



## Urolithiasis: newer trends and practice

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Urolithiasis is a universal problem that has become increasingly prevalent globally and has a high rate of recurrence. In recent years, the epidemiology of stone patterns has undergone significant change worldwide. Most of the stones seen in developed countries are small and soft, whereas in developing countries there is significant prevalence of staghorn calculus. Managing these stones has recently undergone geo-regional changes. Decreasing utility of extracorporeal shock wave lithotripsy (ESWL), whereas flexible ureteroscopy is becoming more prevalent in developed countries. At the same time, even distribution of applications like ESWL, percutaneous nephrolithotomy (PCNL), ureteroscopy is seen in developing countries.

With the increase in the incidence, there has been an ever-increasing rate of managing urolithiasis. In a short span of 2–3 years, changes have occurred in these areas that are nothing short of a revolution. Initially, there was a technical development phase wherein the stress and sphere of development was instrumentation. Now, with the advances already set in the instrumentation field, further scope of development rest in the areas relating to minimizing tissue trauma and preventing recurrences. Imaging of urolithiasis has evolved over the years due to technological advances and a better understanding of the disease process. Computed tomography (CT) has been the investigation of choice for the evaluation of urinary stone disease. The emergence of multidetector CT and the recent introduction of dual-energy CT have further reinforced the superiority of this modality over other imaging techniques in the management of urolithiasis. CT urography is not limited to simply helping make an accurate diagnosis in patients with stone disease; it is also useful in the assessment of stone burden distribution, composition, and fragility, findings that are helpful in determining appropriate treatment strategies. CT urography assessed that staghorn morphometry is a new concept that can enable us to clinically classify staghorns. This would be appropriate in better understanding the complexity of the stone and would enable us to better counsel the patient. Familiarity with recent technological developments will help radiologists

meet the growing expectations of urologists in this setting. In addition, radiologists should be aware of the radiation risks inherent in the imaging of patients with urolithiasis and take appropriate measures to minimize this risk and optimize image quality.

Much of the technological advancement has resulted in further miniaturization consequently minimizing tissue trauma. Fundamental advances in optics, illumination, television application, instrumentation, and operative radiology has culminated in the advanced state of the technology, as it is known today. The interest in reducing the tract was to potentially reduce the invasiveness of the procedure, therefore reducing complications. Mini-perc represents an alternative to ESWL and retrograde intrarenal surgery for small bulk renal calculi. It represents an extension of the indication for conventional PCNL that it can in no way replace. Miniaturization of instruments in 'PCNL' has also spawned an interest in so-called 'Microperc', in which the procedure is carried out through 16-gauge needle.

Flexible ureteroscopes have allowed us to treat renal stones endoscopically through natural orifices. Unfortunately, there continues to be the problem of remnant stone fragments that continue to pose a health problem to patients with the risk of recurrent symptoms, obstruction and infection. A novel technique of stone fragment extraction using microparticles and magnets has the potential to improve the stone-free rates of surgery. Further research needs to be carried out before it is ready for human use. Regulation of fluid and dietary intake habits is essential in comprehensive preventive management of urolithiasis. However, despite a large body of epidemiological database, there is a dearth of good quality prospective interventional

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studies in this regard. We selected a review describing the association between nephrolithiasis, vascular disease, and metabolic syndrome. There is increasing evidence that kidney stone formation is associated with a number of systemic problems including cardiovascular disease, metabolic syndrome, and its components. Urologists need to be cognizant of these associations as they may be able to contribute to an early diagnosis of a significant

medical problem, or provide counseling to patients to prevent their occurrence.

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