



Ureteral Stenting and Nephrostomy

What are Ureteral Stenting and Nephrostomy?

Urine is normally carried from the kidneys to the bladder through long, narrow tubes called ureters. The ureter can become obstructed due to conditions such as kidney stones, tumors, infection, or blood clots. When this happens, physicians can use image guidance to place stents or tubes in the ureter to restore the flow of urine to the bladder.

A ureteral stent is a thin, flexible tube threaded into the ureter. When it is not possible to insert a ureteral stent, nephrostomy is performed. During this procedure, a tube is placed through the skin on the patient's back into the kidney. The tube is connected to an external drainage bag or from the kidney to the bladder.

How should I prepare?

You may have blood drawn prior to your procedure.

Prior to your procedure, your blood may be tested to determine how well your liver and kidneys are functioning and whether your blood clots normally.

You should report to your doctor all medications that you are taking, including herbal supplements, and if you have any allergies, especially to local anesthetic medications, general anesthesia or to contrast materials containing iodine (sometimes referred to as "dye" or "x-ray dye"). Your physician may advise you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners for a specified period of time before your procedure.

Also inform your doctor about recent illnesses or other medical conditions.

Women should always inform their physician and x-ray technologist if there is any possibility that they are pregnant. Many imaging tests are not performed during pregnancy so as not to expose the fetus to radiation. If an x-ray is necessary, precautions will be taken to minimize radiation exposure to the baby. See the Safety page (www.RadiologyInfo.org/en/safety/) for more information about pregnancy and x-rays.

In general, you should not eat or drink for eight hours before your procedure. However, you may take your routine medications with sips of water. If you are diabetic and take insulin, you should talk to your doctor as your usual insulin dose may need to be adjusted.

You will be given a gown to wear during the procedure.

You should plan to have a relative or friend drive you home after your procedure.

What does the equipment look like?

During ureteral stenting, a fluoroscope and a guide wire are used to place a stent down the ureter.

A guide wire may be inserted with the aid of a fluoroscope, an imaging device that uses x-rays to see structures on a fluorescent screen.

A stent is five to 10 inches long and less than a quarter inch thick.

During a nephrostomy, a fluoroscope, or an ultrasound, and a needle are used to place a catheter in the kidney.

A catheter is a long, thin plastic tube, smaller than a pencil.

Ultrasound scanners consist of a console containing a computer and electronics, a video display screen and a transducer that is used to do the scanning. The transducer is a small hand-held device that resembles a microphone, attached to the scanner by a cord. The transducer sends out inaudible high frequency sound waves into the body and then listens for the returning echoes from the tissues in the body. The principles are similar to sonar used by boats and submarines.

The ultrasound image is immediately visible on a video display screen that looks like a computer or television monitor. The image is created based on the amplitude (strength), frequency and time it takes for the sound signal to return from the area of the patient being examined to the transducer and the type of body structure the sound travels through.

Other equipment that may be used during the procedure includes an intravenous line (IV) and equipment that monitors your heart beat and blood pressure.

How are these procedures performed?

Image-guided, minimally invasive procedures such as ureteral stenting and nephrostomy are most often performed by a specially trained interventional radiologist in an interventional radiology suite or occasionally in the operating room.

This procedure is often done on an outpatient basis. However, some patients may require admission following the procedure. Please consult with your physician as to whether or not you will be admitted.

Prior to your procedure, ultrasound, computed tomography (CT) or magnetic resonance imaging (MRI) may be performed.

You may be given medications to help prevent nausea and pain, and antibiotics to help prevent infection.

You may be connected to monitors that track your heart rate, blood pressure and pulse during the procedure.

A nurse or technologist will insert an intravenous (IV) line into a vein in your hand or arm so that sedative medication can be given intravenously. Alternatively, you may receive general anesthesia.

If you receive a general anesthetic, you will be unconscious for the entire procedure, and you will be monitored by an anesthesiologist.

The area of your body where the catheter is to be inserted will be shaved, sterilized and covered with a surgical drape.

Your physician will numb the area with a local anesthetic.

The interventional radiologist will use x-rays and/or ultrasound to locate your kidney and a needle will be inserted through your skin into the kidneys. Contrast dye will be injected through the needle.

During ureteral stenting, you will be positioned on your stomach. Using a fluoroscope to see inside the ureter, a guide wire is inserted into the ureter. The stent is run over the guide wire and placed in its permanent position within the ureter. Once the stent has been placed, the guide wire may be removed, or a nephrostomy catheter may be left in place for a day or two and then removed.

At the end of the procedure, the catheter will be removed and pressure will be applied to stop any bleeding. The opening in the skin is then covered with a dressing. No sutures are needed.

During nephrostomy, you will be positioned on your stomach. Using a fluoroscope to see inside the kidney a guide wire is inserted into the kidney, followed by a catheter. This will be left in place until a ureteral stent can be placed or the ureteral blockage is resolved.

Your intravenous line will be removed.

Both procedures are usually completed within one hour.

What will I experience during and after the procedure?

Devices to monitor your heart rate and blood pressure will be attached to your body.

You will feel a slight pin prick when the needle is inserted into your vein for the intravenous line (IV) and when the local anesthetic is injected.

If the case is done with sedation, the intravenous (IV) sedative will make you feel relaxed and sleepy. You may or may not remain awake, depending on how deeply you are sedated.

You may feel the catheter going into the kidney and down the ureter. During placement of a ureteral stent, you may feel the guide wire go into the bladder until the stent is placed.

You will remain in the recovery room until you are completely awake and ready to return home.

As the contrast material passes through your body, you may get a warm feeling.

You will not feel when the contrast is excreted into the urine.

You should be able to resume your normal activities within a few days.

Who interprets the results and how do I get them?

The interventional radiologist can advise you as to whether the procedure was a technical success when

it is completed.

Your interventional radiologist may recommend a follow-up visit after your procedure or treatment is complete.

The visit may include a physical check-up, imaging procedure(s) and blood or other lab tests. During your follow-up visit, you may discuss with your doctor any changes or side effects you have experienced since your procedure or treatment.

What are the benefits vs. risks?

Benefits

- A ureteral stent or nephrostomy catheter will allow urine to flow again from the kidney and permit the kidney to function normally.

Risks

- Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- Rarely, you may experience ongoing spasm of the bladder after placement of a ureteral stent. If this happens, notify your doctor. This spasm may be treated with medication.
- There is a very slight risk of an allergic reaction if contrast material is injected.

Disclaimer

This information is copied from the RadiologyInfo Web site (<http://www.radiologyinfo.org>) which is dedicated to providing the highest quality information. To ensure that, each section is reviewed by a physician with expertise in the area presented. All information contained in the Web site is further reviewed by an ACR (American College of Radiology) - RSNA (Radiological Society of North America) committee, comprising physicians with expertise in several radiologic areas.

However, it is not possible to assure that this Web site contains complete, up-to-date information on any particular subject. Therefore, ACR and RSNA make no representations or warranties about the suitability of this information for use for any particular purpose. All information is provided "as is" without express or implied warranty.

Please visit the RadiologyInfo Web site at <http://www.radiologyinfo.org> to view or download the latest information.

Note: Images may be shown for illustrative purposes. Do not attempt to draw conclusions or make diagnoses by comparing these images to other medical images, particularly your own. Only qualified physicians should interpret images; the radiologist is the physician expert trained in medical imaging.

Copyright

This material is copyrighted by either the Radiological Society of North America (RSNA), 820 Jorie Boulevard, Oak Brook, IL 60523-2251 or the American College of Radiology (ACR), 1891 Preston White Drive, Reston, VA 20191-4397. Commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is prohibited.

Copyright © 2011 Radiological Society of North America, Inc.