

Encrusted prostatic urethritis and cystitis

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Section: Uroradiology & genital male imaging

Area of Interest: Abdomen Genital / Reproductive system male Urinary Tract / Bladder

Procedure: Diagnostic procedure

Procedure: Contrast agent-intravenous

Procedure: Computer Applications-3D

Procedure: Computer Applications-Virtual imaging

Procedure: Comparative studies

Imaging Technique: CT

Special Focus: Calcifications / Calculi Infection

Inflammation Obstruction / Occlusion Case Type: Clinical Cases

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Patient: 72 years, male

Clinical History:

A 72-year-old man presented with strangury and sediment in urine 6 months after transurethral resection of the prostate (TURP) for benign prostatic hyperplasia. A suprapubic catheter was present before the TURP during 12 months. Urine analyses showed haematuria and leukocyturia with negative cultures. A prolonged urine culture isolated *Corynebacterium urealyticum*.

Imaging Findings:

Unenhanced and enhanced CT showed coarse linear and nodular calcifications in the enlarged prostatic urethra after TURP (Fig. 1 and 2). The calcifications were expanding in the bladder before the vesicoureteral junction with secondary bilateral hydroureteronephrosis (Fig. 3). The bladder wall was thickened with pronounced contrast enhancement (Fig. 2). There was no free fluid.

Control CT after 4 months of systemic and local therapy showed only a small less dense calcification in the lower part of the prostatic urethra (Fig. 4). There was no more hydroureteronephrosis.

Discussion:

Encrusted inflammation of the urinary tract is a chronic infectious disease of the urothelium by a urea-splitting bacterial infection, most frequently *Corynebacterium urealyticum*. The *C. urealyticum* has a strong urease activity causing hyperammonaemia and alkalinisation (pH>8) of the urine leading to crystallisation of struvite. [1] It has been described in the bladder, ureter and pyelum, but encrusted urethritis/prostatitis has only been reported two times. [2, 3] Risk factors are immunosuppression, prolonged antibiotic therapy, inflammatory or neoplastic lesions of the urothelium and/or (repetitive) urologic procedures. [4, 5]

Clinical presentation is non-specific, almost all patients present with haematuria and some have fever. Symptoms can vary from asymptomatic to cystitis, back pain and evacuation of calcified debris. Delayed diagnosis of the infection can give rise to acute obstruction and loss of renal function. [6] The diagnosis of *C. urealyticum* can be

missed on standard urine culture, it requires prolonged incubation on special media. [1] It is important to make the suggestion to the clinician when suspected on imaging.

Imaging is important to detect the calcifications. Radiographs can help but are not specific and some encrustation on the urinary tract can be radiolucent on radiographs. Ultrasound can show calcifications in the urothelium as hyperechogenic structures with acoustic shadowing, but the whole urinary tract is not accessible with abdominal ultrasound. Unenhanced CT is the most important imaging tool, intravenous contrast is not always necessary. CT visualises the urothelial wall with calcifications, these can be thin and regular or thick and irregular. [7] CT can show other signs of inflammation as wall thickening and surrounding soft tissue stranding.

Final diagnosis is made with the combination of history, specific urine culture and imaging features. Treatment focuses on eradication of the causing bacteria and dissolution of the encrustations by acidification of the urine and/or endoscopic removal. [4, 6] If the diagnosis is made on time the prognosis is good. So it is important to make the suggestion when urothelial calcifications are seen in patients who previously underwent urological procedures or on immunosuppression.

Differential Diagnosis List: Encrusted prostatic urethritis and cystitis, Schistosomiasis, Tuberculosis, Necrotic urothelial carcinoma, Malakoplakia, After intravesical instillations of cyclophosphamide or mitomycin

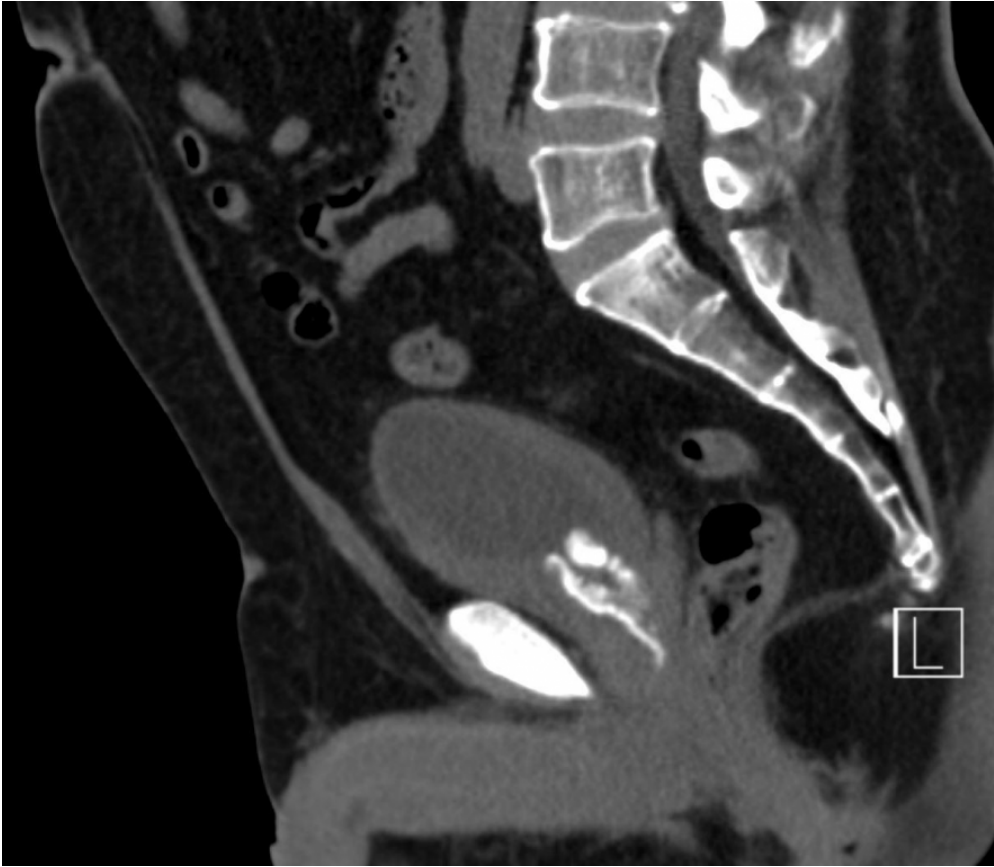
Final Diagnosis: Encrusted prostatic urethritis and cystitis

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Figure 1

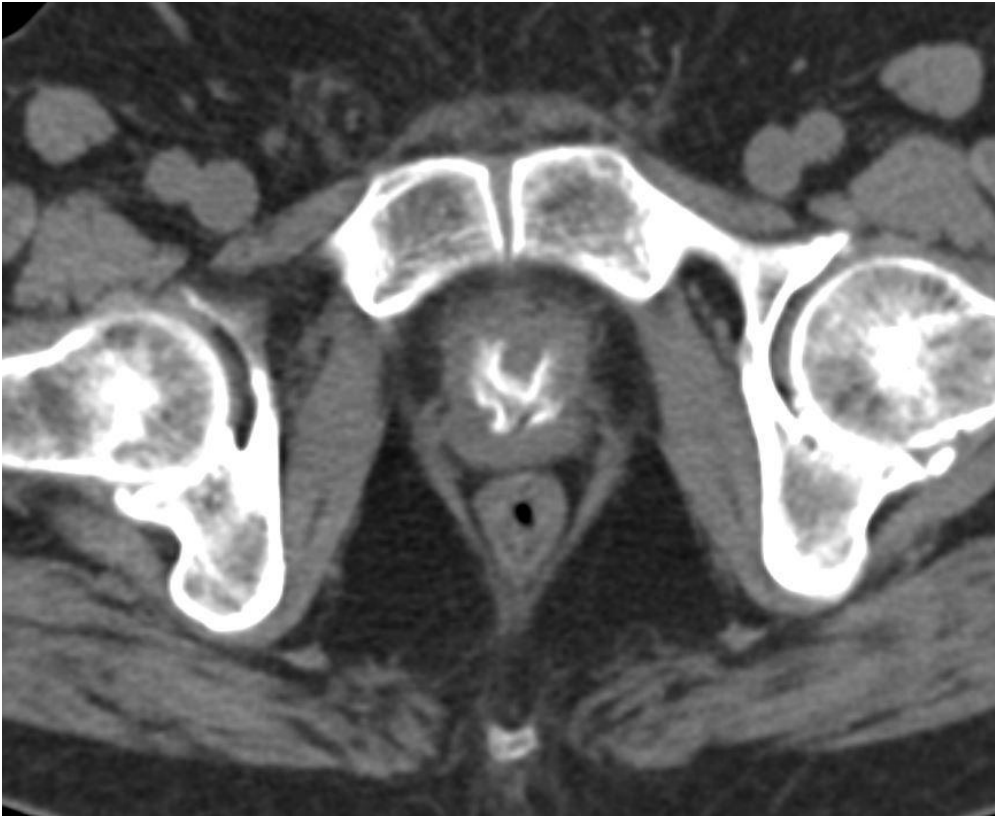
a



Description: Coarse linear and nodular calcifications in the enlarged prostatic urethra after TURP.

Origin: UZ Gent

b

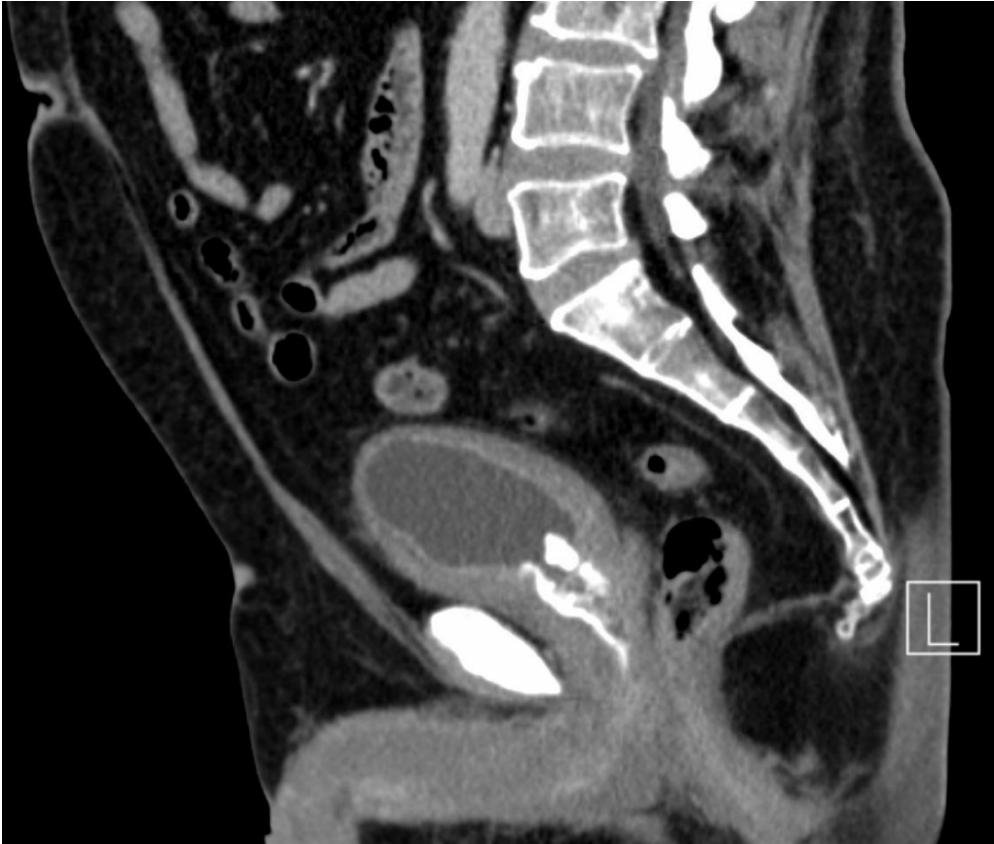


Description: Coarse linear and nodular calcifications in the enlarged prostatic urethra after TURP.

Origin: UZ Gent

Figure 2

a



Description: Thickened bladder wall with pronounced contrast enhancement.
Coarse linear and nodular calcifications in the enlarged prostatic urethra **Origin:** UZ Gent

Figure 3

a



Description: Coarse linear and nodular calcifications in the enlarged prostatic urethra expanding in the bladder before the vesicoureteral junction with secondary bilateral hydroureteronephrosis. **Origin:** UZ Gent

b



Description: Coarse linear and nodular calcifications in the enlarged prostatic urethra expanding in the bladder before the vesicoureteral junction with secondary bilateral hydroureteronephrosis. **Origin:** UZ Gent

c



Description: VRT of excretory phase showing bilateral hydronephrosis. **Origin:** UZ Gent

Figure 4

a



Description: Small less dense calcification in the lower part of the prostatic urethra. There was no more hydronephrosis **Origin:** UZ Gent