CASE REPORT

Encrusted cystitis managed with multimodal therapy

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Encrusted cystitis is a rare chronic inflammatory condition of the bladder. The case of a male patient with dysuria and gross hematuria accompanied by the passage of stone fragments is presented. Multimodal therapy was undertaken. He was treated with Renacidin (citric acid mixture) irrigation as an inpatient. One month later, he underwent cystourethroscopy and was determined to have residual stone and fibrosis of the prostatic urethra. The patient was then treated with cystolitholapaxy and visual internal urethrotomy. This multimodal treatment resulted in resolution of his stone burden at follow-up.

Key Words: encrusted cystitis, bladder stones, inflammation

Case report

A 69-year-old Caucasian male was first seen with a history of bladder stones. His main complaints were dysuria and gross hematuria. Additionally, he experienced urinary frequency and nocturia, and had intermittent problems with bladder emptying and force of stream. The patient was taking tamsulosin for his obstructive voiding symptoms and pentosan polysulfate for his bladder discomfort. He is a former smoker.

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Physical examination showed a soft and non-tender abdomen without distension. He had no flank tenderness nor suprapubic pain. Post void residual by bladder scan was 65 cc. Urinalysis showed +3 microscopic blood, negative nitrites, and 500 leukocytes per microliter. A kidney, ureter, bladder (KUB) x-ray showed a round, calcified mass in the lower midline pelvis and a 3 mm to 4 mm radiopaque density overlying the upper pole of the right kidney, both of unknown origin, Figure 1. Computed tomography (CT) scan showed a large calcification in the anterior aspect of the bladder that measured approximately 2.5 cm in an anterior posterior (AP) x-ray and 3.4 cm in the transverse direction, Figure 2. Urine cultures were obtained and revealed multiple organisms with colony counts of less than 25000

colony-forming units per milliliter. No evidence of diphtheroid bacteria was present.

The patient underwent cystourethroscopy and transurethral resection of the lesion. Findings included a diffusely edematous bladder with a large calcified mass in the anterior wall, dome, and posterior wall of the bladder. Biopsy of the lesion showed inflammation, necrosis, and lymphoid aggregate, as well as calcifications suggestive of encrusted cystitis. The biopsy was negative for malignancy. Stone analysis showed the calcifications to be 50% magnesium ammonium phosphate, 30% ammonium hydrogen urate, and 20% hydroxy/carbonate apatite. The patient then underwent cystourethroscopy with laser cystolitholapaxy. The stone was fragmented with the holmium laser fragments and manually evacuated from the bladder. The patient then underwent 5 days of irrigation with Renacidin. The follow-up cystoscopy at 3 and 6 months disclosed resolution of encrustation cystitis.

Figure 1. Large calcification seen within the midline lower pelvis measuring at least 5.3 cm x 3.2 cm, and small, rounded radiopaque density, to the right of the L1 transverse process that appears to be overlying the medial aspect of the upper pole right renal shadow measuring 3 mm to 4 mm.

Figure 2. Large, eccentrically shaped calcification within the anterior aspect of the bladder measuring approximately 2.5 cm in anterior/posterior (A/P) by 3.4 cm in transverse dimension.

Discussion

Encrusted cystitis is a rare chronic inflammatory disease of the bladder. Urinary tract infections by urea splitting microorganisms may lead to ulceration of the bladder mucosa. The ulcer may then become encrusted with magnesium ammonium phosphate salts.[1] Encrusting of the actual bladder tissue makes encrusted cystitis a separate entity than bladder calculi.[2]

Various microorganisms may be involved in the inflammatory state that leads to encrusted cystitis.[3] One such urolithic pathogen is Corynebacterium urealyticum group D2.[4] As this bacteria has the ability to adhere to uroepithelial cells, it is often associated with urinary tract infections. Generally, C. urealyticum colonizes the skin of hospitalized patients or immunocompromised populations. This diphtheroid bacillus facilitates the deposition of crystals on the bladder mucosa. Also, this bacterium is resistant to antibiotic therapy such as B-lactams, aminoglycosides, and trimethoprim/sulfamethoxazole.[4]

Soriano and associates reported four cases of encrusted cystitis in which they isolated C. urealyticum.[3] All four patients experienced dysuria, frequency, urgency, and hematuria. These patients experienced improvement after antibiotic therapy and bladder irrigation with citric acid. Rarely, C. urealyticum may cause a fatal septic shock in an immunocompetent person.[5] Chung et al reported a separate mortality due to gross encrustations of the

entire upper urinary tract and bladder.[6] More commonly, patients will complain of irritative voiding symptoms and recurrent urinary tract infections.

This patient experienced similar symptoms to those described in the Soriano et al report. Unlike the Pierciaccante and colleagues' study, this patient did not have suprapubic pain.[1] He was not immunocompromised and had no history of an indwelling Foley catheter. These two factors, if positive, would increase the likelihood of infection with C. urealyticum and, thus, development of an encrusting cystitis or pyelitis.[4]

The authors were not successful with antibiotic therapy that consisted of trimethoprim/sulfamethoxazole alone, which led to the possibility that the patient was infected with a diphtheroid urea splitting pathogen such as C. urealyticum. In retrospect, the authors could have attempted management with vancomycin.[4]

In this patient, urine cultures showed multiple organisms with colony counts of less than 25000 colony-forming units per millil iter. No evidence of diphtheroid bacteria was present. Often, diphtheroid bacilli will not grow in standard urine culture. If C. urealyticum is suspected, the laboratory should be notified for further investigation.[4]

Antibiotic therapy is only part of a treatment plan. Struvite stones, such as the one the authors encountered are rarely resolved by medical management alone.[7] Effective management necessitates surgical removal of the encrustations as a component of treatment. As a third component, a substance such as Renacidin may be used to treat the existing encrustation by exchanging magnesium in the irrigant for calcium in the matrix, thereby increasing the stone's solubility.[8] Similar to the study of Soriano et al, the authors used this method of citric acid irrigation to dissolve the calcifications.[3] During the 5 day irrigation with Renacidin, a daily magnesium level was checked to guard against hypermagnesemia.

Conclusion

In the authors' experience, if an encrusted cystitis is suspected, prompt treatment is suggested. The process begins with an accurate isolation of the organism responsible for formation of the stone, although this may not be possible. Cystourethroscopy with biopsy of the lesion may provide a sample. A fastidious urolithic pathogen, such as C. urealyticum, should be suspected and the laboratory made aware that the clinician is considering this microorganism as a causative agent.

After accurate identification is made, the treatment is three-fold. First, an appropriate antibiotic regimen must be chosen to treat infection when present. Second, the nidus of infection should be removed surgically. Third, Renacidin may be considered to treat encrustation by increasing the stone's solubility. The fourth, acidification of the urine by bladder irrigation may eliminate an existing stone and prevent formation of new encrustations.

The time frame for these treatments may be variable, depending on the amount of encrusted tissue and patient's health. However, in any case of encrusted cystitis, rapid identification and multi-factorial treatment is associated with an improved patient outcome.

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