Patient information: Renal biopsy

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INTRODUCTION — A renal biopsy is a procedure in which a sample of kidney (also called renal) tissue is obtained. Microscopic examination of the tissue can provide information needed to diagnose, monitor or treat a renal disorder.

REASONS FOR BIOPSY — Renal biopsy is recommended for selected patients with kidney disease. It is most commonly performed when less invasive measures are insufficient. The following are examples of the most common reasons for biopsy:

Hematuria with renal disease — Hematuria (blood in the urine) can occur with a number of conditions that affect the kidneys and urinary tract. While renal biopsy is not indicated in all cases of hematuria, it may be performed in those with hematuria as well as progressive renal disease (such as increasing proteinuria or blood pressure). (See "Patient information: Blood in the urine (hematuria)").

Proteinuria — Proteinuria (protein in the urine) occurs in many patients with renal conditions. Renal biopsy is usually reserved for patients with relatively high or increasing levels of proteinuria or for patients who have proteinuria along with other signs of renal dysfunction.

A patient with nephrotic syndrome (significant proteinuria, low blood albumin level, and edema (swelling) of the arms and legs) may need a renal biopsy, especially if the patient has systemic lupus erythematosus (SLE). Other patients with nephrotic syndrome may require a renal biopsy, depending upon the suspected cause of the nephrotic syndrome. (See "Patient information: Protein in the urine (proteinuria)" and see "Patient information: The nephrotic syndrome").

Acute renal failure — Renal failure refers to kidney injury that impairs kidney function. It can occur abruptly (called acute renal failure) or progress over a period of time (called chronic renal failure). The cause of acute renal failure can usually be determined without renal biopsy. Biopsy is performed in those instances when the cause is uncertain.

Acute nephritic syndrome — Patients with acute nephritic syndrome have hematuria, proteinuria, high blood pressure, and impaired renal function. Renal biopsy may be recommended to determine the cause of nephritic syndrome unless it can be determined through blood testing.

PROCEDURE

Preparation — Testing may be done before the biopsy to ensure that there is no evidence of infection or a blood clotting abnormality. The biopsy is usually performed while the patient is awake, after receiving an injection of local anesthesia (numbing medicine) to minimize pain.

To decrease the risk of bleeding, patients are usually advised to avoid medicines that increase the risk of bleeding (such as aspirin or nonsteroidal antiinflammatory drugs (ibuprofen, naproxen)) for one to two weeks before the biopsy. If the patient takes warfarin or heparin (drugs that impair clotting and increase the risk of bleeding), the physician will give specific instructions about the dose and time to take these medications before surgery.

Biopsy procedure — In most cases, an ultrasound is done to guide the physician inserting the needle. Less commonly, computed tomography (CT scan) guidance is used. The needle is inserted through the skin in the back and into the kidney. Once the needle is in contact with the kidney, a sample of renal tissue is withdrawn.

In some patients, a different approach may be used to perform the biopsy. In this case, the patient is sedated and a small skin incision is made to obtain the sample of kidney tissue; this procedure is called open renal biopsy.

Following the biopsy, the patient is kept in the post-operative recovery unit for several hours to monitor for potential complications, including pain and bleeding.

COMPLICATIONS — Serious complications of renal biopsy are rare.

Bleeding — Bleeding is the most common complication of renal biopsy. Rarely, bleeding is severe enough to require a blood transfusion or surgery. Most patients who undergo renal biopsy notice blood in the urine for several days after the procedure. Patients with urine that is bright red or brown for longer than one week should consult with their healthcare provider.

Pain — Pain is a common problem, although it is usually mild to moderate and resolves within a few hours. Medications can be given to reduce pain after the procedure. Patients who experience severe or prolonged pain should notify their healthcare provider; this can be a sign of a blood clot that is obstructing the ureter (tube that leads to the bladder) or a large hematoma (a mass of clotted blood) that stretches the kidney.

Arteriovenous fistula — Damage caused by the biopsy needle to the walls of an adjacent artery and vein can lead to a fistula (a connection between the two blood vessels). Fistulas generally do not cause problems and usually close on their own over time.

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem. Because no two patients are exactly alike and recommendations can vary from one person to another, it is important to seek guidance from a provider who is familiar with your individual situation.

This discussion will be updated as needed every four months on our web site (www.patients.uptodate.com). Additional topics as well as selected discussions written for healthcare professionals are also available for those who would like more detailed information.

A number of web sites have information about medical problems and treatments, although it can be difficult to know which sites are reputable. Information provided by the National Institutes of Health, national medical societies and some other well-established organizations are often reliable sources of information, although the frequency with which they are updated is variable.

- National Library of Medicine

  (www.nlm.nih.gov/medlineplus/healthtopics.html)

- National Institute of Diabetes and Digestive and Kidney Diseases

  (www.niddk.nih.gov)

- National Kidney Foundation

  (www.kidney.org)