Ureteric stricture secondary to unusual extension of prostatic adenocarcinoma

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This article describes an unusual finding in a patient who presented with an adenocarcinoma of the prostate and right hydronephrosis. A 68-year-old male presented with right hydronephrosis and a PSA of 96. DRE was consistent with cT3 carcinoma. Cystoscopy showed an exophytic superficial transitional cell carcinoma (TCC) of the bladder and a transrectal biopsy of the prostate confirmed adenocarcinoma Gleason score 4+3. Staging investigations (CT pelvis and bone scan) were negative; androgen deprivation therapy was therefore initiated for the prostatic adenocarcinoma. Upper tract imaging showed multiple filling defects in the proximal ureter. Ureteroscopy showed a stricture at the level of the iliac vessels. With a working diagnosis of upper tract TCC, right open nephroureterectomy was performed. Final histology showed prostatic adenocarcinoma infiltrating the adventitia of the entire ureter up to the level of the renal pelvis.

A rare cause of ureteric stricture, contiguous spread of prostatic adenocarcinoma, should be considered in the differential diagnosis of patients presenting with upper tract obstruction and a known history of prostatic adenocarcinoma. Androgen deprivation therapy for several months did not seem to cause resolution of the tumour in the periureteric, ureteric and perihilar tissues.

Key Words: prostatic neoplasms, prostate cancer, ureteral obstruction, ureteric stricture

Introduction

In patients with prostate cancer, the common causes of ureteric obstruction are extraluminal due to enlarged lymph nodes, or due to local extension of prostate cancer causing obstruction of the distal ureter. An unusual cause of ureteric obstruction in prostate cancer is the contiguous spread of prostatic adenocarcinoma along the entire length of the ureter to the renal pelvis; ten such cases have been reported in the literature.

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Case

A 68-year-old male presented with right upper quadrant pain. Physical examination showed an enlarged, hard prostate consistent with locally advanced prostate cancer (cT3). The patient's past history included temporal arteritis and a penicillin allergy. There was no history of tobacco use. His PSA was 96. An abdominal ultrasound showed right hydronephrosis.

At cystoscopy, a papillary tumor was noted on the posterior wall of the bladder. Resection and diathermy was performed. The ureteric orifices were unremarkable and the right retrograde pyelogram showed a normal caliber ureter until a tight stricture at the sacroiliac joint. There was proximal dilatation of the ureter. Flexible ureteroscopy was performed but the ureteroscope was unable to advance proximal to the stricture. The distal

ureter had a fibrous appearance. A ureteric stent was placed to facilitate repeat ureteroscopy. Ultrasound guided transperineal biopsy of the prostate was also performed at the same time. Histology of the bladder tumor showed low grade non invasive papillary urothelial carcinoma (WHO 2004); histology of the prostate showed Gleason 4 +3 adenocarcinoma of the prostate with tertiary pattern 5. Twelve out of 14 cores were involved with tumor (maximum 100% involvement of core). Treatment with cyproterone acetate 100 mg three times a day was commenced. A CT scan showed right hydronephrosis with a dilated ureter to the stricture, Figure 1, and no enlarged lymph nodes were noted. Bone scan was negative.

Follow up cystoscopy showed no recurrence of bladder urothelial carcinoma; the ureteric stent was removed and ureteroscopy was performed up to the stricture. The distal ureter was grossly edematous, and a tight irregular mid ureteric stricture of uncertain etiology was noted. The retrograde pyelogram showed an irregular ureter proximal to the stricture. Cytology from renal pelvis washings showed atypical tissue fragments. Urine cytology showed mildly atypical urothelial cells.

Intravenous and antegrade pyelogram revealed a very irregular ureter for a distance of 3 cm below the pelviureteric junction and a stippled effect below this which resembled ureteritis cystica, Figure 2.

Based on the following three facts, a working diagnosis of urothelial carcinoma of the upper urinary tract was made: 1) the patient was found to have urothelial carcinoma in the bladder earlier this year, 2) atypical cells were noted in the upper tract

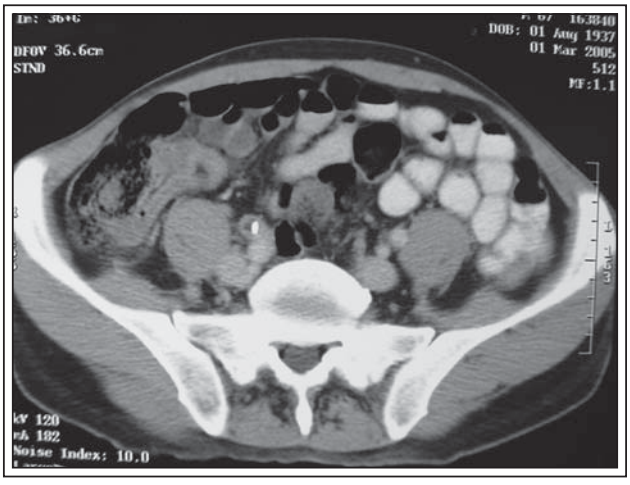

Figure 1. CT of the patient showing a ureter dilated despite a presence of the ureteric stent (white oval) with thickened wall of the ureter.

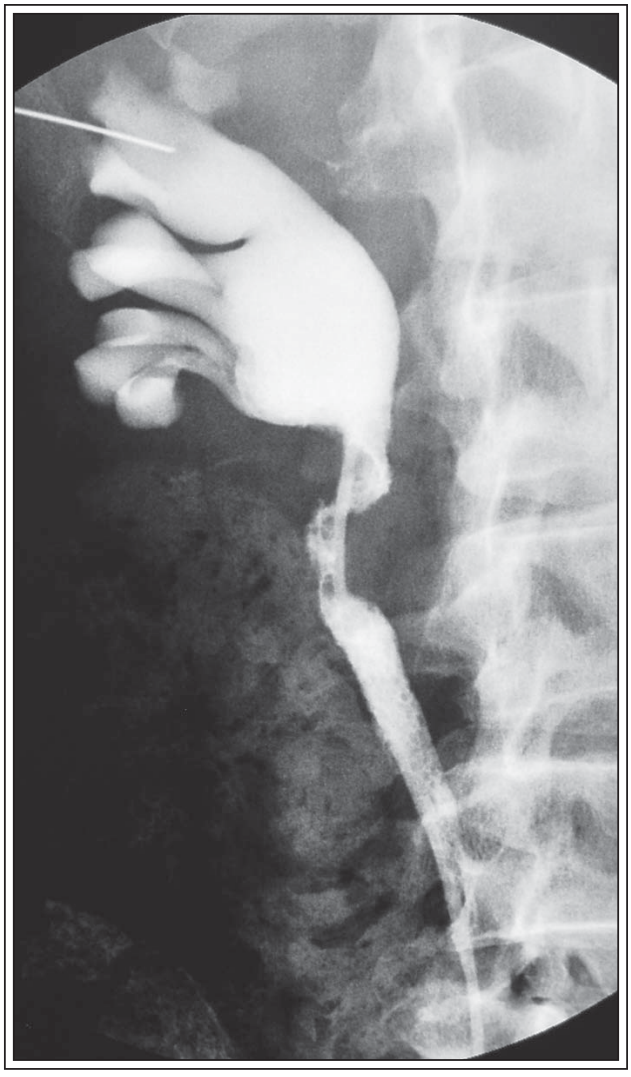

Figure 2. Antegrade pyelogram showing right hydronephrosis and dilated ureter with a ureteric stent and significant irregularities of the ureteric mucosa resembling ureteritis cystica or multiple urothelial carcinomas.

washings, and 3) multiple filling defects with strictures were noted in the ureter. Accordingly the patient proceeded to nephroureterectomy after negative staging investigations.

At operation the ureter was dilated and very thickened with marked periureteric inflammatory like changes. The patient made an uneventful postoperative recovery.

Histology showed adenocarcinoma of the prostate diffusely infiltrating along the entire length of the ureter within periureteric fibro adipose tissue, the adventitia of the ureter and in the muscular wall of the ureter from the distal resection margin to the pelviureteric junction,

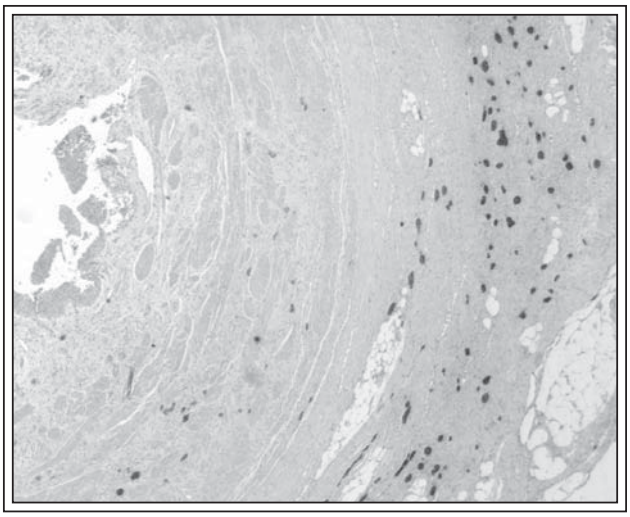

Figure 3. Histological finding from the transverse section of the ureter (x20) with staining for PSA showing glands of prostatic adenocarcinoma in the periureteric tissue and smooth muscle of the wall of the ureter (black spots).

Figure 3. Prostate adenocarcinoma was also present within the soft tissues at the hilum of the kidney. The Gleason score was 4+3 and adenocarcinoma was present at and transected by the distal ureteric margin and by the circumferential margin along the length of the ureter. The urothelium lining the ureter, renal pelvis and renal calyces showed no evidence of malignancy or carcinoma in situ. Sections of the kidney showed chronic pyelonephritis. Adenocarcinoma was not seen in the renal parenchyma. There was no urothelial carcinoma in-situ or evidence of papillary urothelial carcinoma.

Discussion

Contiguous spread of prostatic adenocarcinoma along the entire length of the ureter is a rare pattern of local invasion. Predisposing factors for such invasion are unknown.

Hydronephrosis may occur with adenocarcinoma of the prostate either due to local invasion of the intramural ureter or external compression by enlarged lymph nodes. Neither of those was present in the above mentioned patient and moreover staging investigations did not show distant spread despite a high initial PSA and a high volume of cancer found on biopsy. Hydronephrosis may result from obstruction by ureteric transitional cell carcinoma (TCC). In this case several hints were present suggesting possible upper tract TCC – hydronephrosis due to tight ureteric stricture, multiple filling defects, a previous history of bladder TCC, and atypical urine cytology. The differential diagnosis of multiple ureteric filling defects should include multifocal TCC, radiolucent calculi secondary to obstruction, blood clots, sloughed papillae, ureteritis cystica, fungus balls and malacoplakia. The differential diagnosis of the ureteric stricture (either benign or malignant) includes previous history of stone passage, chronic infections (especially tuberculosis), TCC or extrinsic obstruction. We performed a Medline search and we found only five cases of true contiguous spread of prostatic carcinoma along the entire length of the ureter.

Matsuo et al reported a case of prostate cancer with continuous invasion to the middle ureter in the Japanese literature.[1] Interestingly, the PSA was only 19.6 ng/mL. Another case was reported by Maeda et al in 1999, also in the Japanese literature.[2] In this case, the adenocarcinoma extended all the way to and involved the renal pelvis. The patient underwent a nephroureterectomy, and hence the diagnosis was established. Petit et al and Yonneau et al described cases of prostate cancer metastatic to the ureter in the French literature.[3,4] There was no contiguous spread however in these cases; rather they were true metastatic lesions. In the Spanish literature, Cortadellas et al reported a case in 1989 of prostatic adenocarcinoma metastatic to the ureter.[5]

In 1965 Kost et al reported a case of contiguous spread involving the distal ureter; the patient underwent a nephroureterectomy before the diagnosis was made.[6] In 1974 Schmidt described prostatic carcinoma extending to the renal pelvis.[7] A case of bilateral extension was noted by Bissada et al in 1975, following an exploratory laparotomy for bilateral hydronephrosis.[8] Macroscopically the ureters were found to be encased by indurated tissue. Biopsy of the tissue encasing the ureters as well as the ureter itself showed adenocarcinoma of the prostate. Zollinger et al reported a case of metastatic involvement of the right ureter; again in this case the spread was not contiguous, but rather was an isolated discrete lesion.[9] Similar cases were reported by Brotherus et al, Benejam et al, Haddad and Hulse et al, again purely metastatic lesions without contiguity to the primary.[10-13]

From the literature it is evident that this pattern of spread is rare and difficult to diagnose preoperatively. All patients underwent a nephroureterectomy in order to make the diagnosis. The role of androgen deprivation therapy (ADT) is also undefined in this group of patients; perhaps a longer period of ADT may have been sufficient treatment, therefore avoiding a nephroureterectomy.

Adenocarcinoma of the prostate contiguously involving the right ureter and renal hilum is an extremely rare entity, which is usually diagnosed on pathologic examination of the specimen. So far it is impossible to predict this type of pattern according to clinical and/or imaging investigations. A high level of clinical suspicion is warranted in all patients with locally advanced prostatic cancer, even in the absence of distant spread. Newer modalities of investigation such the Prostascint or PET scanning may help with this in the future; however these modalities currently have limited availabilities. Interestingly androgen deprivation therapy for several months did not seem to cause resolution of the tumor in the periureteric, ureteric and perihilar tissues. □

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