Sonographic Appearances of Malakoplakia in the Urinary Tract
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Introduction
Malakoplakia is a rare form of granulomatous inflammatory disease characterized histologically by distinctive histiocytes that contain Michaelis-Gutman bodies. Malakoplakia predominantly affects the genitourinary tract including the bladder, the kidney, retroperitoneum, testis, and prostate.

Kidney
Renal involvement accounts for about 15% of the urinary tract cases. It occurs four times more frequently in women than in men. Renal malakoplakia is multifocal in 75% and bilateral in 50% of cases. Solitary renal malakoplakia presents as a sharply demarcated mass that may be confused with a renal tumor. The radiological findings of renal malakoplakia depend on the pattern of involvement. US may demonstrate solitary or multiple, ill-defined masses of varying echogenicity. CT demonstrates mildly enhanced, solitary or multiple renal masses. Extension of the inflammatory process into the retroperitoneum is sometimes observed on CT.

Prostate
A close relationship between malakoplakia and urinary tract infection with E. coli has been shown. Findings of prostatic malakoplakia usually simulate urinary tract obstruction or prostatitis, but it can be confused clinically with carcinoma. Malakoplakia may appear as a hypoechoic lesion on transrectal US, which is indistinguishable from prostate cancer.

Bladder
Malakoplakia usually occurs in the urinary tract, most often in the urinary bladder. It often present as a tumor-like mass of the bladder wall, which may be impossible to be differentiated radiographically from invasive bladder neoplasms.

Testis
Malakoplakia of the testis usually occurs in middle-aged men. In most cases only one testis is involved. The sonographic appearances are non-specific, with diffuse or focal areas of decreased echogenicity.

Treatment
The prognosis of urinary malakoplakia is related to both the site and extent of disease. Treatment may be medical or a combination of medical and surgical. Antibiotics that are intracellular bactericidal agents are preferred. Renal parenchymal malakoplakia carries a poorer prognosis, especially when the disease is multifocal or bilateral, when diffuse disease occurs in a renal transplant, or diffuse bilateral disease caused renal failure. If the patient does not respond to medical therapy alone, surgical removal of the plaques may be done. Clearly this disease, although not malignant, is not a benign process.

Conclusion
Although the imaging appearances of malakoplakia are non-specific and a malignant tumor is a common misdiagnosis, radiologists should suggest the possibility of malakoplakia, if clinical evidence of urinary tract infection is given.