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The modern era struvite stone: patterns of urinary infection and colonization
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Introduction and Objectives: We sought to offer a modern assessment of struvite stone formation by examining both the characteristics of struvite formers and the nature of associated infectious organisms.

Methods: We retrospectively identified patients who underwent PCNL between February 2009 and August 2013. Predisposing characteristics and clinical history of UTI were assessed. Urine cultures (pre-operative free catch and intra-operative renal pelvic) and stone cultures were reviewed for evidence of infection.

Results: Struvite formers represented 38 (8%) of 474 patients. 83% of struvite formers were female (vs 46% in non-struvite formers, P<0.001). 94% of struvite formers had a history of recurrent/recent UTI and 60% exhibited a UTI risk factor. A greater percentage of struvite formers demonstrated growth on pre-operative urine (45% vs 22%, P=0.003) and stone cultures (69% vs 23%, P<0.001) compared to non-struvite formers. Stone cultures were positive for urea-splitting organisms in 29% of struvite formers (vs. 10% non-struvite formers, P=0.001). 31% of struvite stones were sterile and 49% grew non-urea-splitting organisms, including E. coli and Enterococcus spp.

Conclusions: While demographic data, clinical history and culture results suggest a significant predisposition to infection among struvite formers, urea-splitting organisms could not be identified in association with all struvite stones in this series. The additional finding of sterile struvite stones prompts consideration of antibiotic mediated sterilization and lends support to pre-operative antibiotic use. The presence of traditionally non-urea-splitting organisms encourages re-evaluation of their urea-splitting potential and reveals the importance of expanded antibiotic coverage for both Enterococcus spp. and E. coli in managing suspected struvite stones.