Prostate Ultrasound

This procedure is reviewed by a physician with expertise in the area presented and is further reviewed by committees from the American College of Radiology (ACR) and the Radiological Society of North America (RSNA), comprising physicians with expertise in several radiologic areas.

What is Ultrasound Imaging of the Prostate?

Ultrasound imaging, also called ultrasound scanning or sonography, involves exposing part of the body to high-frequency sound waves to produce pictures of the inside of the body. Ultrasound exams do not use ionizing radiation (x-ray). Because ultrasound images are captured in real-time, they can show the structure and movement of the body’s internal organ, as well as blood flowing through blood vessels.

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

The prostate or transrectal ultrasound provides pictures of a man's prostate gland. It is a minimally invasive ultrasound because it sends sound waves through the rectum.

What are some common uses of the procedure?

A transrectal ultrasound of the prostate gland is performed to:

- detect disorders within the prostate
- determine whether the prostate is enlarged
- detect an abnormal growth within the prostate
- help diagnose a man’s infertility

A transrectal ultrasound of the prostate gland is typically used to help diagnose symptoms such as:

- a nodule is felt by a physician during a routine physical exam or prostate cancer screening exam
- an elevated blood test result

Because ultrasound provides real-time images, it also can be used to guide procedures such as needle biopsies, in which a needle is used to sample cells from an abnormal area for laboratory testing.

How should I prepare?

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

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

An enema is taken two to four hours before the ultrasound to clean out the bowel. A full bladder helps with visualization of the prostate gland, so you may be asked to drink up to six glasses of water prior to your exam.

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 scan the body. The transducer is a small hand-held device that resembles a microphone, attached to the scanner by a cord. The transducer sends out a high frequency sound wave and then listens for a returning sound wave or “echo”.

The ultrasound image is immediately visible on a nearby screen that looks much 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 patient to the transducer.

For ultrasound procedures requiring insertion of the transducer, such as transvaginal, transrectal and hysterosonography exams, the device is covered and lubricated.
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 backward, or echoes. By measuring these echo waves it is possible to determine how far away the object is and its size, shape, consistency (whether the object is solid, filled with fluid, or both) and uniformity.

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

In an ultrasound examination, a transducer both sends the sound waves and records the echoing waves. When the transducer is pressed against the skin, it directs a stream of inaudible, high-frequency sound waves into the body. As the sound waves bounce off of internal organs, fluids and tissues, the sensitive microphone 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. These live images are usually recorded on videotape and one or more frames of the moving pictures are typically captured as still images.

The same principles apply to the ultrasound procedures such as transrectal, transvaginal and hysterosonography exams, which require insertion of a special transducer into a natural opening in the body.

How is the procedure performed?

In men, the prostate gland is located directly in front of the rectum, so the ultrasound exam is performed transrectally.

For a transrectal ultrasound, a protective cover is placed over the transducer, it is lubricated and then placed into the rectum.

The images are obtained from different angles to get the best view of the prostate gland. Ultrasound of the prostate is most often performed with the patient lying on his left side with his knees bent up slightly.

If a suspicious lesion is identified with ultrasound or with a rectal examination, an ultrasound-guided biopsy can be performed. This procedure involves advancing a needle into the prostate gland while the radiologist watches the needle placement with ultrasound. A small amount of tissue is taken for microscopic examination. Below is an example of a transrectal transducer (probe).

When the examination is complete, the patient may be asked to dress and wait while the ultrasound images are reviewed. However, the sonographer or radiologist is often able to review the ultrasound images in real-time as they are acquired and the patient can be released immediately.

This ultrasound examination is usually completed within 20 minutes.

What will I experience during and after the procedure?

Most ultrasound examinations are painless, fast and easy.

Ultrasound exams in which the transducer is attached to probe and inserted into an opening of the body may produce minimal discomfort.

If no biopsy is required, transrectal ultrasound of the prostate is similar in discomfort to a rectal exam performed by your doctor.

If a biopsy is performed, additional discomfort, due to the needle insertion, is usually minimal because the rectal wall is relatively insensitive in the region of the prostate. A biopsy will add time to the procedure.

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

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 or referring physician, who will share the results with you. In some cases the radiologist may discuss preliminary results with you at the conclusion of your examination.

What are the benefits vs. risks?

Benefits

- Ultrasound scanning is noninvasive (no needles or injections) and is usually painless.
- Ultrasound is widely available, easy-to-use and less expensive than other imaging methods.
- Ultrasound imaging uses no ionizing radiation.
• Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.

• Ultrasound causes no health problems and may be repeated as often as is necessary if medically indicated.

• Ultrasound provides real-time imaging, making it a good tool for guiding minimally invasive procedures such as needle biopsies and needle aspiration of fluid in joints or elsewhere.

Risks

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

What are the limitations of Prostate Ultrasound Imaging?

Men who have had recent surgery on their bowel are not good candidates for ultrasound of the prostate gland because this type of ultrasound requires placing a probe into the rectum.

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