The Oxford Stone Group
Department of Urology
Oxford University Hospitals NHS Trust
Churchill Hospital
Oxford OX3 7LJ
01865 741841

PCNL - Percutaneous Nephrolithotomy

Please attach patient sticker

The Procedure

This is a telescopic procedure to remove stones from the kidney. It involves the formation of a 'track' between the surface of the skin and the kidney, down which a telescope is placed, and through this the stone is broken into smaller pieces which can be removed through the telescope. It should be regarded as a major operation through a small incision. The majority of patients make an uncomplicated recovery following PCNL, but some experience complications as listed below. This form also lists things you should expect following the operation and it discusses alternative treatment options for kidney stones.

Alternative treatment options for kidney stones

Kidney stones may be treated by shock wave lithotripsy (ESWL – the focusing of externally generated shock waves onto the stone); flexible ureteroscopy and laser treatment, PCNL and open surgery. In general terms, the type of treatment depends on the size of the stone, its location, whether you have one or two kidneys and other factors such as your general health.

In general terms, ESWL and flexible ureteroscopy/laser treatment are less efficient and less effective in removing large stones when compared with PCNL and open surgery. However, ESWL and flexible ureteroscopy/laser treatment are, generally speaking, associated with a lower risk of serious complications and for this reason some patients decide to have ESWL in preference to PCNL. Some stones types (eg. staghorn stones) are simply not suitable for treatment by ESWL or flexible ureteroscopy/laser treatment, and are best treated by PCNL (or open surgery).

Please attach patient sticker

Percutaneous nephrolithotomy (PCNL)

- A general anaesthetic is almost always required.
- While the majority of patients following PCNL make an uncomplicated recovery, serious problems do sometimes occur. We have had one death following PCNL as a consequence of a stroke. In two patients severe bleeding has occurred, leading to loss of a kidney in one and a period in the ITU (Intensive therapy unit) in both. The likelihood of serious complications is greater in older patients and those with other medical problems eg. heart disease, lung disease, spinal cord injuries.
- Occasionally it is not possible to form a 'track' into the kidney and PCNL is therefore not possible. In this situation, an open operation may be necessary, at a later date under another general anaesthetic. Over the last 6 years we have been unable to form a 'track' in 2 patients, and have had to proceed with open removal of the stone at a later date.
- Severe bleeding requiring a blood transfusion, blockage of the bleeding artery by injection of special metal coils directly into the artery ('embolisation'), or even emergency removal of the kidney can be required. Over the last 6 years we have had to perform embolisation in 2 patients following PCNL and, as stated above, in another patient we have had to remove the kidney as an emergency. As stated above, 2 of these 3 patients were very unwell after their operation and spent several days on the intensive therapy unit (ITU). In several more patients we have performed angiography because we suspected serious bleeding, but fortunately no such bleeding was found.
- Damage to the spleen is uncommon, but if it occurs, splenectomy (removal of the spleen by an emergency open operation through a large incision) is often required, which exposes the patient to a life-long increased risk of serious, potentially life-threatening infections.
- The large intestine is close to the kidney. Damage to the bowel is uncommon, but it can occur. This leads to a leak of bowel contents because of a communication between the bowel and the skin (known as an enterocutaneous fistula). It usually requires a few weeks (occasionally months) of treatment with percutaneous drains (a tube inserted through the skin into the kidney) until the communication between the bowel and the skin has healed. Rarely, open surgical repair at a later date will be required. Over the last 6 years we have had one patient who developed an enterocutaneous fistula after PCNL. This required the patient to wear a small 'stoma' bag over the site for a few weeks, after which the fistula closed spontaneously.
- A large nephrostomy tube, about the same diameter as a little finger, is required for a few days following the operation to drain urine from the kidney. This will pass from the kidney through the skin and is attached to a urine bag. These tubes can be uncomfortable.
- When the nephrostomy tube is removed, the flow of urine from the site where the tube was will usually stop within a few hours. You will need a small dressing over the site of the tube for a few days. Occasionally drainage of quite large volumes of urine can continue for a few days and in this situation a special bag will be placed over the drainage site to collect the urine. In the great majority of patients this drainage will slow down and then stop over the course of a few days. If it persists for more than a week or so, we may need to readmit you to hospital for insertion of a special internalised drainage tube called a JJ stent. This is inserted under local or general anaesthetic and runs from the kidney, down the ureter tube and to the bladder. The leakage of urine will then usually stop and the JJ stent can be removed under local anaesthetic a few weeks later.

Please attach patient sticker

- Rarely the drainage site will not heal and a communication between the kidney and the skins develops (a so-called nephrocutaneous fistula) which may require a further operation to close the fistula.

- Damage to the lining of the lung (pleura) and to the lung can occur and may require a chest drain (a large tube passing between 2 of the ribs) for a few days. This is an uncommon complication.

- Complete stone removal may not be possible, and in this situation you may require further treatment such as another PCNL at a later date, shock wave treatment (ESWL) or ureteroscopy. A significant proportion of patients do have to undergo further stone treatment after PCNL.

- Occasionally more than one puncture site may be required to get access to all of the stones.

- Blood poisoning ('septicaemia') is uncommon, but is a serious, potentially life-threatening complication which will require several days of antibiotic treatment and, less commonly, admission to ITU (the Intensive Therapy Unit).

- Absorption of large volumes of the fluid that the surgeon uses while performing the operation can occur, leading, uncommonly, to heart failure (uncommon but potentially life-threatening).

- Fragments of stone can be knocked down the ureter and may require telecopic (ureteroscopic) removal under general anaesthetic on several occasions at a later date. Over the last 6 years we have had to perform ureteroscopy in 2 patients who had several stones lodged in their ureter tubes after PCNL.

General Risks of Surgery

The following potential complications can occur. Though they do not happen that often, when they do occur they are **serious** and potentially **life-threatening**.

- Deep venous thrombosis (DVT or clots in the legs) which can dislodge and become lodged in the lungs (pulmonary embolism or PE). This causes serious breathing problems, sometimes requiring admission to ITU (Intensive Therapy Unit). DVT and PE will require months of treatment with warfarin, a blood thinning drug.

- Stroke, leading to permanent loss of the ability to use an arm or hand, or of the ability to walk or talk. As stated above, in our hands, over the last 6 years one patient has died as consequence of a stroke, following PCNL.

- Heart attack (myocardial infarction).

- Anaesthetic or other heart problems can occur, sometimes requiring ITU admission.

- Septicaemia (blood poisoning), requiring days of intravenous antibiotic treatment (antibiotic treatment into a vein), occasionally requiring admission to ITU.

- Wound, chest or urinary infection requiring antibiotic treatment.

Please attach patient sticker

I have read and understand the explanation of PCNL and consent to the procedure

……	……	……
Patient signature	Patient name (print)	date:
……	……	……
Doctor/Nurse signature	Doctor/Nurse name (print)	date: