly differentiated variant of SS can be easily mistaken for numerous other tumors in cytologic smears due to complex, overlapping morphology and still limited experience of cytopathologists in the field of rare soft tissue tumors. Nevertheless recognition of these variant of SS is of major concern due to its worse prognosis.

References

From the University Hospital for Tumors, Zagreb, General Hospital Ivo Pedić, Sisk, Croatia.
P-128 SCOPE OF FNAC IN SOFT TISSUE TUMORS: FIVE YEARS OF EXPERIENCE FROM A TERTIARY CANCER REFERRAL CENTER IN INDIA
B. Rekhi, B. D. Gorad and R. Chinoy

OBJECTIVE: A total of 131 adequate aspirates of soft tissue lesions seen over a 5-year period were analyzed.

MATERIALS AND METHODS: Conventional Papanicolaou and May-Grünwald-Giemsa staining was available in all, with immunocytochemistry in few.

RESULTS: Fifty-four cases were referred for a primary diagnosis, and 35.1% and 10.7% of cases, respectively, were evaluated for recurrent and metastatic lesions. Extremities were the most common sites. A total of 76.3% were sarcomas, whereas 7.6% were benign, that is, lipomas. The remaining 19 cases (14.5%) were not categorized. Histopathologic confirmation available in 117 cases, gave a diagnostic accuracy of 98% with a positive predictive value of 98% in malignant cases and a negative predictive value of 100% in benign cases. Among the various cytologic categories, 61 cases (46.5%) were of spindle cell morphology, followed by 31 (23.6%) of round cell type and 15 (11.4%) lipomatous tumors. Another 14 cases (10.7%) were pleomorphic tumors; 7 (5.3%) were the epithelioid type and the remaining 3 were myxoid tumors. All the round cell, pleomorphic and myxoid tumors were sarcomas, whereas 57.3% of spindle cell types were labeled malignant. Fifteen cases (11.4%) were labeled as "unsure of malignant potential" and 2 were discordant. Of these, 9 cases proved to be malignant, 2 of "intermediate malignancy," 1 pseudosarcoma and 5 benign. The two false positive sarcomas were fibromatosis and pigmented schwannoma. Exact subtyping was offered, keeping the clinicopathologic context. An earlier study by author 1 using fluorescence immunocytochemistry with a confocal laser scanning microscope, proved valuable in precise soft tissue tumor diagnosis.

CONCLUSION: Fine needle aspiration cytology is effective in soft tissue tumor diagnoses for primary, recurrent and metastatic lesions. The cytologic subtypes, especially round cell and pleomorphic sarcomas, can be quickly sorted out. Immunocytochemistry is a useful adjunct.

From Tata Memorial Hospital, Mumbai, India.

P-129 INVESTIGATION FOR THE USEFULNESS OF IMPRINT SMEAR IN ECTOPIC PREGNANCY
Yasumi Sato

OBJECTIVE: To study the accuracy of imprint cytology in contrast to pathologic specimens in ectopic pregnancy.

STUDY DESIGN: We performed imprint cytology of the fallopian tube at surgery in 18 cases of ectopic pregnancy. After the operation, we compared the results of imprint cytology with the pathologic diagnosis.

RESULTS: In macroscopic examination, we confirmed villi in 11 of 18 cases. In microscopic examination, we confirmed villi in 14 cases. In cytologic examination, we confirmed trophoblasts in all 18 cases.

CONCLUSION: These findings suggested that imprint cytology of the tube is a useful means of diagnosing ectopic pregnancy.

From Sato Ladies Clinic, Kitakyushu, Japan.

P-130 PRIMARY MYCOBACTERIAL STERNOCLAVICULAR OSTEOMYELITIS PRESENTING AS A DESTRUCTIVE BONE LESION
R. Siderits, J. Godyn, O. Ouattara, P. Aufiero and A. Hazra

Primary sternoclavicular and sternal manubrial osteomyelitis is an infrequent presentation of mycobacterial infection. This paper documents the case of a 39-year-old man complaining increasing sternal pain over the course of several weeks. Diagnostic imaging revealed a lytic lesion in bone with destruction of the medial clavicular head and sternal manubrium. The lungs were without focal lesions. Differential diagnostic considerations included primary bone tumor and metastatic malignancy vs. infective or inflammatory process. Fine needle aspirate (FNA) smears of the clavicular head with onsite interpretation revealed multinuclear giant cells, epithelioid histiocytes and a fibroblastic spindle cell component within a background of viable and nonviable bony and cartilaginous tissue. Potentially misleading cytologic features include the presence of scattered osteoblasts and reactive appearing chondrocytes, most likely representing reparative process adjacent to the destroyed sternoclavicular joint and manubrium. The immediate interpretation was "reparative features, most likely associated with either infective or inflammatory process." The cellblock subsequently showed necrotizing granulomatous inflammation with characteristic Langhans'-type giant cells and acid-fast bacilli within the caseous material, confirmed by the acid-fast stain. The patient was placed on 4-drug treatment and responded with regression of bone in the destroyed portions of clavicle and manubrium. The possibility of an infectious etiology should not be minimized in the differential diagnosis of destructive bone lesions.

From the Roberts Wood Johnson University Hospital, Hamilton, New Jersey, U.S.A.

P-131 PILOMATRIXOMA IN ADULTS: A CHALLENGE FOR CYTOLOGISTS
K. Trutin Ostovic, S. Manojlovic, T. Stoos-Veic, G. Kaic and M. Virag

OBJECTIVE: Although pilomatrixoma is a benign skin adnexal tumor arising usually in the head and neck region in children, it could be detected by fine needle aspiration cytology (FNAC) in other body sites and in adults as well. We want to warn cytologists to think of this tumor while performing FNAC on skin nodules as well as to delineate diagnostic cytologic features that can be helpful in making the distinction from various primary cutaneous malignant tumors.

MATERIALS AND METHODS: Over 5 years (2001–2006) cyto-logists performed FNAC of pilomatrixoma in 16 patients with or without ultrasound guidance using 23 or 25G needles attached to 10- or 20-mL disposable syringes. Smears were stained with Papanicolaou and Pappenheim staining. The preoperative cytologic diagnoses were compared with the final histopathologic ones.

RESULTS: A total of 16 FNAs of pilomatrixomas were performed, 12 of which were diagnosed in adults (26–87 years old), mostly males. Accurate cytologic diagnoses were made in 14 patients. Two cases were misdiagnosed (both in adults): in one case basal cell carcinoma could not be excluded, and another was misdiagnosed for squamous carcinoma. Diagnostic cytologic features for pilomatrixoma include cellular aspirates, keratinized squamous and ghost cells,
multinucleated giant cells, pink and fibrillary material enveloping clusters of small, basaloïd epithelial cells with a high nuclear to cytoplasmic ratio and prominent nucleoli.

**CONCLUSION:** The FNAC diagnosis of pilomatrixcoma may be extremely difficult to reach, especially if there is a predominance of 1 component over the others. It should be considered in the differential diagnosis of small cell keratinizing lesions of skin at any age with different clinical presentation. It is important that the cytologist performs aspiration because of adequate sampling and clinical data that could be helpful in combination with morphologic features for making an accurate cytologic diagnosis.

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From the Departments of Clinical Cytology and Cytometry and Pathology Clinic of Oral and Maxillofacial Surgery, Dubrava University Hospital, Zagreb, Croatia.

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**P-132 CYTOPATHOLOGY, HISTOPATHOLOGY AND CYTOGENETICS OF AN UNUSUAL NEUROENDOCRINE TUMOR OF THE SPHENOID SINUS**

G. Wright, L. McGuire and A. Lam

A 44-year-old woman presented with headaches and was found on imaging to have a destructive tumor of the sphenoid sinus, which was biopsied and found on imprints and frozen section to contain plasmacytoid and small round cells. A specific diagnosis could not be reached. Immunohistochemistry showed a diverse range of staining, including positive cytokeratin and neuroendocrine markers. Weak vimentin stains were found, and desmin staining was negative. CD 99 gave a strong positive signal. Cytogenetic study demonstrated trisomy 22. The cytogenetics of these tumors has not previously been reported. The prognosis of these tumors is not well established, and this patient’s progress was complicated by cerebrospinal fluid leakage, which was repaired.

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From QHPS Gold Coast Hospital, Southport, Queensland, Australia.

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**P-133 CYTOLOGY OF BENIGN CUTANEOUS LESIONS**

Y. Yokoyama, K. Kashima, T. Daa, Y. Kondo, N. Yada, A. Gamachi, S. Urata, and K. Tsui

**OBJECTIVE:** Cytodiagnosis is widely recognized to be a useful modality in various organs. But cutaneous cytology is not popular except for Tzanck test. The main reason may be that cutaneous biopsy is an easy procedure. In addition, differential cytodiagnosis is puzzling because too many lesions exist, including epidermal, adnexal and mesenchymal tumors, and squamous cells and small round cells (so-called basaloïd cells) are commonly observed in various benign and malignant tumors of both epidermal and adnexal origins. The aims of this study are to depict the cytologic features of benign cutaneous lesions and assess the cytodiagnostic value in this field.

**MATERIALS AND METHODS:** For a recent year, we examined more than 100 cutaneous benign and malignant and epithelial and mesenchymal lesions in 3 institutes, most cytologic specimens of which were abandoned as insufficient samples. Finally, 16 types of benign lesions with sufficient quality for cytologic examination were used in this study. They included bullous lesions (pemphigus, pemphigoid and herpesvirus infection), benign epidermal tumors (molluscum contagiosum and seborrhoeic keratoses), cystic lesions (epidermal cyst, dilated pore and mucous cyst), adnexal tumors (pilomatrixcoma and accessory breast), melanocytic nevus, inflammatory lesions (pseudopeliosis and sarcoidosis) and mesenchymal lesions (neurofibroma, pyogenic granuloma and glomus tumor).

**RESULTS:** In general, cell collection was difficult, especially in the benign verrucous lesions such as verruca vulgaris, condyloma and seborrhoeic keratoses. Some benign lesions including pilomatrixoma, panniculitis and acantholytic cells from oral mucosa contaminated in sputum were readily confused with malignant tumor.

**CONCLUSION:** The difficulty of cell collection may be an additional reason why the cutaneous cytology is not popularized. All cytopathologists should recognize that some benign cutaneous lesions cytologically look malignant. Although the value of cytology of cutaneous lesions seems to be limited, it is important not to misdiagnose because of inexperience in this field.

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From Oita University; Almeida Memorial Hospital; and Oita Prefectural Hospital, Oita, Japan.

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**P-134 ASPIRATION CYTOLOGY OF 11 CASES EXTRASKELETAL EWING’S SARCOMA**

Yuri Batoroev and Maryna Kurjanowa

**OBJECTIVE:**Extraskeletal Ewing’s sarcoma (EES) is a round or small cell tumor that manifests most commonly in the paravertebral and pelvic regions. It occurs predominantly in adolescents and young adults and follows an aggressive course with a high recurrence. Fine needle aspiration biopsy (FNA) is especially effective with the help of immunocytochemical (ICC) and ultrastructural studies on the FNA material.

**MATERIALS AND METHODS:** FNA biopsy specimens from 11 histologically proven cases of EES were studied by light microscopy, immunocytohistochemistry and electron microscopy (EM).

**RESULTS:** All cases had cellular smears. The cells occurred mostly as loose sheets, but also as dispersed single cells, with rare mitoses and few apoptotic bodies. The small tumor cells had round (or molded) nuclei with somewhat coarse granular chromatin and inconspicuous nucleoli. Six cases had a rosette-like structure. The rosette-like structures lack the typical fibrillar material at their center, as seen in cases of neuroblastoma. Numerous naked nuclei and focal crush artifacts were seen. Mitoses were rare. All 11 tumors had abundant glycogen vacuoles. Ultrastructural studies showed characteristic features, such as intracytoplasmic glycogen, lipid droplets and primitive cell junctions.

**CONCLUSION:** EES shows cytologic features similar to Ewing’s sarcoma of bone. We would like to emphasize high diagnostic value presence of so-called punched-out clear spaces in the cytoplasm in EES smears and CD99/O13 immunostaining showed strong membranous reactivity. We also comment on the role of EM and ICC as ancillary technique in cytologic diagnosis of these tumors.

From Regional Oncology Hospital, Moscow, Russia.
P-135 GIANT CELLS PRIMITIVE LUNG NEOPLASIA DIAGNOSED WITH THYROID FINE NEEDLE ASPIRATION CYTOLOGY

J. Rodriguez-Costa, C. Agra, V. Parra and E. Salinero

INTRODUCTION: This case report is of a 77-year-old woman who presented with a palpable thyroid mass in the right lobe of 3 cm, asymptomatic. Metastasis rarely takes place exclusively in the thyroid gland; it is more frequently found in renal tumors (light cells adenocarcinoma) or colon, breast, melanoma and lung tumors. The incidence in autopsy studies is variable, with ranges of 2–24%. However, thyroid metastasis can be detected in only 1% of cases even before primary cancer is diagnosed. Macroscopically these present as circumscribed lesions.

MATERIALS AND METHODS: Cytologic material was obtained with fine needle aspiration cytology, later using Diff-Quik technique for a quick study and then with Papanicolaou technique.

RESULTS: Cytologic examination showed atypical cellularity and polymorphism, with cluster cells and giant, multiple nuclei, occasionally evident nucleoli, mitosis figures and cytoplasm. Immunohistochemical results were thyroglobulin negative, discarding a primary neoplasm. A peripheral lung tumor with adenopathies was confirmed after TC.

From HGU Gregorio Marañón, Madrid, Spain.

P-136 NEW CYTOPHYSIOLOGIC STAINING TECHNIQUE FOR DIFFERENTIAL DIAGNOSIS OF BENIGN AND MALIGNANT CELLS OF THYROID MASSES

Prof. Al-Rawi

OBJECTIVE: To assess the advantages of using new rapid cytophyslogic staining technique for differential diagnosis of benign and malignant cells of thyroid masses.

MATERIALS AND METHODS: Fine needle aspiration cytology (FNAC) was performed on 120 patients having a different clinical findings of thyroid masses. Two smears were done from the aspirate; 1 of the smears was used for Giemsa stain for morphologic study and the second for a new rapid cytophyslogic leukobase toluidine blue stain, which stains the benign cells in blue while malignant cells do not take the stain (unstained).

RESULTS: All smears of 120 cases show benign results in Giemsa staining technique. Four cases were unstained by the leukobase toluidine blue staining technique, which indicates the malignant cells. These 4 cases were confirmed histologically.

CONCLUSION: From the evidence available it is clear that this staining technique should be performed in routine cytology as a rapid and useful method of differential diagnosis of the tumors.

From Al-Kuwait University Hospital, Sana’a Yemen.

P-137 CYTOCHEMISTRY AND IMMUNOCYTOCHEMISTRY IN PREOPERATIVE DIAGNOSIS HYPERPLASTIC AND NEOPLASTIC PARATHYROID GLANDS

Lj Fustar-Preradovic, M. Halbauer, D. Danic and H. Tomic Brzac

Hyperparathyroidism is a syndrome caused by adenoma, hyperplasia or rarely by cancer of parathyroid glands. Medical treatment hyperparathyroidism consists of surgical removal of unaffected parathyroid glands or percuting inactivity of the tumor of parathyroid gland with alcohol. Both procedures demand preoperative localization of the tissue of the parathyroid gland. Introduction of ultrasound enabled more precise diagnosis and localization of the tissue of the parathyroid gland and possibility to perform ultrasound-guided fine needle aspiration biopsy. The obtained cell material is used for cytologic analyses, then determination of value of parathormones in the puncture, for cytologic, cytochemical and immunocytochemical analyses. The literature describes selective dyeing of zones of nuclear organizers by silver (AgNOR) in the cells of some tumors which shows a larger proliferative index in nuclei of the cells of tumors compared with normal or hyperplastic cells. We also immunostained all samples for Ki-67, chromogranin A and bcl-2. Our results demonstrated the difference between different lesions of parathyroid glands.

From the Departments of Pathology, Forensic Medicine and Cytology, and Otorhinolaryngology and Cervicofacial Surgery, General Hospital, Slavonski Brod, and Department of Nuclear Medicine and Radiation Protection, Zagreb University Hospital Josip Juraj Strossmayer Center Zagreb, Croatia.

P-138 DIAGNOSTIC UTILITY OF THE EXPRESSION OF CD15 AND HBME-1 IN FINE NEEDLE ASPIRATES IN DIFFERENTIATING BENIGN FROM MALIGNANT FOLLICULAR THYROID NEOPLASMS

J. Gornicka, M. Bogdanska, J. Domagala-Kulawik, B. Ziarkiewicz-Wroblewska and A. Wasiutynski

OBJECTIVE: Preoperative establishing of the malignancy of follicular thyroid neoplasm in fine needle aspiration (FNAs) represents an unsolved diagnostic problem. A consistent number of follicular tumors are surgically resected more for diagnosis than therapeutic purposes. Previous studies have suggested that CD15 and HBME-1 may be useful in the histopathologic diagnosis of follicular carcinoma. The aim of the study was to examine the expression of these antibodies in FNAs obtained from follicular tumors.

MATERIALS AND METHODS: An immunohistochemical analysis of expression of CD15 and HBME-1 in fine needle aspirates in differentiating benign from malignant follicular thyroid neoplasms.

B. Ziarkiewicz-Wroblewska and A. Wasiutynski

OBJECTIVE: To assess the advantages of using new rapid cytophyslogic staining technique for differential diagnosis of benign and malignant cells of thyroid masses.

MATERIALS AND METHODS: Fine needle aspiration cytology (FNAC) was performed on 120 patients having a different clinical findings of thyroid masses. Two smears were done from the aspirate; 1 of the smears was used for Giemsa stain for morphologic study and the second for a new rapid cytophyslogic leukobase toluidine blue stain, which stains the benign cells in blue while malignant cells do not take the stain (unstained).

RESULTS: All smears of 120 cases show benign results in Giemsa staining technique. Four cases were unstained by the leukobase toluidine blue staining technique, which indicates the malignant cells. These 4 cases were confirmed histologically.

CONCLUSION: From the evidence available it is clear that this staining technique should be performed in routine cytology as a rapid and useful method of differential diagnosis of the tumors.

From Al-Kuwait University Hospital, Sana’a Yemen.
but a negative result does not exclude the diagnosis of follicular carcinoma. The use of both (CD15 and HBME-1) markers with positive reaction with at least 1 of them is a useful tool in the cytologic preoperative diagnosis of follicular tumors.

From the Departments of Pathology and Pulmonology, Medical University of Warsaw, Warsaw, Poland.

P-139 FINE NEEDLE ASPIRATION CYTOLOGY OF MUCOSA-ASSOCIATED LYMPHOID TISSUE (MALT) LYMPHOMAS OF THE THYROID: A REPORT OF 4 CASES

B. E. Haji, K. Kapila, S. S. George, B. A. Ali, D. K. Das and T. A. Junaid

INTRODUCTION: Thyroid lymphomas (TL) are rare. They appear as diffuse, large B-cell lymphomas (DLBCL) (70%) or as mucosa-associated lymphoid tissue (MALT) lymphomas (6–27%). We report 4 cases of MALT lymphoma diagnosed on fine needle aspiration cytology (FNAC) over a period of 16 years.

METHOD: Sixteen cases of TL were retrieved and reviewed from the files of the cytology laboratory, Mubarak Al-Kabeer Hospital from 1989 to 2005. Of these, 4 were suspected to be MALT lymphomas.

RESULTS: Age of the patients ranged from 24 to 60 years with a mean age of 42 years. There were 3 women and 1 man. Two cases had associated cervical lymphadenopathy, which was bilateral in 1 of them. The right and left lobes were equally involved. Two cases presented with hypothyroidism and in 2 the thyroid function tests were not done. The working diagnosis was malignancy in the 2 who had associated lymph nodes. On cytology the possibility of a lymphophoreticular malignancy, possibly MALT lymphoma, was suspected in all of the cases. Of these 4, 3 were confirmed on histology to be MALT lymphomas. Three (75%) of the MALT lymphomas had associated features of florid Hashimoto’s thyroiditis. In 3 cases immunocytochemistry (ICC) on aspirate smears was helpful in reaching the diagnoses.

CONCLUSION: Cytologic diagnosis of MALT lymphomas poses a diagnostic dilemma because they are usually associated with HT. ICC is helpful in identifying suspicious cases.

From the Cytology Laboratory, Mubarak Al-Kabeer Hospital; and Department of Pathology, Faculty of Medicine, Kuwait University, Kuwait, Faculty of Medicine, Kuwait University, Kuwait.

P-140 ASSOCIATION OF TISSUE EOSINOPHILIA WITH HASHIMOTO THYROIDITIS IN FINE NEEDLE ASPIRATION CYTOLOGY SMEARS

S. Kumar

OBJECTIVE: Fine needle aspiration cytology (FNAC) is a first-line investigation in the diagnosis of Hashimoto thyroiditis (HT). Therefore description of new strongly associated cytologic features in addition to the established diagnostic criteria is important in that these will further enhance the diagnostic accuracy. With this background, we describe the association of tissue eosinophilia with Hashimoto thyroiditis in FNAC smears.

MATERIALS AND METHODS: Slides from 40 consecutive FNAC-proven cases of HT were studied for the presence of eosinophilia and compared to slides from 40 cases of colloid goiter, which served as the controls.

RESULTS: Thirty of 40 HT cases showed significant number of eosinophils in the FNAC smears compared to only 1 of 40 among the colloid goiter cases. The difference between these proportions was statistically significant (p < 0.001).

CONCLUSION: These results suggest that tissue eosinophilia in FNAC smears is strongly associated with HT and may be used as an additional diagnostic and discriminatory indicator.

From Memorial Sloan-Kettering Cancer Center, New York, New York, U.S.A.
P-142  CAUSES AND SOLUTIONS IN INADEQUATE THYROID FINE NEEDLE ASPIRATION SAMPLES FOR REVERSE TRANSCRIPTASE POLYMER CHAIN REACTION ANALYSIS

N. Mateša, I. Šamija and Z. Kusic

OBJECTIVE: Reverse transcriptase polymer chain reaction (RT-PCR) is used to detect the expression of different neoplastic markers within samples obtained from thyroid fine needle aspiration (FNA). In most published studies the number of inadequate FNA samples for RT-PCR analysis has not been evaluated. In our study we investigated the causes of inadequate thyroid FNA samples for RT-PCR analysis in attempt to find solutions for better sampling.

MATERIALS AND METHODS: Inadequate FNA samples for RT-PCR analysis were defined as samples with negative GAPDH or Tg gene expression. Thyroid FNA samples of lesions with satisfactory cytologic diagnosis other than of follicular cell origin were excluded. A total of 332 samples for RT-PCR analysis obtained by ultrasound-guided thyroid FNA were investigated. After the aspirate was smeared for conventional cytology, the residual needle material was used for RT-PCR analysis in 215 (65%) cases. In the rest of the cases, separate puncture was undertaken to obtain material only for RT-PCR analysis. Nodules were measured in 194 (72%) adequate samples and in 28 (44%) inadequate samples. Statistical analysis was performed using the \( \chi^2 \) test and Student’s t test. A value of \( p < 0.05 \) was considered significant.

RESULTS: In total, 63 (19%) inadequate samples for RT-PCR analysis were detected, of which 28 (44%) were GAPDH positive but Tg negative. All 10 cases with unsatisfactory cytologic diagnosis were in the category of inadequate samples for RT-PCR analysis (\( p < 0.0001 \)). Samples obtained from separate puncture only for RT-PCR analysis were better than those obtained from residual needle material (\( p = 0.0163 \)). No statistically significant correlation between the nodule size and the number of inadequate samples for RT-PCR analysis was detected.

CONCLUSION: Our results imply a significant number of inadequate thyroid FNA samples for RT-PCR analysis. To decrease this number, we recommend not to continue with RT-PCR procedure on unsatisfactory cytologic material. Better sampling is achieved when separate puncture is carried out for RT-PCR analysis.

From the Department of Oncology and Nuclear Medicine, Sisters of Mercy University Hospital, Zagreb, Croatia.

P-143  FOLLICULAR CARCINOMA OF THE THYROID: EXPERIENCE OF A SINGLE INSTITUTION OVER 16 YEARS

A. Matthews, G. Leiman and T. Trainer

OBJECTIVE: Follicular carcinoma (FC) is regarded as the second most common type of thyroid cancer. Estimates of the incidence of FC vary considerably, which likely reflects differences in geography, among populations, and in the classification of follicular neoplasms over the preceding several decades. Our goal was to determine the relative frequency of FC at our institution in New England over 16 years, applying strict current histopathologic criteria for diagnosis. Corresponding pre-thyroidectomy fine needle aspiration (FNA) specimens were also reviewed.

MATERIALS AND METHODS: Total and partial thyroidectomy specimens at FAHC from 1990 to 2005 with diagnosis of follicular lesion, neoplasm, or carcinoma were reviewed. Complete capsular penetration by tumor or lymphovascular invasion (LVI) within the capsule were required for review diagnosis. Entities excluded from the study included Hürthle cell carcinomas, follicular variants of papillary carcinoma, and adenomas with incomplete capsular criteria. Presurgical FNA biopsies were correlated with the surgical specimen.

RESULTS: Malignant thyroidectomy specimens totaling 441 were diagnosed from 1990 to 2005. The relative frequency of FC over 16 years was 4.3%. A total of 19 cases met review criteria for a diagnosis of FC: 8 cases had complete capsular penetration without capsular LVI, 8 cases had complete capsular penetration with capsular LVI and 3 cases had capsular LVI only. Patient ages averaged 45.5 years (range 16–81), tumor size 3.5 cm (range 1.4–7.3) and more women than men were affected (F:M = 1.7:1). FNAs were performed on 16 cases; 9 were consistent with a follicular neoplasm, 3 with benign thyroid nodule, 2 called papillary carcinoma and 1 nondiagnostic.

CONCLUSION: In addition to changing in the classification of follicular neoplasms, the lack of consensus concerning the definition of capsular invasion in FC has led to considerable variation in the reported incidence of this entity internationally. The relative incidence of FC at our institution over 16 years was 4.3%.

From the University of Vermont/Fletcher Allen Health Care, Burlington, Vermont, U.S.A.

P-144  FINE NEEDLE ASPIRATION CYTOLOGIC FEATURES OF THE METASTATIC TUMORS IN THE THYROID

S. Y. Cho and I. A. Park

OBJECTIVE: It is uncommon to see metastatic tumors in thyroid fine needle aspiration (FNA), and it is sometimes difficult to differentiate from primary thyroid lesions. However, the distinction between metastasis and primary thyroid malignancy is important for further management. Only a few studies have reported the value of cytologic diagnosis of metastasis to the thyroid. We carefully examined the cytologic findings of metastatic tumors to the thyroid, and evaluated previously known helpful findings to discriminate from primary thyroid lesions.

MATERIALS AND METHODS: Fourteen cases of metastatic tumors to the thyroid were retrieved from our pathology files. Aspirates from 13 FNA cases, 4 cases of biopsy or thyroidectomy specimen and their clinical information were reviewed.

RESULTS: The primary tumors were 3 esophageal squamous cell carcinoma, 3 lung adenocarcinoma, 2 lung small cell carcinoma, 3 breast carcinoma, 2 renal cell carcinoma and 1 endometrial adenocarcinoma. Seven cases (50%) were directly diagnosed or suggested as metastasis with FNA, and another 5 cases (36%), which had different cytologic features from conventional primary thyroid neoplasm, were classified as malignant tumor. Only 2 tumors, 1 renal cell carcinoma and 1 endometrial carcinoma, were confused with thyroid follicular neoplasm.

CONCLUSION: This result means that most of metastatic tumors in the thyroid could be diagnosed with FNA with careful interpretation, especially with history of extrathyroidal malignancy. But, metastatic carcinoma can be confused with follicular neoplasm, as it was previously known. Our experience could help cytopathologists in differentiating metastatic tumors from primary thyroid malignancy.

From the Department of Pathology, Korea Cancer Center Hospital; and De-
An 80-year-old man presented with a lump the dimension of which was approximately 4 cm in his right cervical region. Upon ultrasonography, multiple lymph adenomegaly was seen at the same region and a mass lesion of 29x28 mm in the vicinity of thyroid cartilage were seen. At the radiology department, FNAB was performed on the lump and the lymph nodes. The aspirated material’s adequacy was assessed by a pathologist on site. Some of the slides were air-dried for May-Grünwald-Giemsa stain, and some were fixed in ethanol for Papanicolaou staining. A cellblock was also prepared.

**RESULTS:** Upon examination of the slides, tumor cells were seen, most of which were arranged in crowded groups or microfolicles, while in the background some singly dispersed cells as well as sparse, colloid-like material were observed. Most of the tumor cells had fine, vacuolated cytoplasm and round hyperchromatic nuclei in some of which grooves or intranuclear inclusions were observed. Additionally, scant giant cells and squamatoid cells were seen. By the assessment of the cytomorphologic features, a diagnosis of follicular variant of papillary thyroid carcinoma metastatic to right cervical lymph node was rendered. The patient then underwent surgery (without frozen section), and total thyroidectomy and right laryngeal lymph node was rendered. The histology of the tumor in the thyroid was follicular variant of papillary thyroid carcinoma, and 2 of 8 lymph nodes were metastatic.

**CONCLUSION:** FNAB is a reliable method of choice in defining even rare lesions and accuracy mainly depends upon a good aspiration technique and meticulous evaluation of smears.

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**P-146 MALIGNANT TUMORS OF THE THYROID GLAND**

I. Reinmaa and J. Borovskaja

**INTRODUCTION:** Thyroid gland fine needle aspiration (FNA) material was compared to histologic diagnosis, and immunohistochemical markers were used in order to specify histologic diagnosis.

**MATERIALS AND METHODS:** Over 5 years (2001–2005) 42 malignant and 12 suspected malignant lesions in thyroid gland FNA material were diagnosed in East-Tallinn Central Hospital. Patients were aged 14–93 years; 4 were men and 50 women. FNA material was diagnosed, and 33 papillary carcinomas were found, of which 32 were also confirmed by histologic inspection. An elderly patient did not undergo surgery because of her age. Papillary carcinoma was suspected in 10 patients. Histologic inspection confirmed papillary carcinoma in 9 cases and follicular adenoma in 1 case. One patient was diagnosed with follicular carcinoma using atypical cells; histology showed follicular adenoma. Medullary carcinoma was cytologically diagnosed in 6 cases and suspected in 1 case. All of these diagnoses were confirmed histologically. Anaplastic carcinoma was cytologically diagnosed in 3 cases. Two patients had far-advanced tumors and did not undergo surgery. One patient had lung cancer and metastasis to the thyroid gland. Papillary carcinoma with chronic thyroiditis was diagnosed cytologically as well as histologically in 2 cases. Two patients' FNA samples contained an oncocyte variant of papillary carcinoma, of which 1 was confirmed histologically; 1 patient was suspected to have FNA papillary carcinoma tall cell variant, which histologically appeared to be diffuse variant of papillary carcinoma. Immunohistochemical markers were used to specify the diagnosis in histologic research: thyroglobulin, calcitonin, chromogranin and Ki-67.

**RESULTS:** Of 54 suspected malignant and malignant lesions from FNA, 52 (96%) were histologically found malignant.

**CONCLUSION:** FNA is a trustworthy method for papillary, medullary and anaplastic carcinoma. In the case of follicular neoplasm, atypical cells may also occur in follicular adenoma. Immunohistochemical method enables to specify the diagnosis when regular histologic finding is unclear.

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**P-147 THIS ABSTRACT WITHDRAWN FROM THE PROCEEDINGS**

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**P-149 EPIDEMIOLOGIC AND CYTOLOGIC APPROACH FOR EARLY DETECTION AND CONTROL OF RENAL AND URINARY TRACT DISEASES IN RURAL POPULATIONS**


**OBJECTIVE:** The aim of this study is to investigate the value of screening for detection of urinary tract abnormalities in rural areas.

**MATERIALS AND METHODS:** Three routine techniques of urine analysis were performed for a sample of rural persons in 2 villages related to Giza Governorate in Egypt, designated as 1 and 2. These techniques were dipstick testing, microscopic examination of urine and urine cytology. In addition, proliferating cell nuclear antigen (PCNA) and Schistosoma haematobium antigen were investigated in a series of fixed urine samples by immunohistochemical (IHC) staining procedures. Clinical data including history, examination and ultrasonographic assessment of kidneys and urinary tract were evaluated in relation to laboratory urinary findings.

**RESULTS:** Village 2 showed a higher percentages of hematuria, proteinuria, glucosuria and lower urinary tract infection than village 1. Crystalluria in village 1 was higher than village 2 among younger age-groups. Sensitivity of dipstick testing to detect hematuria compared to microscopic examination of urine was 26.6%, while specificity was 78.7%. Lower urinary tract infection detected by cytology showed 44.4% sensitivity and 62.5% specificity compared to pyuria detected by microscopic examination of urine. Hematuria, pyuria and lower urinary tract infection were higher in older age-groups than younger ones. Among those suffering variable urinary abnormalities, schistosome antigen was not detected in any of the fixed urine samples in comparison to corresponding confirmed positive controls. Urine cytology detected urinary tract infection, crystal-
It is reported that a subset of human peripheral blood monocytes that is CD34 positive has pluripotent differentiation ability similar to that of bone marrow stem cells. These CD34-positive cells are able to differentiate into mature macrophage, lymphocyte, epithelial cells or neuronal cells under the influence of various kinds of growth factors. It is well known that pleural or peritoneal fluid contains various kinds of cell growth factors and cytokines for epithelial differentiation. In the present study, we have tried to examine possibility of epithelial differentiation from CD34-positive monocytes or stem cells in the pleural or peritoneal fluid from 9 patients with or without malignant tumors. We examined whether epithelial differentiation of CD34-positive monocytes takes place in the peritoneal or pleural fluid using immunocytochemical analysis. For this purpose, immunocytochemical staining of CD34 and markers for monocytic makers such as CD14 or CD68 were not clearly demonstrated in CD34-positive cells but keratin was revealed in a few of them in 2 cases. CD34-positive cells were found in 3 patients' severely irritated fluids rich in fibrin with or without malignant tumor, 2 of them had few of keratin-positive cells and CD34-positive cells. It is well known that irritation of the body cavity causes an increase in various cytokines and growth factors in the ascites or pleural fluids. Accordingly, expression of keratin in CD34-positive cells in our 2 cases might be related to the phenomenon related to the severe irritation in pleural or peritoneal cavity.

From the Department of Clinical Laboratory, Hikone Municipal Hospital, Hikone; Department of Laboratory Science, School of Health Sciences, Kyoto University, Kyoto; Department of Laboratory Medicine, Shiga University of Medical Science, Shiga; and Division of Diagnostic Pathology, Shiga University of Medical Science Hospital, Shiga, Japan.

P-151 BASIC EXAMINATION OF HER2 GENE IN BREAST CARCINOMA BY CHROMOGENIC IN SITU HYBRIDIZATION: APPLICATION TO FINE NEEDLE ASPIRATION CYTOLOGY SPECIMENS

H. Katayama, S. Maeda, M. Kudo and Z. Naito

OBJECTIVE: To determine the efficacy of trastuzumab (Herceptin), an immunotherapeutic drug for breast carcinoma, it is necessary to analyze the amplification or overexpression of the HER2 gene and its protein. We conducted a basic analysis of the HER2 gene in breast carcinoma using fine needle aspiration cytology (FNAC) specimens by chromogenic in situ hybridization (CISH).

MATERIALS AND METHODS: FNAC specimens obtained from patients with the same type of carcinoma were examined. Among the patients, 10 were determined to carry the HER2 protein (3+) and 5 the HER2 protein (2+) in a tissue of invasive ductal carcinoma as determined by the Hercep test. The specimens obtained by FNA were subjected to direct smearing or washing smearing. After the specimens were fixed with 95% alcohol, tumor cells were identified by Papanicolaou staining. In addition, Region containing many tumors was selected by the cell transfer method and the cancer gene was detected by CISH using a HER2-CISH kit. The CISH hybridizations were evaluated by microscope using a ×40 objective.

RESULTS: Hybridization signals were detected in all 10 patients carrying the HER2 protein, (3+), and amplification of the HER2 gene was observed. Signals were detected in all 5 patients whose carcinoma cells were determined to carry the HER2 protein (2+); however, the amplification of the HER2 gene was observed in only 3 of these patients.

CONCLUSION: CISH using FNAC specimens enables the determination of the presence or absence of amplification of the HER2 gene by light microscopy and permanent preservation of specimens. The specimens treated by washing smearing were easily examined because of the monolayer cells.

From the Department of Pathology, Tama-Nagayama Hospital, Nippon Medical School, Tokyo, Japan.

P-152 EXPRESSION OF CELL CYCLE PROLIFERATION MARKERS (MINI-CHROMOSOME MAINTENANCE PROTEIN 7, TOPOISOMERASE II A AND Ki-67) ON CAVITY FLUID CYTOLOGY: CAN WE DIFFERENTIATE REACTIVE MESOTHELIAL CELLS FROM CANCER CELLS?

F. Kimura, J. Kawamura, S. Kamoshida, K. Kawai, A. Suzuki and S. Kuwao

OBJECTIVE: The cavity fluid cytology was utilized for workup on malignancy, primary survey, implantation degree and clinical staging. We sometimes encounter difficulty in differentiating malignant cells from reactive (mesothelial) cells. Mini-chromosome maintenance proteins (MCMs) as a DNA replication factor plays an important role in cell cycling during late G1 to S phase. Recent studies have reported that MCM proteins are frequently expressed in uterine, pulmonary and gastric carcinomas. We examined immunocytochemical expressions of MCM 7 DNA replicative protein and both topoisomerase II a (Topo IIA) and Ki-67 cell proliferation markers in malignant and reactive (mesothelial) cells obtained from cavity fluids.

MATERIALS AND METHODS: Samples diagnosed as carcinomas or reactive (mesothelial) cells in cavity fluids were examined. Immunocytochemical staining was performed with the universal immunoperoxidase polymer method. Applied primary antibodies included MCM 7, Topo IIA and Ki-67. Ethylenediaminetetraacetic acid (EDTA, pH 8.0) for MCM 7 and citrate buffer (pH 6.0) for Topo IIA and Ki-67 were used for antigen retrieval.

RESULTS: In the reactive (mesothelial) cells, MCM 7 and Topo IIA expression were lower than that of Ki-67. And MCM 7, Topo IIA and Ki-67 had significantly lower expression in reactive (mesothelial) than in carcinoma.

From the Department of Pathology, Theodor Bilharz Research Institute, Giza, Egypt.
IIC and Ki-67 were stained uniformly in nuclei. In malignant cells, MCM 7 and Topo IIA labeling were higher than that of Ki-67. MCM 7 was stained in coarse granular pattern in the nuclei, and Ki-67 stained uniformly in the nuclei.

**CONCLUSION:** Immunocytochemical workup on MCM 7, Topo IIA and Ki-67 expression and labeling patterns can be a reliable tool for identifying malignant cells from reactive lesions in cavity fluid cytology.

From the Division of Diagnostic Pathology and Cytology, Higashi-Yamato Hospital, Tokyo; Fujita Health University School of Medicine, Toyoake; Department of Pathology, Fujita Health University School of Medicine, Central Institute for Experimental Animals, Kawasaki, Japan.

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**P-153 DETECTION OF CHROMOSOMES 21, X AND Y IN UNCULTURED DETECTION OF CHROMOSOMES 21, X AND Y IN UNCULTURED AMNIOCYTES BY USING FLUORESCENCE IN SITU HYBRIDIZATION**

S. Sangkitporn, B. Rerkamnuaychoke, S. Sarasophona, R. Parinayok, P. Noamrot, A. Apilugsanachit, S. Sangkitporn and S. Ajjimakorn

Ammnionitensis of fetal karyotyping analysis has become a part of prenatal diagnosis in many countries worldwide. Conventional cyto genetic analysis of amniocytes is limited by the significant investment of time and labor requires generating sufficiently dividing cells so that chromosome can be analyzed during metaphase. Fluorescence in situ hybridization (FISH) based on interphase analysis with specific DNA probes can provide a rapid and relatively reliable detection of chromosome aneuploidy. In the present report, we investigated the detection of chromosome 21, X and Y from uncultured amniocytes by directly labeled probes in 40 amniocyte samples. Normal XY and XX signals were detected in 20 and 18 amniocyte samples, whereas, trisomy 21 was observed in 1 case. The karyotype of these 59 cases was 46, XX (17 cases), 46, XY (20 cases), 47, XX, +21 (1 case) and 47, XX, +18 (1 case). The other case with 47, XY, +marker karyotype showed mosaicism of disomy and trisomy 21 for 64% and 36%, respectively. The lack of false positive diagnosis in FISH analysis prompts us to consider interphase FISH as a useful tool in pregnancies at high risk for chromosomal aneuploidies. However, the finding of chromosome anomalies undetectable by FISH confirms the need for conventional chromosome analysis. FISH can be used for urgent chromosome 21 and sex chromosome screening tests, followed by a standard chromosome analysis to detect other anomalies.

From the Department of Medical Sciences, Mahidol University, Thailand.

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**P-154 RELATIONSHIP BETWEEN DIFFERENT NEOPLASTIC CERVICAL LESIONS AND FREQUENCY ANEUPLOID CELLS WITH DNA AMOUNT > 5c**

J. Wang, X. R. Sun, D. Y. Che and H. Z. Tu

**OBJECTIVE:** To determine if there is a relationship between high grades of neoplastic cervical lesions and the presence and frequency of aneuploid cells with DNA amount > 5c in cytologic preparations.

**MATERIALS AND METHODS:** A total of 35,610 women were enrolled in the study. Cervical samples were taken by a cervix brush. Cell monolayers were prepared by first washing the brushes in SedFix and following chemical and mechanical treatment of cell suspension to obtain a uniform single cell suspension, the cells were deposited onto microscope slides by cytocentrifugation. Two slides were prepared from each case: one slide was stained by Papanicolaou stain for conventional cytology examination, while the other slide was stained by Feulgen-Thionin method to measure relative amount of DNA in cell nuclei using an automated DNA imaging cytometer.

**RESULTS:** In a total of 35,610 women, 34,149 normal, 924 typical squamous cells of undetermined significance (ASCUS), 1732 low-grade squamous intraepithelial lesion (LSIL) and 162 high-grade squamous intraepithelial lesion (HSIL) were determined by cytology. Aneuploid cells were found in 7% of normal cases, 43% of ASCUS cases, 89% of LSIL cases and in 100% of HSIL cases. All cases of LSIL and HSIL as called by cytology and all cases with at least 1 cell nucleus having DNA amount > 5c (DNA index > 2.5) as determined by automated DNA image cytometer were sent to colposcopy examination and biopsy. A total of 282 cases of cervical intraepithelial neoplasia (CIN) and invasive carcinoma were found. The sensitivity of 59% at the specificity of 80% was calculated for DNA quantitative cytology and sensitivity of 45% at 85% specificity for conventional cytology for CIN2, CIN3 lesions and invasive cancers.

**CONCLUSION:** There is a clear relationship between the severity of the neoplastic cervical lesions and the frequency of aneuploid cells with DNA > 5 c found in cytologic preparations.

From the Lunging Early Cancer Detection Center, Hubei, China.

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**P-155 FINNISH RANDOMIZED EVALUATION TRIAL ON HUMAN PAPILLOMAVIRUS SCREENING**

A. Anttila, L. Kotaniemi-Talonen, N. Malila, M. Hakama, J. Ruokonen and P. Nieminen

**OBJECTIVE:** To evaluate performance and ultimately the effectiveness of primary human papillomavirus (HPV) testing in organized screening for cervical cancer.

**MATERIALS AND METHODS:** Primary testing for oncogenic HPV DNA has been integrated in the Finnish organized cervical screening program with an individually randomized design since 2003. The plan is to invite about 100,000 women in the HPV screening arm during 2003–2008 and another 100,000 in the control arm with conventional cytologic screening; furthermore, 100,000 women are screened and followed in automation-assisted cytologic screening arm. With a follow-up of 3 years since the accrual, we expect to have 80% statistical power to detected 30% marginal effects on subsequent incidence of CIN3+ lesions between the arms.

**RESULTS:** During 2003–2006, approximately 74,300 women have been randomized per arm; the attendance rate in 2003–2004 has been about 65% in all arms. Screening visit information including histologically confirmed findings is available for the first 2 years. In this early data, there is an overall tendency toward an increased detection rate of mild histologically confirmed lesions in the HPV screening arm.

**CONCLUSION:** The conventional Finnish cervical cancer screening program has been markedly effective in reducing the incidence and mortality rates of the disease. Only a rather small additional impact in preventing cervical cancers can be expected with any competing interventions. The effect has been obtained with a
high average specificity and modest numbers of treatments. The early findings on HPV screening suggest high test sensitivity but also increased overdiagnosis of mild preneoplastic lesions. HPV screening can be useful, if the number of lifetime tests can be reduced accordingly. Follow-up can still bring new information, required to justify cost-effectiveness estimates and developments in quality of life.

From the Finnish Cancer Registry, University of Tampere and Helsinki University Central Hospital, Helsinki, Finland.

P-156 VALUE OF CYTOLOGIC SCREENING IN ANTENATAL CLINICS IN ORDER TO PREVENT INVASIVE CARCINOMA OF UTERINE CERVIX IN WOMEN OF A VERY POOR SOCIOECONOMIC AND EDUCATIONAL BACKGROUND

A. Bertini, C. Conz, C. Silva, S. Anjos and M. Mantovani

OBJECTIVE: To present the results of a study of detection by routine cytologic screening in antenatal clinics and management of positive lesions at puerperium. 

STUDY DESIGN: Since 1977 in the Antenatal Clinic at the University Hospital, a Brazilian National Health Service in São Paulo. Specimens for cytology diagnosis were collected during first consultation, regardless of age, parity and period of pregnancy. This paper shows the results of 9,692 pregnant women who attended our antenatal clinics from January 1997 to September 2006. Previous reports are published in Acta Cytologica, 1982 and 1992. To report cervical and vaginal cytologic diagnoses the Bethesda System was used. Only patients with cytologic report of low-grade and high-grade squamous intraepithelial lesions (LSIL, and HSIL) (human papillomavirus [HPV] and carcinoma in situ [CIN1]) or HSIL (CIN2+/HPV– and CIN3+/HPV– and microinvasive) and atypical squamous cells of undetermined significance (ASCUS) – preclinical lesions, were referred for colposcopic or genitoscopy procedures. 

RESULTS: Cytologic diagnoses were: LSIL and HSIL: 744 (7.67%) cases; LSIL: 523 (5.5%) cases; HPV, 294 and CIN3+/HPV– 229 represents LSIL (~70% of the positive cases). HSIL: 221 (2.2%) cases (CIN2+/HPV–, 143 cases; CIN3+/HPV–/75 cases, 3 microinvasive cancer). ASCUS: 104 (~1%) of the cases. HPV was associated with LSIL and HSIL in 80% and 81%, respectively. Among the 9,692 pregnant women, 566 (56.81%) were HPV+. In these cases LSIL and HSIL were 152 (56.81%), with the same association of 80% HPV+. Biopsies were done in 508 (60%) pregnant women with positive and ASCUS cytologic results. We lost follow-up after cytology diagnosis in 40% of the cases (the same result we published in 1982). The cytologic results were compared with histologic diagnosis from biopsies or more definitive results (all cervix studied by histology). The agreement was >90%. The mean age of these cases is 28 years.

CONCLUSION: When we compare the positive cases of cytologic diagnoses with those reported in 1982, the 7.67%, are more than double 3.5%. We continue proving that cytologic screening in antenatal clinics is highly relevant since it gives the obstetrician an opportunity for the early detection and effective treatment of preinvasive and microinvasive cervical lesions of preclinical malignancy, especially in the case of patients under consideration here. The population of the antenatal clinics at our institution exhibit characteristics that allow comparison to those in western industrialized societies, were all the important and available epidemiologic data derived.

From the Antenatal Clinic, University Hospital, Brazilian National Health Service, São Paulo, Brazil.

P-157 HUMAN PAPILLOMAVIRUS DETECTION IN CERVICAL CYTOLOGIC SPECIMENS: COMPARISON OF MY09/11 CONSENSUS POLYMER CHAIN REACTION WITH TYPE-SPECIFIC POLYMER CHAIN REACTION

G. Boulet, C. Depuydt, C. Horvath, I. Benoy, A. Vereecken and J. Bogers

OBJECTIVE: The causal relationship between persistent infection with high-risk human papillomavirus (HPV) and cervical cancer has resulted in the development of HPV DNA detection systems. As the importance of HPV detection in cervical cancer screening rises, the performance of HPV tests should be assessed. The MY09/11 consensus polymerase chain reaction (PCR) targets a 350 base pair conserved sequence in the HPV L1 gene, and can therefore amplify a wide spectrum of HPV types. However, limitations of these consensus primers are evident, particularly in regard to the variability of detection sensitivity among specific HPV types. This study compares MY09/11 consensus PCR with type-specific PCR for the detection of oncogenic HPV types.

MATERIALS AND METHODS: Liquid-based cytology, MY09/11 consensus PCR and type-specific PCR for HPV16/18, 18E, 31/33, 33L1/E6, 35/36/38E7, 39E7, 45E7, 51E7, 52L1/E7, 53E6, 56E7, 58L1/E6, 59E7, 66E6, 67L1 and 68E7 were performed. 

RESULTS: The study population comprised 15,774 patients. Consensus PCR failed to detect 522 HPV types found by type-specific PCR. Failure of consensus PCR was significantly correlated to the different HPV types, of which types 51 (33.4%), 68 (26.7%) and 45 (15.5%) were missed most frequently. The clinical relevance of the missed HPV infections is reflected in the fraction of cases with cytologic abnormalities: atypical squamous cells, cannot exclude HSIL (ASC-H) (5.4%) and high-grade squamous intraepithelial lesion (HSIL) (17.9%). Moreover, follow-up of the 491 patients with MY09/11 false negative cytology samples over a period of 6 years, 7 months resulted in 101 biopsy results of which 30 (29.7%) were diagnosed CIN2+. 

CONCLUSION: Overall, MY09/11 PCR is false negative in 11% of the cases in which HPV was detected with type-specific PCR. This fraction includes cases with clinically important abnormalities, rendering MY09/11 consensus PCR less suitable as a primary screening tool than type-specific PCRs. Mismatch of the MY09/11 primers or disruption of the L1 target as a result of HPV integration causes the false negativity.

From the Laboratory for Clinical Pathology, University of Antwerp, Antwerp, Belgium.
P-158 **UTILITY OF p16INK4a IMMUNOCYTOCHEMISTRY IN LIQUID-BASED CYTOLGY SPECIMENS FROM WOMEN PREVIOUSLY-treated FOR HIGH-GRADE SQUAMOUS INTRAEPITHELIAL LESION**

V. B. Carydis, T. Walker, A. Wing and T. J. Colgan

**OBJECTIVE:** Recent studies have demonstrated the effectiveness of p16INK4a immunocytochemical (ICC) staining in detecting and confirming high-grade squamous intraepithelial lesions (HSIL) in ThinPrep liquid-based cytology (LBC). The objective of this study was to examine whether p16INK4a ICC expression within LBC specimens from women who had been previously treated for HSIL and whose current specimen had been labeled as negative for intraepithelial lesion or malignancy (NILM) provided any additional detection of persisting intraepithelial disease.

**STUDY DESIGN:** The study group consisted of residual LBC specimens from women who had been previously treated for HSIL (n = 25) and whose current LBC test had been interpreted as NILM including marked benign inflammatory changes (BCC). The control group (n = 25) consisted of residual LBC specimens from women with documented HSIL. ICC for p16INK4a was performed on a second ThinPrep™ preparation, and the percentage of positive cells and intensity of immunostaining recorded. The standard LBC preparations for all p16INK4a ICC-positive study group cases and ICC negative control cases were reviewed.

**RESULTS:** All but 1 of 25 (96%) of the HSIL control group were ICC p16INK4a positive. In the study NILM/BCC group, 2 of 21 with adequate LBC residua were ICC p16INK4a positive, and on review both cases were reclassified as having an epithelial abnormality—1 HSIL and 1 atypical squamous cells cannot exclude HSIL (ASC-H). In both of these cases subsequent colposcopic biopsy follow-up did yield HSIL.

**CONCLUSION:** p16INK4a ICC positivity on NILM/BCC LBC residua from patients previously treated for HSIL may identify a small percentage of cases that merit cytologic review and possible cytologic reclassification. The ultimate utility of p16INK4a IHC in this clinical situation does require further study.

From the National Research Center, Giza, Egypt.

P-159 **DETECTION OF HPV16 BY IN SITU HYBRIDIZATION IN PRECANCEROUS AND CANCEROUS LESIONS OF CERVIX**

M. Choudhury and S. Singh

Fifty cervical biopsies from Indian women with preinvasive and invasive malignancies of uterine cervix and 10 normal cervical biopsies were examined for the presence of human papillomavirus (HPV) 16 DNA sequence by in situ hybridization (ISH) method using biotinylated DNA probes. The overall positivity of HPV16 DNA was 48% (24 of 50). The positivity of HPV16 DNA for low-grade squamous intraepithelial lesion (LSIL), high-grade squamous intraepithelial lesion (HSIL) and squamous cell carcinoma (SCC) were 33.33%, 45.45% and 42.30%, respectively. Two cases of adenocarcinoma and none of the normal controls were positive HPV16 DNA. The presence of HPV type 16 in a large number of preinvasive and invasive cervical cancer reaffirms its role in the pathogenesis of cervical neoplasia.

From Lady Hardinge Medical College, New Delhi, India.

P-160 **PROGNOSTIC CORRELATION OF DNA CONTENT, ESTROGEN AND PROGESTERONE HORMONE RECEPTORS IN HUMAN PAPILLOMAVIRUS–RELATED CERVICAL CANCER**

Marwa Elsjaer

The possibility that cervical cancer growth may be related to female sex hormone levels is suggested by several lines of evidence. Cervical cancer is positively associated with breast cancer. However, unlike breast cancer, cervical cancer is much more commonly positive for progesterone receptors than for estrogen receptors. Overall, 70% of cervical cancer specimens have been found positive for progesterone receptor while only 30% were positive for estrogen receptor. Therefore, the clinically and biologically interesting unexpectedly aggressive clinical course of some cervical cancers is a diagnostic dilemma for routine histopathology. Also, the relationship between expression of progesterone with the ploidy determined by image cytometric measurement of DNA content has been interpreted as signs of aggressiveness in the tumor tissue, supporting the possibility of their application as a test for grading and importance in adequate treatment choice.

From the National Research Center, Giza, Egypt.

P-161 **REFLEX HIGH RISK HUMAN PAPILLOMAVIRUS DNA TESTING BY IN SITU HYBRIDIZATION: A STUDY FAVORING INTERPRETATIVE REPORTING OF TEST RESULTS**


**OBJECTIVE:** Laboratories, depending on their practice setting, are using different reporting models for reflex HPV test results. The advantages of the existing reporting models are not clearly elucidated in literature. Both negative and abnormal Pap test results in our laboratory are reported within 2 working days. Reflex HPV test results after atypical squamous cells of undetermined significance (ASCUS) diagnoses are reported once a week as a probabilistic statement by the same cytopathologist who reports abnormal Pap tests. Our goal was to investigate whether switching to the interpretive reporting model could improve cytohistologic correlation statistics in the setting of our laboratory.

**MATERIALS AND METHODS:** In this retrospective study we included 93 patients who underwent colposcopic biopsy following reflex human papillomavirus (HPV) testing. Reflex HPV testing was performed on ThinPrep specimens using chromogenic in situ hybridization high-risk (HR) HPV DNA probe. Cytology and HPV test results were correlated with histologic follow-up diagnoses.

**RESULTS:** A total of 55 of 93 (59%) HPV-tested ASCUS cases were positive (+), and 38 of 93 (41%) were negative (−) for HR HPV DNA. In follow-up biopsies, cervical intraepithelial neoplasia (CIN) was present in 47 of 55 (86%) of ASCUS/HR HPV(+) cases and in 21 of 38 (55%) of ASCUS/HR HPV(−) cases. Follow-up specimens did not reveal intraepithelial neoplasia in 8 of 55 (15%) of ASCUS/HR HPV(+) cases, and in 17 of 38 (45%) of ASCUS/HR HPV(−) cases.
HPV(−) cases. CIN I represented the bulk of specimens with intraepithelial neoplasia, both in the ASCUS/HR HPV(+) group (39 of 47, 83%), and in ASCUS/HR HPV(−) group (19 of 21, 90%). In contrast, CIN II–III was present only in 2 of 21 (10%) of ASCUS/HR HPV(−), and in 8 of 47 (17%) of ASCUS/HR HPV(+) cases.

**CONCLUSION:** The high frequency of CIN I detection in ASCUS/HR HPV(+) cases suggests that interpretative reporting of ASCUS/HR HPV(+) cases as low-grade squamous intraepithelial lesions would improve cytohistologic correlation statistics in our laboratory without affecting either patient care or overall turnaround time in reporting Pap test results.

From East Tennessee State University, Johnson City, Tennessee, U.S.A.

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**P-162 COMPARATIVE ANALYSIS OF HUMAN PAPILLOMAVIRUS L1 CAPSID PROTEIN DETECTION AS PROGNOSTIC MARKER FOR MILD TO MODERATE DYSPLASTIC LESIONS ON CONVENTIONAL SMEARS AND THINPREP MONOLAYERS**

F. Brinkmann-Smetanay, B. Jordan, A. Weiss and H. Griesser

**OBJECTIVE:** A dramatic decline in invasive cervical carcinomas was achieved by cervical cancer screening programs using the Pap smear. The Pap smear is highly effective in detecting preinvasive cervical lesions but not able to predict the outcome. It was shown that HPV L1 capsid protein detection with Cytoactiv is predicting the outcome of human papillomavirus (HPV)-associated early dysplastic lesions. Conversely, Melsheimer has reported that 80% of mild to moderate dysplastic lesions are expressing the L1 capsid protein by using LBC preparations. On routinely performed Pap smears Griesser has reported that 34.5%, respectively 43.6%, and Ackermann that 61.3% of the mild to moderate dysplastic lesions are L1 positive. This different finding raises the question whether L1 capsid protein detection may be influenced by the smear is prepared or whether the rate of positivity is the result of the further behavior (remission or progression) of a lesion.

**STUDY DESIGN:** A total of 300 HPV high-risk positive, mild to moderate dysplastic lesions were randomly selected in 2 groups. One hundred fifty cases were performed as conventional smears, and 150 cases were performed as LBC with the ThinPrep2000 processor and stained with the Cytoactiv Screening Set for the HPV L1 capsid protein.

**RESULTS:** One hundred eight of the 150 conventional smears (median age 33.8 years) and 118 of the 150 ThinPrep monolayers (median age 34.8 years) were positive for expression of the HPV L1 capsid protein. This difference is not statistically significant in the Fisher exact test (p = 0.187). Until today difference in the prognostic significance detecting the L1 capsid protein is visible within both groups (CS and LBC).

**CONCLUSION:** HPV L1 capsid protein detection with Cytoactiv is not influenced by the way how the cervical smear is performed (CS or LBC) but by the outcome (remission or progression) of the early dysplastic lesion.

From the Center of Pathology and Cytodiagnostics and Laboratory for Pathology and Clinical Cytology, Wuerzburg, Germany.

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**P-164 COMPARISON OF HISTOPATHOLOGICAL OUTCOMES OF ATYPICAL SQUAMOUS CELLS (BORDERLINE NUCLEAR CHANGES) BETWEEN CONVENTIONAL AND LIQUID-BASED CYTOLOGY IN CERVICAL SCREENING**

G. Hulman, S. Vryenhoef, Y. Lau and C. Pendlebury

**OBJECTIVE:** To determine whether the proportion of high-grade squamous intraepithelial lesion (HSIL) and low-grade squamous intraepithelial lesion (LSIL) and negative cervical biopsies differ in patients with smears reported as borderline nuclear changes (BNC) in squamous cells, screened conventionally and with liquid-based cytology (LBC). The 2001 Bethesda equivalents of BNC in squamous cells are atypical squamous cells of undetermined significance (ASCUS) and atypical squamous cells, cannot exclude high-grade intraepithelial lesion (ASC-H).

**MATERIALS AND METHODS:** The hospital cervical cytopathology database was searched for patients who had cervical biopsies following smears reported as BNC in squamous cells (ASCUS and ASC-H). The periods studied were January to July 2005 (conventionally screened) and January to July 2006 when the laboratory had completely converted to LBC (SurePath). The categories of biopsy outcome compared were: Normal, LSIL (human papillomavirus [HPV]/mild dysplasia/cervical intraepithelial neoplasia [CIN1]) and HSIL (moderate and severe dysplasia, carcinoma in situ [CIS]/CIN2 and CIN3). The significance of the results was analyzed using the χ² test.

**RESULTS:** A total of 109 patients from the conventional smear group and 59 who had LBC with squamous BNC (ASCUS and ASC-H) had cervical biopsies. The BNC rates for the periods studied were 4.1% (conventional) and 4.4% (LBC).

<table>
<thead>
<tr>
<th>Histopathology</th>
<th>Conventional (January to July 2005) (%)</th>
<th>LBC (January to July 2006) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>86 (7.9)</td>
<td>78 (8.6)</td>
</tr>
<tr>
<td>LSIL (only)</td>
<td>47 (43.1)</td>
<td>44 (49.4)</td>
</tr>
<tr>
<td>LSIL (CIN1)</td>
<td>17 (15.6)</td>
<td>18 (20.2)</td>
</tr>
<tr>
<td>HSIL (CIN2 and3)</td>
<td>37 (33.9)</td>
<td>33 (36.7)</td>
</tr>
</tbody>
</table>

There were significant differences in the biopsy outcomes of the conventional and LBC screened groups, with less HSIL in the LBC group (p = 0.01)

**CONCLUSION:** Borderline nuclear changes in squamous cells (ASCUS and ASC-H) reported in LBC samples is significantly less likely to indicate high-grade squamous lesions than when reported in conventional cervical screening.

From Nottingham City Hospital, Nottingham, U.K.

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**P-165 VALUE OF p16INK4a IN PROGNOSIS OF HUMAN PAPILLOMAVIRUS DYSPLASTIC LESIONS OF THE UTERINE CERVIX**

L. Kampas, R. Valeri, K. Boglou, A. Panagiotou, D. Evangelinos, V. Liberis, K. Kaplanis and C. Destouni

**OBJECTIVE:** The incidence of cervical cancer has sharply declined during the last decades. Despite the success of cytologic cervical screening programs, there are not any clear-cut morphologic criteria for the prognosis of cervical dysplastic lesions. The early detection of the precursors of invasive cervical cancer still represents a
major challenge for most cytopathologists. Currently, the detection of p16INK4a seems to be a poor prognostic factor in cervical intraepithelial neoplasia. p16INK4a is a cyclin-dependent kinase inhibitor and plays a central role in the regulation of the cell cycle. In squamous cervical cancers, overexpression of p16INK4a is induced by HPV and associated with carcinogenesis of cervical epithelia. The aim of the present study is to investigate the value of p16INK4a in the prognosis of precancerous human papillomavirus (HPV) lesions of the uterine cervix.

MATERIALS AND METHODS: A total of 40 cervical smears diagnosed as LSIL (35) and HSIL (5) were included in our study. The specimens were processed by liquid-based cytology (LBC, ThinPrep). We performed p16INK4a immunocytochemical analysis together with high-risk (HR) and low-risk (LR) hybrid capture 2 (hc2) for HPV testing.

RESULTS: p16INK4a was positive in 29 of 40 smears. From the total of 29 positive specimens for p16INK4a, 8 were affected only by HR-HPV, 16 were affected by HR and LR HPV and 5 were negative for hc2 test. From the negative cases for p16INK4a (11), 7 were positive and 4 negative for hc2 test.

CONCLUSION: p16INK4a is expressed in the majority of HR-HPV cases. However, there are few cases positive for p16INK4a but negative in hc2 test. p16INK4a seems to be an invaluable tool contributing to the planning of treatment of precancerous intraepithelial cervical lesions.

From the Departments of Cytopathology and Gynecology, Greece.

P-169 PROGRESSION OF CERVICAL INTRAEPITHELIAL NEOPLASIA, GRADE 2 ESTIMATED BY P16INK4A OVEREXPRESSION AND HIGH-RISK HPV IN SITU HYBRIDIZATION SIGNAL TYPES

M. Omori, A. Hashi, K. Nakazawa, T. Yuminamochi, S. Hirata, R. Katoh and K. Hoshi

OBJECTIVE: We investigated whether progression of cervical intraepithelial neoplasia, grade 2 (CIN2) can be predicted by p16INK4a immunoeexpression and high-risk human papillomavirus (HR-HPV) in situ hybridization (ISH) signal types. If progression of CIN is predictable, only cases with a high risk of cervical cancer will be able to receive treatment.

MATERIALS AND METHODS: Subjects comprised 52 cases of CIN2 diagnosed by colposcopically directed biopsies. They were divided into 3 groups: Group A (n = 28), in which atypical cells disappeared during follow-up; Group B (n = 11), in which CIN2 continued for > 2 years; and Group C (n = 13), in which CIN2 progressed to CIN3. We examined expression of p16INK4a using immunohistochemical dyeing and nuclear HR-HPV signal using the ISH method. Informed consent was obtained from all patients.

RESULTS: Immunoreexpression of p16INK4a was observed in 87% (45 of 52). Degree of p16INK4a immunoreactivity at initial diagnosis was significantly stronger in Group C than in Group A or Group B (p < 0.05). All cases with strong immunoreactivity of p16INK4a progressed. HR-HPV ISH signal was detected in 60% (31 of 52), and only punctate signal was detected in 21% (11 of 52). Only punctate signals were observed at initial diagnosis more frequently in Group C than in Groups A or B (p < 0.01). No cases with punctate signals were observed. None cases with diffuse ISH signal occurred. CIN2 in which both moderate-to-strong immunoreactivity of p16INK4a and punctate signal (punctate only or mixed) had been observed simultaneously progressed to CIN3 in 91% of cases. Ninety-two percent of CIN2 cases with both negative-to-weak immunoreactivity of p16INK4a and negative or diffuse ISH signal were regressed.
P-171 11 YEARS OF EXPERIENCE IN MOLECULAR BIOLOGY (HYBRID CAPTURE) IN A CYTOLOGY LABORATORY

M. Socias, F. Fernandez, V. Toro, M. Gonzalez, J. L. Lama, E. Olave, T. Socias and A. Lizama

Since 1995, we have performed 15,585 Hybrid Capture tests with 72.5% negative and 27.5% positive results in the detection of human papillomavirus (HPV). The technique of Hybrid Capture was used in our laboratory until the year 2000, with a total of 8,576 tests, of which 8.8% were positive. The greater indication for these tests was screening in women with no previous pathology. Starting in 2001, our laboratory implemented the Hybrid Capture 2 technique, by which, to date, 7,009 tests were performed, with 46.9% positive results. Of these HC2 tests, 94% were performed in women 6% in men. The sampling in women was 96.8% in the genital system, 2% anal, 0.8% oral and 0.4% skin. The sampling in men was 66.2% in the genital system, 18.5% anal, 14.4% oral and 0.7% skin. Average female age was 37.3 and average male age was 36.6. The main indications of the testing of female genital samples were screening, 73.8% clinical and colposcopic suspicion of HPV infection: HPV 16/18; Pap ASCUS, 16.7%; low-grade Pap Lie, 23.1%; high-grade Pap Lie, 2.1%; Pap Ca invader, 2.1%; and posttreatment control of HPV infection, 38%. The results of HC2 are analyzed for each of these indications. The main indication in male sampling was clinical, colposcopic, cytologic and HC2-positive diagnosis of HPV infection in male. The distribution of positive results of male HC2 tests is analyzed in this study.

From the Clinica Alemana, GINOBS, and Hospital Naval, Chile.

P-172 CLINICAL APPLICATION OF MOLECULAR BIOLOGY: 7,009 STUDIES

M. Socias, F. Fernandez, V. Toro, M. Gonzalez, J. L. Lama, E. Olave, T. Socias, A. Lizama and C. Wohler

The main HC2 indication in our patients was for positive Pap test, with 42%. The second indication frequency of this test was post-treatment control of human papillomavirus (HPV) infection, with 38%. Clinical or colposcopic suspicion of HPV infection was found in 12.2% of tests, and only 7.8% were performed as screening of women with no previous background. The HC2 test was positive in 60% of women under age 30 years and 45% of women over 31. HC2 sensitivity of low-grade Lie was 19% greater than cytology and 7% greater in high-grade Lie. Colposcopic correlation with HC2 was 92%. This study analyzes 2,424 HC2 tests in 517 female patients treated and controlled for HPV infection, with a follow-up of up to 7 tests. We studied the behavior curve of the viral charges and their colposcopic and cytologic correlation. The presence of genital HPV infection was studied in men whose mates had the infection, as was the presence of anal and oral HPV in homosexuals.

From the Clinica Alemana, GINOBS, Hospital Naval, and BIOMER, Chile.

P-173 CELLULAR IMMUNITY ALTERATIONS IN HYPERPROLACTINEMIA

P. Vigil, M. J. del Rio, M. Socias, A. Gonzalez and J. Honeyman

OBJECTIVE: Prolactin is a 199-aa polypeptide hormone secreted by the adenohypophysis, whose main function is stimulating secretion of milk from the mammary glands during nursing. Hyperprolactinemia is defined as an excess of prolactin, usually involving galactorrhea and menstrual irregularities. However, prolactin is also important for the immune system, specifically regarding the proliferation and maturation of T lymphocytes. Some studies have demonstrated the secretion of a bioactive prolactin by T lymphocytes. Prolactin and TRH receptors have additionally been identified in T lymphocytes. TRH acts as a prolactin-releasing factor under normal conditions; it would stimulate the secretion of prolactin by the hypophysis and lymphocytes. Abnormalities in the secretion of prolactin, therefore, could affect the immune response. This immune alteration could predispose to the development of histopathologic alterations in human papillomavirus (HPV)+ patients. The purpose of this study was to investigate the immune alterations seen in hyperprolactinemia and their possible consequences in HPV infection.

MATERIALS AND METHODS: By flow cytometry, lymphocyte subpopulations were determined in 36 patients with hyperprolactinemia.

RESULTS: A decrease in the CD8+ cytotoxic lymphocytes was observed: from a normal range of 300-900 (mm3) to a mean of 490 (mm3) and from a normal range of 31–40 (%) to a mean of 26.5 (%) in these patients. Besides, an intensified relationship between CD4+/CD8+ lymphocytes (from 1 to a mean of 1.7) was found.

CONCLUSION: The abnormalities discovered in the T lymphocyte subpopulations showed a decrease in CD8+ cytotoxic lymphocytes in patients with hyperprolactinemia. In preliminary studies an increase in the prevalence of histopathologic alterations in HPV+ patients with hyperprolactinemia has been observed. This could be related to the immune cellular alterations seen in these patients.
P-174 USEFULNESS OF KOILOCYTOTIC ATYPIA AS A PREDICTIVE FACTOR OF SQUAMOUS INTRAEPITHELIAL LESION WITH HIGH-RISK HUMAN PAPILLOMAVIRUS INFECTION

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BACKGROUND: Human papillomaviruses (HPVs) are etiologic agents of cervical cancer. Cervical cytology has been shown to have great utility as a screening tool, with better specificity but somewhat lower sensitivity than testing for HPV DNA. The aim of this study was to develop a sensitive and specific method for detection and typing of HPV infection using the appearance of koilocytes on cervical Pap smears.

MATERIALS AND METHODS: Of the patients who visited the Department of Obstetrics and Gynecology at Teikyo University Mizonokuchi Hospital over a 5-year period starting in November 2000, 435 patients with atypical squamous cells were selected randomly for the current study. Cytologic specimens were collected and smeared using conventional protocols. The cytotechnicians were not informed of the results of HPV DNA test at the time screening in a blind study manner. Cytology results of Pap smears were compared with the results of Hybrid Capture II (HC2) for the detection of HPV DNA. Correlation was assessed, and discordant cytology results were reviewed.

RESULTS: The HC2 assay for low-risk HPV DNA revealed that low-grade squamous intraepithelial lesion (LSIL) showed higher value than atypical squamous cells (ASCs), significantly. However, there was no significant difference between any groups of cytologic diagnosis in the assay for high-risk HPV DNA. Koilocytes on Pap smears were morphologically divided into 4 types: ordinary type, bubble type, clear type and dyskeratotic type. Ordinary-type koilocytes were usually found in smears from HPV-infected cases and were considered potential cytodiagnostic clues of HPV infection. Prospective follow-up study of 96 cases demonstrated that bubble and dyskeratotic types of koilocytes were mostly found in smears from intractable or regressed cases, whereas clear-type koilocytes were correlated with progression.

CONCLUSION: This method can also be applied easily to analysis of cytologic samples and therefore also allows type-specific follow-up of women who have been treated for intraepithelial squamous lesions.

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P-177 COMPARISON OF UNSATISFACTORY ASPIRATES IN FINE-NEEDLE ASPIRATION PERFORMED BY SURGICAL MEDICAL OFFICERS AND PATHOLOGISTS

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OBJECTIVE: The evaluation of fine needle aspiration cytology (FNAC) is often performed by surgical medical officers who do not have proper training in aspiration techniques. The aim of this study was to compare the proportion of unsatisfactory aspirates obtained by surgical medical officers and pathologists.

MATERIALS AND METHODS: FNAC case reports were retrospectively reviewed from our laboratory records. Cases were grouped according to organ or site and person who performed the FNAC procedure. An aspirate was deemed adequate when a diagnostic report was issued; and unsatisfactory when a report contained terms such as “unsatisfactory sample” or “inadequate cellularity for interpretation.”

RESULTS: Of a total of 1,248 FNAC reports reviewed, 610 (51.2%) by pathologists. The most common organs subjected to FNA procedure. An aspirate was deemed adequate when a diagnostic report was issued; and unsatisfactory when a report contained terms such as “unsatisfactory sample” or “inadequate cellularity for interpretation.”

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lymph node 21.3%; for pathologists, the proportion was: breast 7.3%, thyroid 4.6% and lymph node 4.4.

CONCLUSION: Pathologists had a significantly lower proportion of unsatisfactory FNA samples compared to surgical medical officers. Thus the pathologists intend to provide hands-on training in aspiration techniques for medical officers. We also plan to study the role of cytospin smears and cellblocks in bloody thyroid aspirations in view of improving cell yield.

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P-180 QUALITY IMPROVEMENT PROGRAM OF CERVICOVAGINAL SMEARS IN TAIWAN

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OBJECTIVE: Cervicovaginal smear (Pap smear) interpretation is a highly successful, albeit imperfect, test for the detection of cervical cancer and its precursors. The importance of a quality improvement program can never be overemphasized. The current status and quality improvement program of Pap smear in Taiwan was evaluated and the impact on cervical cancer prevention determined.

MATERIALS AND METHODS: All the information of Pap smears done in 2004, ~ 2.3 million, was retrieved from the national Pap smear database regulated by the Bureau of Health, Department of Health, Executive Yuan, Taipei, Taiwan. The subsequent histologic examination and the management within 6 months were also retrieved for study from the same data bank. One hundred accredited cytopathology laboratories entered the quality improvement program. The purpose of this study was to evaluate the effect of the current national quality improvement program conducted by the Cytology Committee of Taiwan Society of Pathology, including information system, laboratory accreditation, personnel training and the screening accuracy.

RESULTS: The laboratory accreditation system is similar to that of the College of American Pathologists. The coverage of Pap smear, both diagnostic and screening, over 30 years old was 54%. The positive rate of Pap smears, composed of atypical squamous cells, cannot rule out high-grade squamous intraepithelial lesion (HSIL) (ASC-H), squamous intraepithelial lesion (SIL), cancer, AIS, atypical glandular cells of undetermined significance (AGUS) (ASC not included was 1.5%. The rate of complete follow-up (including tissue diagnosis and management) among those patients whose Pap smears showing HSIL and up was 96%. The cytologic-histologic correlation revealed sensitivity 82%, specificity 90%, positive predictive value 83% and negative predictive value 89%.

CONCLUSION: The Pap smear screening and practice of cytopathology in Taiwan are under thorough monitoring by the National Quality Improvement Program. The advancement in the field of cytopathology will hopefully lead to successful cervical cancer screening.

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P-181 NO INCREASE IN INCIDENCE OF INTERVAL CANCERS IN THE NETHERLANDS AFTER IMPLEMENTATION OF A LESS RESTRICTIVE DEFINITION OF A NEGATIVE PAP SMEAR

M. Rebolj, M. van Ballegooijen, M. Essink-Bot, R. Boer and D. Habbema

OBJECTIVE: In 1996 in the Netherlands, a less restrictive definition of a negative Pap smear was implemented such that the sole inflammation of the epithelium and the presence of specific microorganisms do not anymore qualify as abnormal. As a consequence, by 1998 the proportion of negative primary screening smears increased, and the proportion of borderline smears decreased from 10% to 2%. We evaluated whether this change led to an increase in cervical cancer incidence.

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the interval cancer rate.

MATERIALS AND METHODS: Information on all cervix uteri examinations in the Netherlands was retrieved from the nationwide registry of histopathology and cytopathology (PALGA). Woman-years at risk (WY) were counted from the date of the first negative smear to the date of the following negative smear, the diagnosis of cancer, first nonnegative smear or biopsy for women aged 30–64 in periods 1994–1997 and 1998–2002. All cancers originating from the cervix were counted. Interval cancer rates by time since the previous negative smear were age-standardized (ESR).

RESULTS: We analyzed 192 and 93 invasive cancers, and 3.5 and 3.2 million WY in 1994–1997 and 1998–2002, respectively. At an average of 3 cases per 100,000 WY in 1998–2002, the interval cancer rates showed a statistically nonsignificant decrease compared to the previous period. The number of previous negative smears did not substantially alter the risk for cancer.

CONCLUSION: The interval cancer rate did not increase in the early period of implementation of a less restrictive definition of a negative smear, and the sensitivity of the smear was not jeopardized by this change. There is a need for continuous monitoring of the interval cancer rates.

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P-182 NO EXCESS CANCER INCIDENCE IN WOMEN WITH A NEGATIVE TRIAGE AFTER BORDERLINE OR MILDLY DYSKARYOTIC SMEARS

M. Rebolj, M. Van Ballegooijen, L. Essink-Bot, R. Boeck and D. Habbema

OBJECTIVE: Women with borderline or mildly dyskaryotic (BMD) smears are advised to rejoin the regular 5-yearly screening program after they had 2 consecutive negative Pap smears. We evaluated their 5-year incidence of subsequent invasive cervical cancer.

MATERIALS AND METHODS: Information on all cervix uteri examinations in the Netherlands was retrieved from the nationwide registry of histopathology and cytopathology (PALGA). We identified women with the first occurrence of BMD smear abnormally followed by 2 subsequent negative smears and without any preceding cytologic or histologic abnormality. Women were censored at the cancer diagnosis or if they had any subsequent abnormality. For the period 1994–2002, the age-adjusted cumulative 5-year incidence of invasive cancer for these women was compared to that of women with complete negative screening histories.

RESULTS: We identified 46,000 women with a satisfactorily completed follow-up after the first BMD abnormality, 10 of these developed cancer within 5 years. Among 1.24 million women with negative smears, 356 developed invasive cancer. The age-adjusted 5-year cumulative incidence of cancer in women with negative triage was 2 per 10,000 women and not significantly higher than among women with completely negative screening histories.

CONCLUSION: These preliminary results suggest adequacy of the current recommendation for the women with a BMD smear and negative triage to rejoin the regular 5-yearly screening round.

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P-183 TRIAL OF 3-D RECONSTRUCTION OF TISSUE FROM ENDOMETRIAL SMEAR

K. Yoshida, M. Osada, M. Inoue and N. Nakashima

OBJECTIVE: We tried to reconstruct an endometrial change induced by treatment by TAM (Tamoxifen, antiestrogen agent), used for breast cancer postoperatively.

MATERIALS AND METHODS: Two cases were treated by TAM, 1 before menopause and another postmenopause. Endometrial cytomsears, which were obtained 6 times a case of 3-6 months interval by endocytobrush stained Papanicolaou stain, making 18 slides in all. Microscopically cell masses (> 100 μm in diameter), cell sheet, individual cells were seen. Especially cell masses were observed in detail, and the surface tall columnar epithelial cell layer, endometrial stromal cells, structure of endometrial glands and capillaries were drawn on a paper. Moving the focus of microscope, made a next drawing and make a third drawing so on (about 5 drawings/cell masses). These drawings included cell size, nuclear to cytoplasmic ratio and cell morphology. Putting a drawing on another one in sequence, a cell mass structure was reconstructed. Twenty-four cell masses in the 2 cases were drawn.

RESULT: These reconstructed drawings were put in order, and then the chronologic endometrial changes induced by TAM treatment were comparatively easy to grasp.

CONCLUSION: To diagnose the endometrium from endometrial smear, it is necessary to reconstruct from dispersed cells and cell masses. The reconstruction of tissue is often difficult, but a 3-D drawing from cell masses shown here make a clear image and turn out to be effective.

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P-184 UTILITY OF THE GASTROINTESTINAL TRACT BRUSHING CYTOLOGY: ANALYSIS OF 561 CASES

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OBJECTIVE: To assess the usefulness of brush cytology performed by endoscopic techniques for diagnosing gastrointestinal (GI) tract lesions.

MATERIALS AND METHODS: A total of 561 endoscopic-guided gastrointestinal brushings from 524 patients performed over 4 years were reviewed and correlated with 339 forceps biopsy specimens obtained during the same procedures.

RESULTS: Brush sampling was carried out in the esophagus (20%), stomach (14%), large intestine (58%) and small intestine (7%). Among 561 cases, 199 (35.5%) were negative, 345 (61.5%) malignancy-positive or suspected, and 17 (3%) unsatisfactory. Most cases corresponded to neoplastic lesions (297 [87%] adenocarcinomas and 12 squamous carcinomas) or infectious processes (72 from esophageal samples and one anal brushing that revealed Entamoeba histolytica infection). Some of the remaining lesions included gastrointestinal stromal tumor, lymphoma, lipoma, and posttreatment or reparative changes. In 28 (5%) cases, brushing was diagnostic, whereas biopsy samples were negative. Final results showed 12 false positive diagnoses, mainly associated with reparative epithelial changes, and 9 false negative diagnoses related with sampling errors. The overall sensitivity, specificity and diagnostic accuracy of the method were 97.3%, 94% and 93.3%, respectively.

CONCLUSION: Brush cytology of the GI tract performed by ex-
experienced cytopathologists showed high diagnostic accuracy in this large case series. The technique complemented and increased the diagnostic precision of biopsy alone and substituted biopsy in some cases. The diagnostic benefits of this method can be explained by the large sampling area covered by the brush as compared to forceps biopsy, and by the ease with which the brush can reach structures that are difficult to access with forceps (e.g., stenoses). Brush cytology is also highly useful for detecting infectious agents.

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P-185 APPLICATION OF THE FISH METHOD IN BLADDER CANCER DIAGNOSTICS AND MONITORING

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OBJECTIVE: Bladder cancer is one of the most prominent malignant cancers in men. The incidence of bladder cancer is about 4 times higher in men compared to women. As many as 60% of patients will experience recurrence over a 5-year period. Seventy percent of bladder cancers are discovered while they are still superficial and amendable to intervention. Therefore an early, highly sensitive diagnostic test is an important part of disease management.

MATERIALS AND METHODS: Fluorescence in situ hybridization (FISH) was used to detect cells with chromosomal alterations.

RESULTS: A group of 47 patients, 23 men and 24 women, was examined. A pathologic finding was identified in 40% of patients; chromosome aneuploidy was found in 53.85%, and deletion of the place 9p21 at both chromosomes was found in 46.15%. Sixty percent of patients reported normal findings. A total of 31.9% of samples could not be assessed because criteria for assessment applying the UroVysion test were not met due to a small material cellularity.

CONCLUSION: The examination applying the FISH method using urine samples in patients in whom a bladder cancer diagnosis or disease recurrence is suspected is a very sensitive, noninvasive method supplementing standard cytologic and cystoscopic examinations. A combined sensitivity of these examinations varies in a range of 89% for cystoscopy and cytology and up to 97% for cystoscopy and FISH. An early detection of this disease at a molecular level is a significant factor influencing the interval of survival of patients suffering from bladder cancer.

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