



## Ultrasound - Scrotum

Ultrasound imaging of the scrotum uses sound waves to produce pictures of a man's testicles and surrounding tissues. It is the primary method used to help evaluate disorders of the testicles, epididymis (a tube immediately next to a testicle that collects sperm) and scrotum. Ultrasound is safe, noninvasive, and does not use ionizing radiation.

This procedure requires little to no special preparation. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown.



## What is Ultrasound Imaging of the Scrotum?

Ultrasound imaging of the scrotum provides pictures of a male's testicles and the surrounding tissues.

Ultrasound is safe and painless, and produces pictures of the inside of the body using sound waves. Ultrasound imaging, also called ultrasound scanning or sonography, involves the use of a small transducer (probe) and ultrasound gel placed directly on the skin. High-frequency sound waves are transmitted from the probe through the gel into the body. The transducer collects the sounds that bounce back and a computer then uses those sound waves to create an image. Ultrasound examinations do not use ionizing radiation (as used in x-rays), thus there is no radiation exposure to the patient. Because ultrasound images are captured in real-time, they can show the structure and movement of the body's internal organs, as well as blood flowing through blood vessels.

Ultrasound imaging is a noninvasive medical test that helps physicians diagnose and treat medical conditions.

## What are some common uses of the procedure?

Ultrasound imaging of the scrotum is the primary imaging method used to evaluate disorders of the testicles, epididymis (a tube immediately next to a testis that collects sperm made by the testicle) and

scrotum.

This study is typically used to:

- determine whether a mass in the scrotum felt by the patient or doctor is cystic or solid and its location.
- diagnose results of trauma to the scrotal area.
- diagnose causes of testicular pain or swelling such as inflammation or torsion.
- evaluate the cause of infertility such as varicocele.
- look for the location of undescended testis.

A sudden onset of pain in the scrotum should be taken very seriously. The most common cause of scrotal pain is epididymitis, an inflammation of the epididymis. It is treatable with antibiotics. If left untreated, this condition can lead to an abscess or loss of blood flow to the testicles.

Ultrasound can often detect an absent or undescended testicle as well. It is estimated that approximately three percent of full-term baby boys have an undescended testicle. The testicle normally migrates from the abdomen down a short passage called the inguinal canal and then into the usual position in the scrotal sac before birth. If not present in the scrotal sac, the testicle may have stopped in the inguinal region, in which case the ultrasound examination will often see it. If the testicle has not left the abdominal cavity, it may not be seen by sonography. If a testicle is not detected, a urologist may be consulted in order to decide whether additional imaging such as an MRI is needed to determine its location. If the testicle is found to be in the inguinal region, it may be moved into the scrotum. If left in the abdomen too long, the testicle may become cancerous and may need to be removed.

Ultrasound can identify testicular torsion, the twisting of the spermatic cord that contains the vessels that supply blood to the testicle. Testicular torsion is caused by abnormally loose attachments of tissues that are formed during fetal development. Torsion commonly appears during adolescence, and less often in the neonatal period, and is very painful. Torsion requires immediate surgery to avoid permanent damage to the testicle.

Ultrasound also can be used to locate and evaluate masses (lumps or tumors) in the testicle or elsewhere in the scrotum. Collections of fluid and abnormalities of the blood vessels may appear as masses and can be assessed by ultrasound. Masses both outside and within the testicles may be benign or malignant and should be evaluated as soon as they are detected.

## How should I prepare?

You should wear comfortable, loose-fitting clothing for your ultrasound exam. You may need to remove all clothing and jewelry in the area to be examined.

You may be asked to wear a gown during the procedure.

No other preparation is required.

If your son is undergoing the examination, explain the procedure to him. In most cases, you will be able to accompany him into the examination room for support and reassurance.

## What does the equipment look like?

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. Some exams may use different transducers (with different capabilities) during a single exam. The transducer sends out high-frequency sound waves (that the human ear cannot hear) 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 (loudness), frequency (pitch) and time it takes for the ultrasound signal to return from the area within the patient that is being examined to the transducer (the device placed on the patient's skin to send and receive the returning sound waves), as well as the type of body structure and composition of body tissue through which the sound travels. A small amount of gel is put on the skin to allow the sound waves to travel from the transducer to the examined area within the body and then back again. Ultrasound is an excellent modality for some areas of the body while other areas, especially air-filled lungs, are poorly suited for ultrasound.

In order to perform a scrotal sonogram, most commonly a linear small parts transducer is used.

## How does the procedure work?

Ultrasound imaging is based on the same principles involved in the sonar used by bats, ships and fishermen. When a sound wave strikes an object, it bounces back, or echoes. By measuring these echo waves, it is possible to determine how far away the object is as well as the object's size, shape and consistency (whether the object is solid or filled with fluid).

In medicine, ultrasound is used to detect changes in appearance, size or contour of organs, tissues, and vessels or to detect abnormal masses, such as tumors.

In an ultrasound examination, a transducer both sends the sound waves into the body and receives the echoing waves. When the transducer is pressed against the skin, it directs small pulses of inaudible, high-frequency sound waves into the body. As the sound waves bounce off internal organs, fluids and tissues, the sensitive receiver in the transducer records tiny changes in the sound's pitch and direction. These signature waves are instantly measured and displayed by a computer, which in turn creates a real-time picture on the monitor. One or more frames of the moving pictures are typically captured as still images. Short video loops of the images may also be saved.

## How is the procedure performed?

For most ultrasound exams, you will be positioned lying face-up on an examination table that can be tilted or moved. Patients may be turned to either side to improve the quality of the images.

After you are positioned on the examination table, the radiologist (a physician specifically trained to supervise and interpret radiology examinations) or sonographer will apply a warm water-based gel to the area of the body being studied. The gel will help the transducer make secure contact with the body and eliminate air pockets between the transducer and the skin that can block the sound waves from passing into your body. The transducer is placed on the body and moved back and forth over the area of interest until the desired images are captured.

There is usually no discomfort from pressure as the transducer is pressed against the area being examined. However, if scanning is performed over an area of tenderness, you may feel pressure or minor pain from the transducer.

Once the imaging is complete, the clear ultrasound gel will be wiped off your skin. Any portions that are not wiped off will dry quickly. The ultrasound gel does not usually stain or discolor clothing.

## What will I experience during and after the procedure?

Ultrasound examinations are painless and easily tolerated by most patients.

Ultrasound imaging of the scrotum is usually completed within 15 to 30 minutes, though sometimes more time is necessary.

If you are accompanying your son during the procedure, ask him to lie still so the sound waves can produce the proper images.

Babies undergoing the examination might cry, but this should not interfere with the procedure.

When the examination is complete, you may be asked to dress and wait while the ultrasound images are reviewed.

After an ultrasound examination, you should be able to resume your normal activities immediately.

## Who interprets the results and how do I get them?

A radiologist, a physician specifically trained to supervise and interpret radiology examinations, will analyze the images and send a signed report to your primary care physician, or to the physician or other healthcare provider who requested the exam. Usually, the referring physician or health care provider will share the results with you. In some cases, the radiologist may discuss results with you at the conclusion of your examination.

Follow-up examinations may be necessary. Your doctor will explain the exact reason why another exam is requested. Sometimes a follow-up exam is done because a potential abnormality needs further evaluation with additional views or a special imaging technique. A follow-up examination may also be necessary so that any change in a known abnormality can be monitored over time. Follow-up examinations are sometimes the best way to see if treatment is working or if a finding is stable or changed over time.

## What are the benefits vs. risks?

### Benefits

- Most ultrasound scanning is noninvasive (no needles or injections).
- Occasionally, an ultrasound exam may be temporarily uncomfortable, but it should not be painful.
- Ultrasound is widely available, easy-to-use and less expensive than other imaging methods.
- Ultrasound imaging is extremely safe and does not use any ionizing radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.
- Ultrasound provides real-time imaging, making it a good tool for guiding minimally invasive procedures such as needle biopsies and fluid aspiration.

### Risks

- For standard diagnostic ultrasound, there are no known harmful effects on humans.

## What are the limitations of Scrotal Ultrasound Imaging?

Ultrasound of the scrotum is helpful for finding abnormalities such as masses in the scrotum or testicles. However, it does not always permit an exact diagnosis (i.e., the exact type of tissue a mass is composed of, especially when the mass is solid). Blood flow images of the testicles are not always reliable in determining the presence or absence of blood supply to a testicle that has twisted. When searching for an absent testicle, ultrasound may not be able to find it if it is located in the abdomen because gas filled bowel loops may block the view.

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