

## Septic Shock Revealing a Case of Encrusted Cystitis

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### Abstract

### Case Report

Alkaline-encrusted cystitis or pyelitis is a chronic severe urinary tract infection. Urothelium stone encrustation is the main characteristic of this infection. Imaging is useful for diagnosis and to guide and monitor effective treatment, we present a 75-year-old man presenting to the emergency department with sepsis following an encrusted pyelitis.

**Objective:** We aim to illustrate the radiologic characteristics of encrusted cystitis and pyelitis.

**Keywords:** Encrusted Pyelitis, Cystitis, Septic Shock.

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## INTRODUCTION

Alkaline-encrusted cystitis or pyelitis is a chronic severe urinary tract infection. Urothelium stone encrustation is the main characteristic of this infection and can be seen radiographically particularly on unenhanced CT. Imaging is useful for diagnosis and to determine and monitor effective treatment.

## OBSERVATION

A 75-year-old man was admitted to the ICU for sepsis of unknown etiology, he was tachycardic at 110 bpm and somnolent.

The patient's lab findings were perturbed with a high white blood count of  $18\,000\,10^3/uL$ , a c reactive protein of 230 mg/L, and altered kidney function, with

elevated urea of 1.5 g/L, and creatinine of 52 mg/L. Further questioning revealed a history of chronic dysuria, pollakiuria, and intermittent hematuria.

Renal ultrasound revealed thickened bladder with thin parietal hyperechoic calcifications (Figure 1).

Unenhanced abdominal Ct scan revealed enlarged kidneys as well as parietal calcifications of the pelvic wall, urinary tract, as well as a noticeably thickened bladder with a thin and superficial encrustation. Findings were in favor of encrusted pyelitis and cystitis.

Urine analysis was positive for CORYNEBACTERIUM UREALYTICUM, patient was effectively treated with oral acidification and antibiotics.



Figure 1: encrusted superficial bladder calcifications on ultrasound



**Figure 2: coronal abdominal unenhanced CT: enlarged kidneys with calcifications along bladder and urothelium lining**



**Figure 3: axial abdominal CT: pyelic enhancement in portal phase**

## DISCUSSION

Alkaline-encrusted cystitis is a severe chronic infection of the bladder, reported particularly in renal transplants as well as native kidneys, in immunocompromised or debilitated patients [1].

The germ in question is a urea-splitting micro-organism characterized by stone encrustation in the wall of the urinary tract. Although numerous bacteria have urease activity, *Corynebacterium urealyticum* is the most incriminated pathogen [2].

The major characteristic of this infection is its clinical context. Most patients have a previous history of urologic disease and have undergone urologic procedures. The delay between the urologic procedure and the diagnosis can vary up to several years.

Encrusted cystitis usually presents with dysuria and suprapubic pain, whereas encrusted pyelitis may be asymptomatic for a long period. Fever is inconstant. Macroscopic hematuria and an ammonia-like odor of urine are strongly indicative of this infection. Other symptoms include acute obstruction and acute kidney failure.

Imaging is a major part of diagnosis. Radiologic visualization of encrusted plaques is strongly indicative of this entity [3]. They can be depicted on an abdominal radiograph, or outlining the bladder wall on sonography or CT.

Bulky calcification in the upper urinary tract may be associated with free stones and could be mistaken for staghorn calculus.

CT appears to be the optimal technique to diagnose encrustation, particularly in the upper urinary tract. CT permits excellent visualization of the urothelial wall and of calcification superficially covering the urothelium; either thin and regular or thick and irregular. As well as urothelial wall thickening and, in severe infections, perinephric and periureteral changes with fat stranding.

### Differential Diagnosis Include:

schistosomiasis, tuberculosis, necrotic urothelial carcinoma, leucoplakia, or after intravesical instillations of cyclophosphamide or mitomycin.

## CONCLUSION

Medical history, clinical context, and urine analysis associated with radiologic findings are basic elements used in the diagnosis of encrusted cystitis or pyelitis. The diagnosis is confirmed by showing a urea-splitting micro-organism on urine culture.

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