Diagnostic Clues in Fine Needle Aspiration Biopsy of Hydatid Disease of Bone

To the Editors:

Diagnosis of hydatid disease (HD) is usually based on its clinical and radiologic presentation. However, radiologic appearances of bone lesions are nonspecific and mimic inflammatory diseases and neoplasms. Despite limited experience with fine needle aspiration biopsy (FNAB) in the evaluation of cystic bone lesions, HD is diagnosed in cytology. A 33-year-old woman presented with right hip pain for the previous 4 months. Radiologic findings were not diagnostic but conclusive about an inflammatory or neoplastic lesion limited to the iliac bone. FNAB revealed a highly viscous, yellowish liquid. On microscopy, rare osteoclastic multinucleated giant cells in a hemorrhagic background were detected. The cytologic diagnosis was inconclusive, and tissue biopsy was recommended. The preoperative clinical diagnosis included HD. The histopathologic diagnosis was HD. Review of the FNAB slides revealed a few fragments of acellular, laminated membrane (Figure 1).

Primary osseous HD infestation, particularly of pelvic bones, is rare, occurring in 0.5–4% of cases. A conclusive preoperative diagnosis is possible in only half the cases. The differential diagnosis includes chondromyxoid fibroma, malignant fibrous histiocytoma, multiple myeloma, giant cell tumor, aneurysmal bone cyst, tuberculosis and metastases.

Despite previous reports of spillage of cystic fluid, leading to anaphylactic shock or dissemination of disease, FNAB has been used rather safely in many cases of HD for diagnostic and/or therapeutic purposes. The cytopathologic characteristics are protoscolices, hooklets and/or fragments of the acellular laminated membrane. Osteoclastic giant cells are also seen in many lytic and neoplastic bone lesions and are not diagnostic alone.

In FNAB of bone lesions, osteoclastic giant cells scattered in a hypocellular or hemorrhagic background should alert the cytopathologist to search for other findings diagnostic of HD. Laminated membranes should not be neglected as they might be the only diagnostic clue to the diagnosis.

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An Unusual Protozoon as a Contaminant in a Sputum Smear

To the Editors:

Free-living amebae are associated with human infections. Furthermore, the role of tap water contamination from these microorganisms is well known. The purpose of this letter is to describe the presence of a special type of ameba (thecamoeba) as a contaminant in a sputum smear stained with Papanicolaou stain and observed in routine screening.

Testate amoebae, or Thecamoebians (Rhizopoda), are common inhabitants of moist soil, wetlands, lacustrine habitats and freshwater. They produce a decay-resistant shell that protects the cell from desiccation. The shell may be proteinaceous, siliceous or calcareous and may incorporate extraneous material, such as diatoms and mineral grains. These organisms are known to be good indicators of moisture levels in soils and acidity in lakes.

Figure 1 shows the shell of a thecamoeba in a sputum smear. We can observe the rounded shape and reticulated appearance. In 1 of the extremes it has an aperture and is covered with quartz particles and diatoms. Observation of such a structure outside the microscope focus can lead one to think that it represents extrinsic contamination of the sample when the sputum passed through the oral cavity or during the staining process. (Tap water is used with Papanicolaou stain.)

Although not a frequent occurrence, the presence of protozoa in slides that had been washed with tap water has been reported. During microscopic examination, when meticulous screening is performed and a search is made with a firm understanding of the morphologic characteristics, it is possible to observe contaminants that are unrelated to the purpose of the examination.

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Bone Metastasis of a Gastrointestinal Tumor with Diagnosis by Fine Needle Aspiration Biopsy

To the Editors:

We would like to report an unusual case of gastrin-
smears, tumor cells were held together by pink collagenous and magenta myxoid stromal matrix.

The core biopsy also showed fascicles of relatively uniform spindle cells separated by myxoid and collagenous stroma (Figure 4). Mitotic figures were seen, and necrotic areas were also present. The tumor cells were immunoreactive to CD34 and CD117 (Figure 5). Cytokeratin (CK), smooth muscle actin (SMA) and desmin were not expressed.

The resected intestinal mass was a 106-g, 7 × 7 × 5-cm, ovoid soft tissue tumor. Histologically it consisted of spindle cells arranged in fascicles in a fibrocollagenous and myxoid stroma. Two mesenteric lymph nodes were involved by the tumor, 1 by direct extension of the tumor; the other harbored metastatic foci of tumor. Mitotic activity was brisk (range of 4–8 per
10 high-power fields in cellular areas), and foci of necrosis were identified. Repeat immunocytochemistry (ICC) on the tumor showed a similar immunophenotype (CD34 and CD117 positive, and CK, SMA and desmin negative).

GISTs are mesenchymal neoplasms that usually arise in the gastrointestinal tract anywhere from the esophagus to the anorectal region. They may present with variable histologic subtypes but are unified by a common expression of c-kit (CD117), usually demonstrated by ICC. Malignant GISTs often spread to the liver, peritoneum and regional lymph nodes and rarely to the lungs, pleura, subcutis and bone.

The variable cytomorphologic appearance of primary GISTs has been well described and follows the wide spectrum of histologic types of GISTs. The commonly encountered histology is spindle cell type, but epithelioid and pleomorphic types are occasionally encountered. The smears are usually cellular, and tumor cells may present as clusters, often in 3-dimensional forms or singly scattered. Myxocollagenous stroma and capillaries are often seen associated with the tumor cells. Palisading of neoplastic cells is commonly noted. The ovoid to spindled and often wavy nuclei have blunt or tapered ends and are more or less uniform in size; pleomorphism is unusual. Nuclear grooves may be seen. Intranuclear inclusions can be prominent, particularly for epithelioid variants. Cytoplasm is gray to pale blue, delicate and fibrillary. In epithelioid types, the cells have eosinophilic or amphophilic cytoplasm.

Similar cytologic features are noted in metastatic GISTs, and expression of CD117 by the tumor cells confirms the diagnosis. In the absence of c-kit reactivity by ICC, c-kit mutations and platelet-derived growth factor α (possible oncogenic pathway for GISTs in the absence of c-kit mutation) can be established by polymerase chain reaction amplification and DNA sequencing analysis.

In a large series of GISTs, spread to the bones is infrequent, representing only 2–4% of metastatic disease. In a study by DeMatteo et al, of 94 patients with metastatic disease, only 6 had bone metastasis, while in a study by Burkill et al, of 83 patients with metastatic disease, only 2 had bone metastasis. By far the most common sites of metastasis are the liver and peritoneum. Retroperitoneum, lungs and regional lymph nodes may also be involved during the evolution of the disease.

On cytology alone, the differential diagnosis of GISTs is broad and includes spindle cell neoplasms, epithelioid lesions and pleomorphic tumors. Among these entities, metastatic carcinoma is frequently encountered as a lesion metastatic to the bone. Prominent cytoplasmic vacuolation of tumor cells in GISTs have been reported and may be misinterpreted as cells of mucin-producing adenocarcinoma. The other common mimics are smooth muscle and peripheral nerve sheath tumors and, rarely, melanoma. Inclusion of antibodies in the ICC panel known to be expressed by these tumors in the differential diagnosis, such as CK for carcinomas; desmin and SMA for smooth muscle neoplasms; S-100 protein for nerve sheath tumors; and S-100 protein, HMB45 and melan-A for melanoma is usually necessary to establish a definitive diagnosis.

Since other neoplasms, including melanoma, extraskeletal myxoid chondrosarcoma, Ewing sarco-
ma/malignant peripheral neuroectodermal tumor, melanotic schwannoma, angiosarcoma, epithelioid sarcoma and lung/pleural tumors, may be CD117 positive, careful attention to the distinctive cytomorphologic features of each of these entities, judicious use of immunocytochemical stains and correlation with clinical findings should be employed to arrive at the correct diagnosis.

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Interaction Between Trichomonas vaginalis and Human Spermatozoa in the Female Genital Tract: Papanicolaou-Stained Cervical Smear Findings

To the Editors:
We would like to report a case of phagocytotic interaction and agglutinated human spermatozoa by trichomonads, a phenomenon encountered in a Papanicolaou-stained cervical smear under light microscopy.

A 40-year-old woman was referred to our institute’s endocrine infertility clinic for investigation and management of secondary infertility of 9 years’ duration. She had had 1 spontaneous abortion and 1 stillbirth. Her menstrual cycles were normal. On physical examination the patient was healthy, with a blood pressure of 120/70 mm Hg. Her per speculum examination did not reveal any abnormal discharge, and the cervix looked healthy. A cervical smear from the squamo-columnar junction collected and stained by the Papanicolaou technique showed an unusual finding of phagocytotic interaction of spermatozoa by trichomonads (Figure 1) and agglutinated spermatozoa (Figure 2).
Trichomonads, as etiologic agents of vaginitis, were first considered by Alexandra Donne in 1836. They are unicellular, flagellated protozoal parasites and can be small (7–13 μm) or large (20–30 μm). They ingest bacteria, yeast and erythrocytes by phagocytosis. This biologic process may proceed from any part of the body and is the principal mode of nutrition. Studies using electron microscopy have shown phagocytosed Döderlein bacilli and diplococci in the cytoplasm of this parasite, whereas in in vitro studies phagocytosis of human lactobacilli has been reported. Phagocytosis of human erythrocytes, rod-shaped bacteria and cocci by trichomonads has been observed also under light microscopy. Sexually transmitted microorganisms, such as Neisseria gonorrhoeae, Mycoplasma, Chlamydia trachomatis and Escherichia coli, attaching to human spermatozoa and their role in ascending infections in the female genital tract, resulting in pelvic inflammatory diseases and infertility, have been reported. Trichomonads may also serve as a vector for bacterial pathogens that attach to its surface. In addition, they may be destructive to spermatozoa by phagocytosing them.

To the best of our knowledge, this is the first observation of the early stages of phagocytic interaction of trichomonads with human spermatozoa and in which agglutination of spermatozoa has been detected. A cervicovaginal smear is a Pandora’s box and can hold numerous surprises. The above findings emphasize the fact that one should remain aware of rare parasites besides Trichomonas vaginalis in routine cervicovaginal Pap smears. One also should be aware of in situ biologic interactions between pathogens and host, which can be visualized on Pap smears.

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Pulmonary Echinococcosis Complicated with Actinomycotic Abscess: A Rare Fine Needle Aspiration Diagnosis

To the Editors:
Pulmonary involvement in echinococcosis is seen in 20% of cases in endemic regions. While almost half of these remain asymptomatic, a few present with fatal complications due to rupture of the cyst. That may be difficult to diagnose due to loss of the characteristic radiologic appearance.2,3

We report here a case of pulmonary hydatid disease complicated with actinomycotic lung abscess diagnosed on fine needle aspiration cytology in a suspected case of tuberculosis. To the best of our knowledge, the diagnosis of the 2 infections/infestations together on cytology has not been reported previously.

A 10-year-old boy presented with a history of cough, low grade fever, weight loss and loss of appetite for last 6 months. On examination he was grossly anemic. Chest radiography revealed a nodule in the lower lobe of the right lung. A provisional diagnosis of pulmonary tuberculosis was made. On ultrasound examination, a single lesion with mixed echogenicity was seen in the lower lobe of the right lung and was subjected to guided fine needle aspiration. Cytologic examination of the Giemsa-stained smears showed a background of mixed inflammatory cell infiltrate. In addition, many refractile, dagger-shaped hooklets of Echinococcus, measuring 18–35 μm were identified (Figure 1). No scolices or laminated membrane was found even after a thorough search. In 1 of the smears, darkly stained, cotton wool–like colonies suggestive of Actinomyces were also seen (Figure 2). This smear was destained and restained with Gram stain, which revealed Gram-positive, filamentous structures consistent with actinomyces. Based on the cytomorphologic features, a diagnosis of hydatid disease of the lung with actinomycotic abscess was given.

With the cytologic diagnosis in mind, the patient was reexamined; however, no evidence of cervicofacial or pelvic actinomycosis was found, proving that the Actinomyces in this case presented as a primary lung infection. The patient responded to standard treatment within 6 weeks.

Though fine needle aspiration is not the preferred procedure for diagnosing Echinococcus, there are several reports in the literature on the cytodiagnosis of this infestation at various body sites.4-6 The pathognomonic cytomorphologic features of the hydatid—that is, the characteristic hooklets, scolices and laminated membrane—can be easily recognized on a smear. An associated bacterial infection may result in disintegration of the membrane, but the hooklets withstand it and are still identifiable in the inflammatory background,7 as seen in our case. The associated bacterial infection in the present case proved to be actinomycosis, which is rare as a cause of a primary pulmonary infection. Fine needle aspiration cytology proved instrumental in the diagnosis of 2 clinically unsuspected lung lesions, prompting successful treatment and preventing serious complications.

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