

Milky urine and struvite crystals

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Figure 1 | Milky aspect of the urine.



Figure 2 | Optic microscopy study depicting the struvite crystals.

A 66-year-old man was referred to the nephrologist because of recurrent episodes of afebrile low back pain, voiding-associated pain, and milky urine. Past history was positive for urolithiasis due to calcium oxalate stones, managed with hydrochlorothiazide 12.5 mg/day for the last 3 years. Chemistries revealed normal renal function and a urinalysis as described: density 1010; pH 7.5; proteinuria 0.6 g/l; leukocytes 20–30 per high-power field; pyocytes 10 per high-power field; abundant struvite crystals. Figure 1 depicts the milky aspect of the urine. In Figure 2 the optic microscopy study displaying the struvite crystals is shown. Renal sonogram, abdominal computerized tomography scan, and urological functional studies were normal. A urinary culture was positive for *Pseudomonas aeruginosa* and successfully treated with ceftazidime for 14 days according to the anti-biogram report. The patient

has been symptomless for the past 4 months. Struvite stones represent 10–15% of urolithiasis. However, in our report the struvite burden was clinically manifested by crystals and a milky urine. Struvite is the common name given to the chemical ammonium magnesium phosphate hexahydrate, $\text{NH}_4\text{MgPO}_4 \cdot (6\text{H}_2\text{O})$, manifested as urinary crystals and avidly prone to agglutination forming stones, unusually and unexpectedly absent in our case. Thereafter, urease-positive bacteria are capable of converting waste urea into excess ammonia, which in turn alkalinizes the urine. Struvite is normally soluble in an acid or neutral environment, but it is insoluble in an alkaline medium, crystallizing out of the urine. These crystals may block the urethra and should trigger the search for stones. This case was atypical given the presence of marked and symptomatic crystalluria but no true stones.