

MANAGEMENT OF URINARY STONES- CURRENT PERSPECTIVES

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Abstract : Percutaneous Nephrolithotomy (PCNL) was established as a minimal invasive treatment option for removal of kidney stones in the seventies and was further developed in the following years. However, PCNL-frequency diminished with the introduction of extracorporeal shock wave lithotripsy (ESWL) in the early eighties. In recent years, as clinical experience with ESWL revealed its limitations, the role of PCNL for treating urolithiasis was redefined. Today, PCNL should be the first line treatment of large or multiple kidney stones, and stones in the inferior calyx. Furthermore, improvements in instruments (i.e. ureteroscopes) as well as lithotripsy technology (i.e. ultrasound / pneumatic devices, Holmium-YAG-Laser) increased the efficacy of percutaneous stone disintegration yielding stone free rates of >90%.

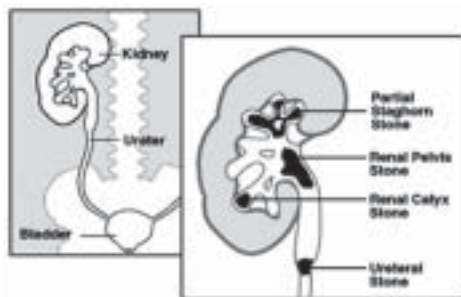
PERCUTANEOUS NEPHROLITHOTOMY (PCNL)

Since Fernstrom and Johansson first removed a renal calculus through a nephrostomy tract in 1976¹, percutaneous nephrolithotomy (PNL) has significantly changed and is continuing to evolve. Certain indications for percutaneous management of renal calculi have been established; then depend on the size and the composition of the stone, the site of the stone

PNL INDICATIONS AND LIMITATIONS

Size of the stone:

PNL as monotherapy has advantages in the removal of large stones, achieving excellent results with minimal morbidity. The point of transition for the term "large stone" is believed to be 2cm. Partial or complete staghorn calculi may require multiple punctures or the combination of PNL and SWL followed by repeat PNL (sandwich therapy). PNL should be the preferred technique for patients with struvite stones. When these infected stones are removed completely by PNL, the patient has a 90% chance of remaining stone free for at least 3 years. Compared to SWL or open surgery, PNL, alone or in combination with SWL, results in higher stone free rates, less number of procedures needed per patient, lower morbidity, shorter operative time, shorter hospital stay and earlier return to work. Treatment of lower pole calyceal stones should be guided by the diameter of the stone. In a metaanalysis, limitations of SWL included lower stone free and higher retreatment rates, compared to PNL². Large stones of the lower pole are best managed by PNL as a first treatment option, irrespective of the anatomy of the lower pole.



However, PNL has a higher success rate at the cost of higher complication rates. As an alternative, flexible ureteroscopy and laser disintegration have been proposed for lower pole stones upto 2 cm. Despite recent technological advances, such as the use of ureteral access sheaths, which in theory increases irrigant flow and improves visualization, the success rate does not exceed 88%. These rates necessitated two sessions on several occasions.

Calyceal diverticula :

Although no prospective randomized trials comparing PNL, laparoscopy and ureteroscopy exists, percutaneous nephrolithotomy is considered the gold standard for managing calyceal diverticula³. High rates of stone clearance and diverticular obliteration have been published in contemporary series, while complications ranged from 0 to 30 %. When compared to SWL, PNL achieved a higher stone free rate with similar recurrence rates and complication rates. Ureteroscopic management yielded poor results with regard to stone free (19 to 58 %), symptom free and diverticular obliteration status (20 %). Ureteroscopy should be reserved for patients with anterior, mid or upper pole diverticula or for patients who are unable to undergo PNL. The laparoscopic approach, although applied in few patients, seems appropriate for those with thin overlying renal parenchyma or with anterior lesions that are too large or not accessible to ureteroscopy.

