

URETERAL OBSTRUCTION CAUSED BY SCHISTOSOMIASIS

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We report a unusual case of hydro-ureteronephrosis caused by schistosomiasis in a 66-year-old female. Computed tomography (CT) and biochemistry initially suggested a transitional cell carcinoma of the left proximal ureter. The patient was referred for reno-ureterectomy, but histopathological examination of the resection specimen demonstrated deposits of *Schistosoma haematobium* eggs. Although schistosomiasis is rare in Western Europe, this case illustrates the importance of considering infectious disease in patients with obstructive uropathy, particularly in the context of travelling or immigration from endemic areas.

Key-word: Schistosomiasis.

Schistosomiasis (Bilharziasis), a major health problem in developing parts of the world, is seen with increasing frequency in Western Europe, due to air travel and immigration from endemic areas. The urogenital variant, caused by *S. haematobium*, results in a generalized pelvic disease, mostly affecting the lower urogenital tract. On CT, key-imaging findings include diffuse wall thickening, hydro-ureteronephrosis and wall calcifications. These non-specific imaging features have a long list of differential diagnoses, thus biochemical and pathologic correlation is required. We describe a case of an uncommon appearance of urogenital schistosomiasis.

Case report

A 66-year-old woman presented to the department of urology with a one-day history of heavy and intermittent left flank pain. There had been no gross hematuria. She mentioned a holiday to Malawi several months ago. Medical history was negative for any significant illness nor smoking. Physical examination revealed a mild tenderness of the left flank. Laboratory tests showed a slight raise of C-reactive protein level at 2.5 mg/dL, a normal total white blood cell count (8.2×10^3 WBC/ μ L), but a subtle eosinophilia (5%). Urinalysis demonstrated 42 WBCs/ μ L, 20 RBCs/ μ L and multiple atypical urothelial cells suggestive for malignancy. Abdominal CT-scan revealed a mild dilatation of the left pyelum and proximal ureter, as well as focal wall thickening of the left proximal lumbar ureter, suggesting localized transitional cell carcinoma (Fig. 1). There

were no adenopathies nor distant metastases. Ureteroscopy failed to obtain abnormal tissue for diagnosis. Based on the results of urinalysis and imaging, the patient was referred for a complete left reno-ureterectomy. Histopathological examination of the resection specimen demonstrated deposits of *Schistosoma haematobium* eggs (Fig. 2). The patient was additionally treated with praziquan-
tel.

Discussion

Schistosomiasis (bilharziasis) affects more than 250 million people worldwide and is second only to malaria in parasitic disease morbidity, with 20 million people classified as having severe disease (1). Human schistosomiasis is caused by 10 species of flatworms, in which the vast majority of infections are caused by *Schistosoma mansoni*, *S. japonicum*, and *S. haematobium* (2). Urogenital schistosomiasis, caused by *Schistosoma haematobium*, is endemic in South and Central America, sub-Saharan Africa and the far East. However, this geographic distribution is significantly altering by increased air travel and immigration.

Human infection requires direct contact with freshwater, containing the intermediate host, an infected aquatic bulinid snail. The larvae emerging from the snails are able to penetrate the human skin, then migrate into the dermal veins and continue to the vesical and pelvic plexus veins, where the larvae mature, copulate and ultimately lay eggs (3). Some ova penetrate into the lumen of the bladder, but others become encapsulated in the tissues, causing

a granulomatous inflammation, similar to tuberculosis. Healing process encompasses dystrophic calcification of dead ova and mural fibrosis, forming polypoid lesions (4). Because of the blood supply anatomy, the urinary bladder, the pelvic part of the ureters and seminal vesicles are more frequently affected by the disease, than the other reproductive organs, the upper part of the ureters and the urethra (5).

Most individuals are asymptomatic or may present with symptoms years after having immigrated from or having visited endemic regions. Main presenting features are loin pain, dysuria, renal colic, fever and hematuria. The disease usually is self-limiting, but sometimes in case of frequent re-infestation and inadequate treatment schistosomiasis can result in urinary tract deformities, bladder malignancy and renal failure.

Imaging findings, blood tests (anaemia and eosinophilia), history and clinical suspicion may aid in the diagnosis of urinary tract schistosomiasis, but a definitive diagnosis is based on the combination of endoscopy, biopsy and laboratory studies, which include demonstration of eggs in the urine, (FAST)-ELISA and serum antigens.

Although ultrasonography, plain X-ray and conventional excretory urography were previously regarded as the main imaging method for diagnosis, MR- and CT-urography are currently the preferred imaging modalities in detecting urinary tract morbidity. Urinary tract abnormalities in *S. haematobium* can be divided in two phases. The active phase is characterised by calyceal and ureteral dilatation, filling defects and diffuse wall thickening. Ureterectasis can be observed without any distal stenosis, because in most cases it is secondary to peristaltic disorganization, caused by schistosomiasis (6). In the chronic phase, fibrotic deformations and wall calcifications may

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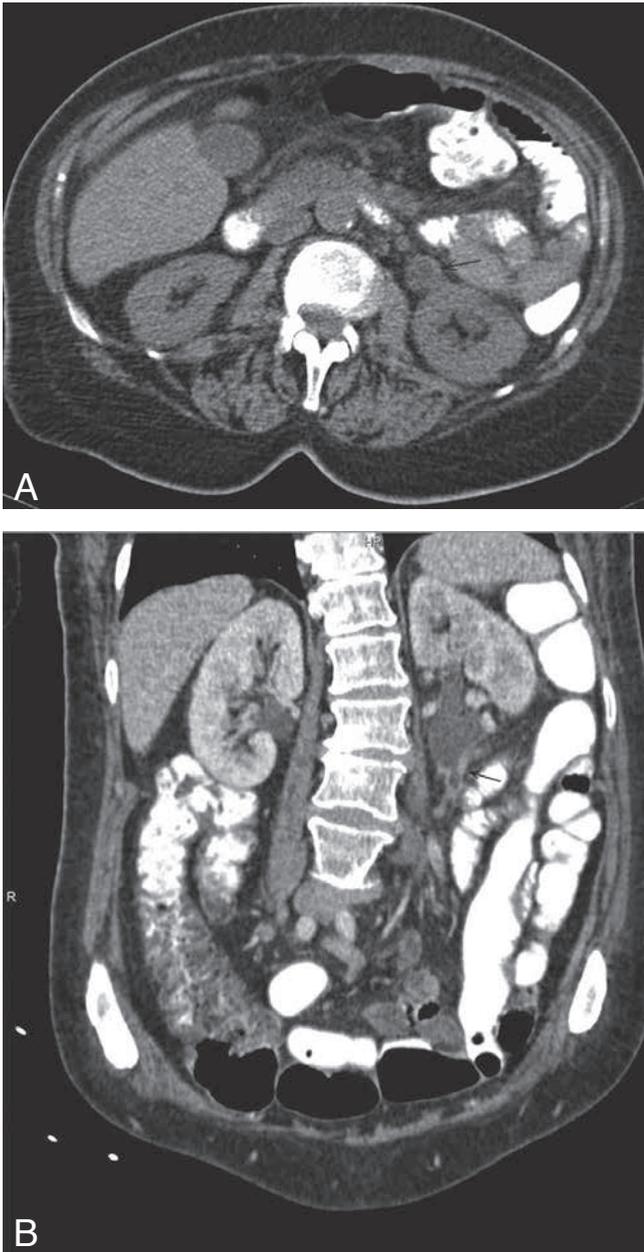


Fig. 1. — Axial non-enhanced (A) and contrast-enhanced sagittal and coronal reformatted images (B and C). Note the presence of ureteral wall thickening and subtle enhancement (black arrow) of the lumbar segment of the left ureter. Secondary retro-obstructive left pyelocaliectasis and ureterectasis is seen as well. Note that there is no invasion of the peri-ureteral fat and absence of enlarged retroperitoneal lymph nodes.

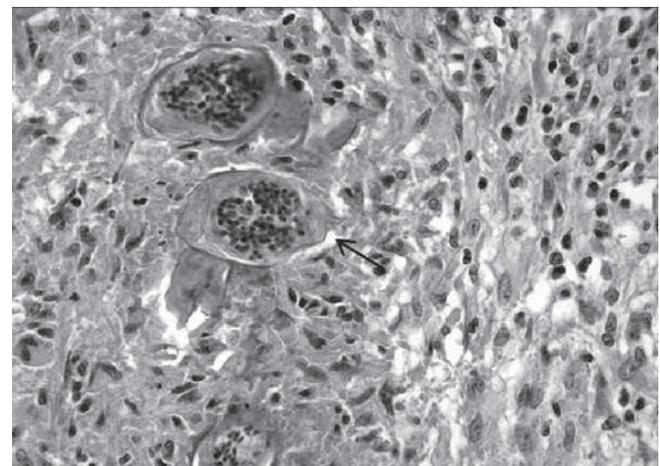


Fig. 2. — Photomicrograph (original magnification, $\times 100$; hematoxylin-eosin stain) of urinary tract tissue (lumbar ureter) of the resection specimen revealed *Schistosoma haematobium* ova (black arrow) surrounded by inflammatory cells.

be observed as relatively late sequelae. CT is the most sensitive modality for depicting these subtle submucosal or intramural linear to circular calcifications within the lower third of the ureters or bladder, representing an abundance of calcified ova.

Differential diagnostic a diffuse wall thickening may be caused by local radiation, exposure to chemotherapy, a variety of inflammatory or infective conditions (cystitis cystica, cystitis glandularis, malacoplakia, amyloidosis or eosinophilic cystitis) and neoplastic conditions. Calcification within the ureteral wall may also be seen in urothelial carcinoma and other neoplastic processes, tuberculosis and amyloidosis.

Current antibilharzial therapy, especially in active phases of the infection, relies on praziquantel, which incites the eggs to hatch and destroys the adult worms. Longitudinal studies have been found that bladder wall pathology and hydrone-

phrosis could regress upon this treatment (2). In chronic phases – however – endo-urological and open surgical interventions, including re-implantation of the ureter and nephroureterectomy, may be required.

Conclusion

As demographic features are changing, tropic diseases as schistosomiasis are increasingly seen in Western Europe. Therefore, radiologists should be familiar with the imaging appearances to avoid misdiagnosis and improper management. This infectious disease mostly affects the lower urinary tract and distal ureters, with imaging features including wall-thickening, hydro-ureteronephrosis and wall-calcification. Infrequently, as in our case, the upper urinary tract may be involved.

Cross-sectional imaging modalities, especially CT-urography, may play a pivotal role in evaluation, but final diagnosis is established by histopathological examination or demonstrating eggs in urine.

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