

few complications. Occasionally, a repeat URS may be required, especially with large stones to ensure complete clearance of all fragments.

#### Can it be extended to treat kidney stones?

Flexible Ureteroscopy (Also known as RIRS – Retrograde Intrarenal Surgery) is a recent advancement, where even the interiors of the kidney can be reached. The stones can then be fragmented using laser. This technique is applicable only for smaller kidney stones. Larger stones require either ESWL or PCNL.

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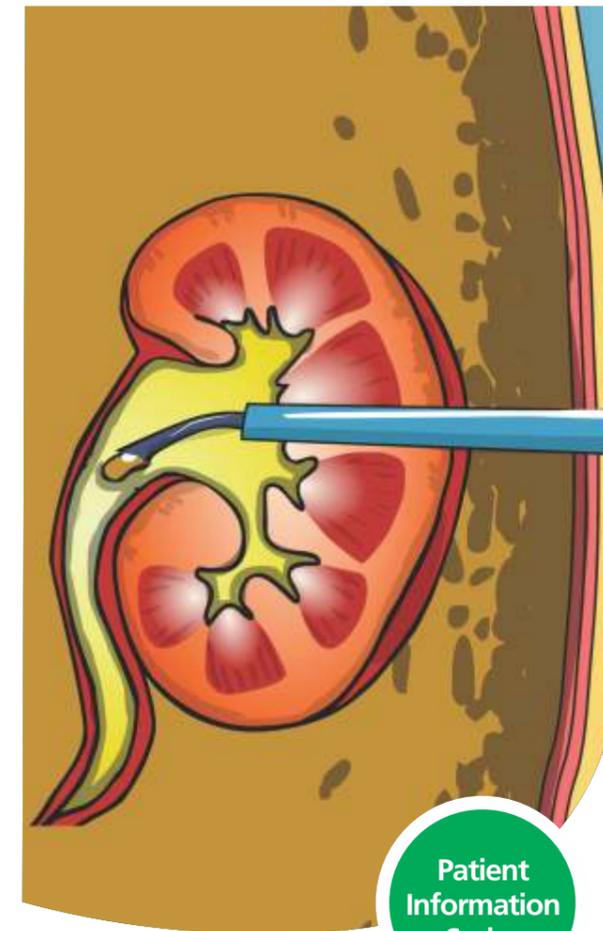
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## Urology - Stone



Patient  
Information  
Series

PCNL (Percutaneous Nephrolithotomy) &  
URS (Ureteroscopy)

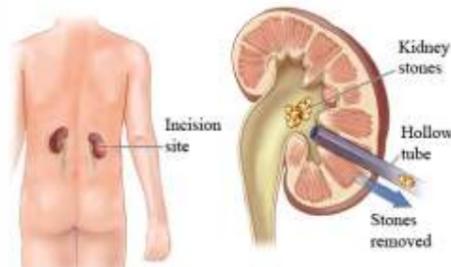
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## PCNL (Percutaneous Nephrolithotomy)

### What is PCNL?

PCNL is a surgical Procedure for removing larger stones from the kidney or the upper ureter.



### How is the procedure done?

A small hole (~ 1 cm) is made through the flank, into the kidney to reach the stone. The stone is reached using an endoscope designed for this procedure, called Nephroscope, broken into pieces by a lithotripter and removed. A tube (known as Nephrostomy tube or PCN ) may be kept in the kidney in some cases, after the procedure, which is brought out through the same hole. In most cases, a stent (a long, slender tube with 2 coiled ends), which occupies the whole ureter with one coiled end in the kidney and the other end in the urinary bladder, is inserted for drainage of urine.

### What are the advantages of this Procedure?

Even large stones can be removed with a small incision. Previously, major surgeries involving big incisions and opening of the kidneys were required for these stones.

Moreover, the hospital stay is only 3-4 days. Kidney or upper ureteric stones which cannot be treated

by ESWL (Shock wave Lithotripsy) or Ureteroscopy can be removed by this technique. The stone clearance is usually 90-95%, better than any other technique.

### Are there any disadvantages?

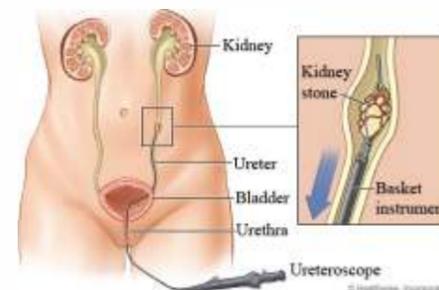
General Anesthesia is required, so hospitalization for 2-3 days is necessary.

### What are the complications?

Bleeding is the most common complication. Some blood tinged urine is common after the procedure, but bleeding requiring blood transfusion is rare. Rarely (less than 1 in 1000 cases), bleeding can be torrential, requiring a procedure called angio-embolisation.

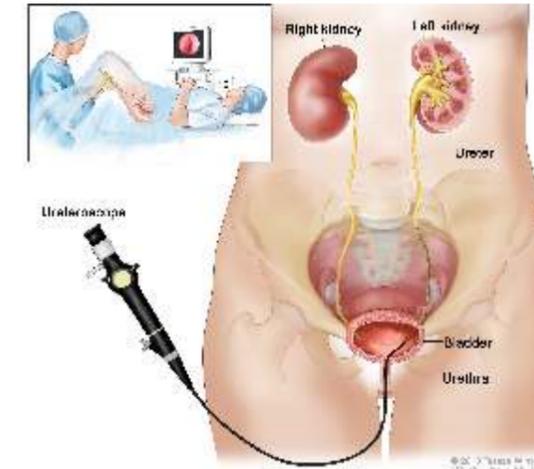
This bleeding is caused by a pseudoaneurysm (an abnormal blood vessel that develops following the procedure). Occasionally, some urine leak may occur from the flank wound, which usually subsides after a few days.

## URS (Ureteroscopy)



### What is this procedure?

This is an endoscopic procedure which involves the use of a special endoscopic instrument called



Ureteroscope to remove stones in the Ureter. It is a thin, long, instrument which is introduced through the urethra and bladder into the ureter. Various maneuvers (grasping the stone, basketing, laser fragmentation) can be done to remove or crush the stones depending on their size and location. Can this procedure be done for all ureteric stones? Most stones in the lower and mid ureter and some stones in the upper ureter can be treated by URS. Some upper ureteric stones will not be accessible to the instrument (especially those very close to the kidney). In these cases, any of the other treatment options like Stenting + ESWL, PCNL or RIRS may be required.

### What are the advantages and disadvantages of this procedure?

The advantages are that it can be done as a day care procedure as no incision is required. Even large stones in the mid-lower ureter can be cleared by URS, avoiding the need for open surgery. Apart from occasional technical difficulty in reaching the stone in some cases, it is a safe procedure with very