URETERAL OBSTRUCTION CAUSED BY SCHISTOSOMIASIS

Th. Vancauwenberghé, M. Oyaert, J.L. Termote, T. Mulkens, P. Bellinck

We report an 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 haematuria. 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 subtle eosinophilia (5%). Urinalysis demonstrated 42 WBCs/µL 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 praziquantel.

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. Ureterectomy can be observed without any distal stenosis, because in most cases it is secondary to peristaltic disorganisation, caused by schistosomiasis (6). In the chronic phase, fibrotic deformations and wall calcifications may

From: Department of 1. Radiology and Imaging, 2. Clinical Biology, H.H. Ziekenhuis, Lier, Belgium. Address for correspondence: Dr T. Vancauwenberghé, M.D., Dept of Radiology, HH Ziekenhuis, Mechelsestraat 24, B-2500 Lier, Belgium. E-mail: thomas.vancauwenberghé@student.kuleuven.be
be observed as relatively late sequel-
ae. CT is the most sensitive modality
for depicting these subtle submuco-
sal or intramural linear to circular
calculcations within the lower third
of the ureters or bladder, represent-
ing an abundance of calcified ova.

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

Current antibilharzial therapy, es-
pecially in active phases of the infec-
tion, relies on praziquantel, which
incites the eggs to hatch and de-
stroys the adult worms. Longitudinal
studies have been found that blad-
der 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 re-
quired.
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, hydroureteronephrosis 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.

References

POSTGRADUAAT RADIOLOGIE VAN DE VLAAMSE UNIVERSITEITEN
PROGRAMMA 2013-2014

26 september 2013 (20:00 – 22:30 uur) KUL
Thoraxradiologie
(audit. GA3, Onderwijs & Navorsing, UZ GHB)

17 oktober 2013 (20:00 – 22:30 uur) UA
Radioprotectie
(audit. G010 Jan Fabre, Campus Middelheim, UA)

21 november 2013 (20:00 – 22:30 uur) VUB
Cardiale beeldvorming
(auditorium Brouwer, Faculteit G & F)

12 december 2013 (20:00 – 22:30 uur) UG
Pelviene oncoloogie
(auditorium E, UZ Gent)

23 januari 2014 (20:00 – 22:30 uur) UA
Hybride beeldvorming
(audit. G010 Jan Fabre, Campus Middelheim, UA)

27 februari 2014 (20:00 – 22:30 uur) KUL
Mammografische beeldvorming
(audit. GA3, Onderwijs & Navorsing, UZ GHB)

3 april 2014 (20:00 – 22:30 uur) VUB
Interventionele radiologie
(auditorium Brouwer, Faculteit G & F)

15 mei 2014 (20:00 – 22:30 uur) UG
Reumatische aandoeningen
(auditorium E, UZ Gent)

Prof. Dr. P.M. Parizel – Universiteit Antwerpen
Prof. Dr. J. De Mey – Vrije Universiteit Brussel

Prof. Dr. K. Verstraete – Universiteit Gent
Prof. Dr. R. Oyen – Kath. Universiteit Leuven