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Soft Rock – When Blasting It Doesn’t Work

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**Case**

**History of Present Illness:**
- 68-year-old female with several days of malodorous urine and fevers.
- Daughter knew it was a urinary tract infection (UTI) due to the distinct urine odor.
- No hematuria, dysuria, retention, or incontinence

**Recent Medical History:**
- Recent hospitalization for UTI with culture that grew P.mirabilis. Tx with course of cefdinir.
- Follow-up culture ordered by PCP grew extended-spectrum beta lactamase (ESBL) E.coli.

**Physical Exam and Vital Signs:**
- Vital signs: 115/48, 101, 38 C, 18, 93% RA.
- Lumbar spine tenderness, no CVA tenderness.
- Large area of erythema of right inner thigh and chronic lower extremity edema. Otherwise a non-focal exam.

**Labs and Imaging:**
- Procalcitonin 2.3, UA - packed bacteria/WBCs/3+ leukocyte esterase, WBC - 17.5, and urine culture with >100,000 CFU/mL ESBL E.coli.
- CT abdomen: Staghorn calculus within the lower pole calyces and renal pelvis of the right kidney. Heterogenous low density material within the mid and upper pole calyces suspicious for xanthogranulomatous deposits.
- Renal function evaluated via nuclear medicine kidney flow and function with diuretic showing: No urinary obstruction. Asymmetrical renal activity with 73% left kidney and 27% right kidney.

**Clinical Course:**
- IV antibiotics while undergoing work-up.
- Urology consulted and recommended removal of stone due to recurrent UTIs with same organism despite treatment.
- Taken to the operating room for removal of right staghorn calculus. Procedure abandoned due to unexpected finding of “white exudate renal collecting system mass” with concern for an organized abscess or fungal ball.
- Tissue sample sent for culture and pathology. Culture grew Proteus mirabilis/penneri. Pathology report stated degenerative amorphous material with rare inflammatory exudate and fibrinoid hemorrhagic exudate. Similar gross appearance to picture at right.
- Underwent second procedure to remove via percutaneous nephrolithotomy.
- Removed successfully by manual grasping and removing in pieces.

**Appearance on Non-Contrast CT Abdomen (Case Patient)**

**Macroscopic Appearance**

Soft calculi extracted by renal pelvis lithotomy. Similar to the material extracted from the case patient.


**Renal Matrix (Proteinaceous) Stones**

**Rare:**
- First described in 1908
- 50 published cases between 1908-1981

**Risk Factors:**
- Female.
- History of urinary tract infections, especially P.mirabilis or E.coli.
- Chronic renal failure/hemodialysis.
- Proteinuria.

**Presentation:**
- Similar to those with calcium nephrolithiasis – flank pain and UTI.

**Diagnosis:**
- Possible to suspect/diagnose based on imaging.
- Usually made at the time of surgery.

**Treatment**

**Surgery:**
- Surgical removal is necessary – emergently if causing obstruction or urgently for source control when associated with a UTI.
- Percutaneous or uroscopic approach.

**Prevention of recurrence:**
- Prophylactic antibiotic use.
- Acidification of the urine.

**Conclusions**

- Rare and easily overlooked or mistaken for calcium based renal calculi, diagnosis is often at the time of surgery.
- Can cause obstruction and renal failure.
- Surgical/urologic intervention is needed for removal. Refractory to shockwave lithotripsy.
- Antibiotics and/or acidification of the urine may help prevent recurrence.

**References**