



JAMES BUCHANAN BRADY UROLOGICAL INSTITUTE

PERCUTANEOUS NEPHROLITHOTOMY (PCNL)

OVERVIEW

Kidney stones are formed in the urinary tract due to crystallization of chemical compounds in the urine. PCNL is a technique used to remove certain stones in the kidney or upper ureter (the tube that drains urine from the kidney to the bladder) that are too large for other forms of stone treatment (e.g. shock wave lithotripsy, ureteroscopy).

OUR SURGEONS

Brian R. Matlaga, M.D., M.P.H.



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APPOINTMENTS

For appointments please use the phone numbers listed above.

In the event of an emergency and you need to contact someone in the evening hours or on the week end, please call the paging operator at **410-955-6070** (for Johns Hopkins Hospital Patients) or **410-550-0100** (for Johns Hopkins Bayview Medical Center Patients) and ask to speak to the urologist on call. For **directions to Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center** please use this link <http://urology.jhu.edu/patients>

PRIOR TO THE SURGERY

What to expect during you preoperative consultation

During your initial consultation with your surgeon, he will review your medical history as well as any outside reports, records, and outside Xray films (e.g. KUB, CT scan, MRI, sonogram). A brief physical examination will also be performed at the time of your visit. If your surgeon determines that you are a candidate for surgery, you will then meet with a Patient Service Surgery Coordinator to arrange for the date of your operation.

NOTE: It is very important that you gather and bring **ALL of your Xray films and REPORTS** to your initial consultation with your surgeon.

What to expect prior to the surgery

Since insurance companies will not permit patients to be admitted to the hospital the day before surgery to have tests completed, you must make an appointment to have pre-operative testing done at your family doctor or primary care physician's office within 1 month prior to the date of surgery.

For Johns Hopkins Hospital Patients : These results need to be faxed by your doctor's office to the Pre-operative Evaluation Center at **443-287-9358** two weeks prior to your surgery. Please call The Documentation Center at **410-955-9453** two weeks before your surgery date to confirm that this information was received.

For Johns Hopkins Bayview Medical Center Patients : These results need to be faxed by your doctor's office to the Pre-operative Evaluation Center at **410-550-1391** one week prior to your surgery. Please call The Documentation Center at **410-550-2495** before your surgery date to confirm that this information was received.

Once your surgical date is secured, you will receive a form along with a letter of explanation to take to your primary care physician or family doctor in order to have the following pre-operative testing done prior to your surgery.

- Physical exam
- EKG (electrocardiogram)
- CBC (complete blood count)
- PT / PTT (blood coagulation profile)
- Comprehensive Metabolic Panel (blood chemistry profile)
- Urinalysis

Preparation for surgery

Medications to Avoid Prior to Surgery

• Aspirin, Motrin, Ibuprofen, Advil, Alka Seltzer, Vitamin E, Ticlid, Coumadin, Lovenox, Celebrex, Voltaren, Vioxx, Plavix and some other arthritis medications can cause bleeding and **should be avoided 1 week prior to the date of surgery** (Please contact your surgeon's office if you are unsure about which medications to stop prior to surgery. Do not stop any medication without contacting the prescribing doctor to get their approval).

It is very important that your last urine culture was negative prior to having this procedure. Please call the physician's office at least one week before this procedure to confirm your urine culture results. If you suspect that you may have a urinary tract infection, please call the physician office immediately so that proper antibiotics can be prescribed before your surgery.

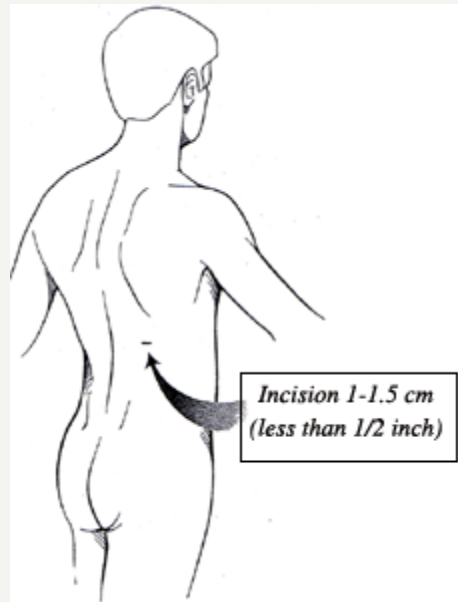
THE SURGERY

The Operation

This procedure has been performed on many patients over the last several years and is accepted standard of care for patients with kidney stones that are large, very firm, or resistant to other forms of stone treatment. As such it has replaced open operations for kidney stones in the vast majority of patients.

Typically, the length of the surgery is 3-4 hours. The surgery is performed by making a small 1 cm incision in the patient's flank area (Figure 1). A tube is placed through the incision into the kidney under x-ray guidance. A small telescope is then passed through the tube in order to visualize the stone, break it up and remove it from the body. If necessary a laser or other device called a lithotripter may be used to break up the stone before it can be removed. This procedure has resulted in significantly less post-operative pain, a shorter hospital stay, and earlier return to work and daily activities when compared to open stone surgery.

This technique also has a higher success rate for clearing all stones in one setting than other techniques such as extracorporeal shock wave lithotripsy (ESWL), which often require several attempts.



Video Clips

The view video clips that demonstrate key steps of a laparoscopic nephrectomy for removal of a left kidney tumor please use this link: http://urology.jhu.edu/MIS/lap_PCNL.php?color=3#video

Warning: these video clips include footage from an actual surgery which some viewers may find difficult to watch.

Potential Risks and Complications

Although this procedure has proven to be very safe, as in any surgical procedure there are risks and potential complications. The safety and complication rates are similar when compared to the open surgery. Potential risks include:

- **Bleeding:** Some blood loss will occur with this procedure but rarely do patients require a blood transfusion. If you are interested in autologous blood transfusion (donating your own blood) you must make your surgeon aware. When the packet of information is mailed to you regarding your surgery, you will also receive an authorization form for you to take to the Red Cross. You must coordinate this with the Red Cross in your area.
- **Infection:** All patients are treated with broad-spectrum antibiotics to decrease the chance of infection from occurring after surgery. If you develop any signs or symptoms of infection after the surgery (fever, drainage from incision, urinary frequency/discomfort, pain or anything that you may be concerned about) please contact us at once.
- **Tissue / Organ Injury:** Although uncommon, possible injury to surrounding tissue/organs including bowel, vascular structures, spleen, liver, lung, pancreas and gallbladder could require further surgery. Loss of kidney function is rare but is a potential risk. Scar tissue may also form in the kidney or ureter requiring

further surgery.

- **Conversion to open surgery:** This surgical procedure may require conversion to the standard open operation if difficulty is encountered during this procedure. This could result in a larger standard open incision and possibly a longer recuperation period.
- **Failure to Remove the Stone:** There is a possibility that the stone(s) may not be able to be removed completely, usually either due to the size or location of the stone(s). Additional treatment may be required.

WHAT TO EXPECT AFTER SURGERY

During your hospitalization

Immediately after the surgery you will be taken to the recovery room, then transferred to your hospital room once you are fully awake and your vital signs are stable.

- **Post-operative pain:** Pain medication can be controlled and delivered by the patient via an intravenous catheter or by injection (pain shot) administered by the nursing staff.
- **Nephrostomy Tube:** You can expect to have a small tube called a nephrostomy tube coming out of your back to allow urine to drain from the kidney into a drainage bag. The nephrostomy tube typically remains in place for 1-2 days. There is a possibility that you will be discharged from the hospital with the nephrostomy tube as deemed necessary by your surgeon.
- **Stent:** You may have an internal ureteral stent in place within the ureter between the kidney to the bladder to promote drainage from the kidney. This will be removed in your surgeon's office in typically 1-2 weeks following surgery.
- **Nausea:** You may experience some nausea related to the anesthesia. Medication is available to treat persistent nausea.
- **Urinary Catheter:** You can expect to have a urinary catheter draining your bladder (which is placed in the operating room while the patient is asleep) for approximately one day after the surgery. It is not uncommon to have blood-tinged urine for a several days after surgery.
- **Diet:** You can expect to have an intravenous catheter (IV) in for 1-2 days. (An IV is a small tube placed into your vein so that you can receive necessary fluids and stay well hydrated until you are able to tolerate a diet; in addition it provides a way to receive medication). Most patients are able to tolerate ice chips and small sips of liquids the day of the surgery and regular food the next day. Once on a regular diet, pain medication can be given by mouth instead of by IV or shot.
- **Fatigue** is common and should subside in a few weeks following surgery.
- **Incentive Spirometry:** You will be expected to do some very simple breathing exercises to help prevent respiratory infections through use of an incentive spirometry device (these exercises will be explained to you during your hospital stay). Coughing and deep breathing is an important part of your recuperation and helps prevent pneumonia and other pulmonary complications.
- **Ambulation:** On the day after your surgery it is very important to get out of bed and begin walking with

the supervision of your nurse or family member to help prevent blood clots from forming in your legs. You can expect to have SCDs (sequential compression devices) along with tight white stockings on your legs to also aid in the prevention of blood clots.

- **Hospital Stay:** The length of hospital stay for most patients is approximately 1-2 days.
- **Constipation:** You may experience sluggish bowels for several days or several weeks following surgery. Suppositories and stool softeners can be taken to help with this problem. Taking mineral oil at home will also help to prevent constipation.
- **Secondary Procedures:** Some patients have stones that are very large or that cannot be safely removed at one setting. You may need a "second look" operation to remove any remaining stones, either during the hospitalization or at another visit.

What to expect after discharge from the hospital

- **Pain Control:** you can expect to have some pain that may require pain medication for a few days after discharge. Most patients, however, find that Tylenol is sufficient to control the incisional pain.
- **Showering:** You may shower at home. Your wound site can get wet, but must be patted dry afterwards. Tub baths can soak your incision and therefore are not recommended in the first 2 weeks after surgery.
- **Activity:** Taking daily walks is advised. Prolonged sitting or lying in bed should be avoided. Climbing stairs is possible, however, should be taken slowly. Driving should be avoided for at least 1-2 weeks after surgery. After this time, activity can begin as tolerated. You can expect to return to work as soon as 1-2 weeks following surgery or as instructed by your physician.
- **Follow-up Appointment:** You will need to call The Johns Hopkins Out Patient Center (410-955-6707) or Johns Hopkins Bayview (410-550-7008) soon after your discharge to schedule a follow up visit. .
- **Stent Follow-up:** The length of time the stent remains in place is variable. Your doctor will probably request it to be removed within a 1-4 week period. This can be removed in the doctor's office. It is common to feel a slight amount of flank fullness and urgency to void as a result of the stent. These symptoms often improve over time as the body adjusts to the indwelling stent. **It is critical that patients return to have their stent removed as instructed by their physician as a prolonged indwelling ureteral stent can result in encrustation by stone debris, infection, and obstruction of the kidney.**
- **Nephrostomy Site Care:** If you are discharge home with a nephrostomy in place, it is important that urine flow freely through the tube. Check daily to make sure the tube is not kinked. Make sure the stopcock, if present, remains in the open position to allow urine to drain from the kidney. Keep the tube securely anchored o the skin with tape to prevent pulling and to keep the tube in place. Monitor the amount of drainage and color. Blood tinged urine is not uncommon. Keep the drainage bag below the level of the kidney at all times. It is important to clean the area around the insertion site with mild soap and water each day when you shower. Pat the area dry after showering and clean directly around the insertion site with hydrogen peroxide using a cotton tip applicator. Apply a clean sterile dressing after cleaning the area. If you experience any change in pain, fever, chills, pus forming around the insertion site, the catheter not draining or leaking around the tube you must contact your doctor immediately.