Ultrasound of the upper abdominal organs

Procedure: Us
Bodypart: Abdomen
Patient Group: Female Male Child

Summary

Synonyms: Sonography

Ultrasound (US) of the upper abdominal organs is a classic ultrasound procedure. Of the diagnostic sectional imaging techniques (US, CT, MRI) ultrasound is the most common and usually the first procedure used, since it is widely available and fairly inexpensive; it is also non-invasive and therefore repeatable. There is no radiation, and very significant diagnostic information can be gained from images of the organs. US is also an excellent way of visualising the blood vessels, since blood flow can also be displayed. The procedure provides a rapid overview of changes in the upper abdominal organs (liver, gall bladder, pancreas, spleen, kidneys) as well as the blood vessels and lymph nodes of the upper abdomen.

Technique

What it is

Ultrasound of the organs in the upper abdomen is a technique in which high-frequency sound waves are used. Sound waves fan outwards from the ultrasound transducer and are then reflected back in different ways by the structures of the upper abdominal organs and their surroundings. These reflections or echoes are then received by the transducer. From the time sequence of these reflections, a computer can generate an image of the internal structures of the body. Different cross-sectional images can be created by varying the position and orientation of the transducer.
All this is done without the use of X-rays. The procedure is performed directly on the patient by a radiologist.

**How it works**

The patient lies on their back or side on an examination table. The ultrasound machine stands next to the examination table. It consists of a monitor, a computer and a transducer, which is connected to the machine by a cable. The radiologist uses a special gel between the body and the transducer to improve the transmission of sound waves into the tissues. As the radiologist moves the transducer over the examination area, images of the organs are displayed on the screen.

**Purpose**

Ultrasound of the upper abdominal organs is used to examine the liver, gall bladder, pancreas, spleen and kidneys, as well as blood vessels including the aorta (the largest artery in the abdomen). With ultrasound, a wide variety of diseases or complaints can be investigated (e.g. abdominal pain, liver disorders, gallstones, kidney stones and organ problems such as tumours and malformations). It is also possible to take samples from some organs (biopsies) under ultrasound guidance. With Doppler ultrasound, possible abnormalities of blood flow, such as thromboses or emboli (clots in the blood vessels), and narrowing or dilation of the blood vessels can also be investigated. If the results are inconclusive, further investigations may be necessary, such as computed tomography (CT scan) or magnetic resonance imaging (MRI).

**Target Patient Group**

Ultrasound of the upper abdominal organs is carried out for various medical and surgical diagnostic tasks. Examples are:

- Abdominal pain, distended abdomen
- Investigation of liver disorders (abnormal blood values)
- Enlarged upper abdominal organs, suspected tumour
- Looking for or ruling out metastases (spread of cancer to other parts of the body)
- Suspected inflammatory changes in upper abdominal organs (e.g. liver, gall bladder, pancreas)
- Stones in the gall bladder or kidneys
- Enlargement (aneurysm) of the abdominal aorta

**Procedure**

**Persons**

You will be looked after by an experienced team, consisting of a medical radiology technician (MRT) and a radiologist. The procedure itself will be carried out by the radiologist.

During the procedure, the radiologist observes and assesses the organs and takes several pictures, so-called standard sections, of the upper abdominal organs being examined. After the procedure, all the pictures are re-assessed and compared with a preliminary examination if necessary. A written report of the results is then drawn up. This is either given to you or sent on to the doctor who referred you.

**Preparation**

1. You should not have anything to eat for 4-6 hours before the procedure. You can drink as much water as you like. It is best to avoid food that produces flatulence for a few days before the procedure, since gas in the bowel can reduce the quality of the images.
2. You should take your usual daily medication with some liquid in the morning.
3. If you are a diabetic, please ask your doctor how you should take your medication on the day of the examination. If you feel that your blood sugar is low, please tell the MRT immediately.
Precautions
No precautions are necessary.

Duration
The whole procedure takes about 10 to 20 minutes.

Process
First, the area to be examined is uncovered (remove clothing and any jewellery in the area to be examined). Usually you will be lying on your left side when the procedure starts. The radiographer will apply a special gel to your skin - this improves the transmission of sound waves into the tissues.

Many organs may be seen more easily if you take a deep breath and hold it for a short time, because they are pushed downwards when you breathe in. The radiologist will let you know what to do if necessary. After the organs have been assessed while lying on your left side, further examination will be carried out while you lie on your back, and possibly on your right side as well. After the examination, you will be given a towel to wipe off the remaining ultrasound gel.

After procedure
You will usually be able to go straight home after the procedure, unless there are other medical reasons why you should not do so.

Consideration

Risks
Ultrasound is an extremely safe procedure. In rare cases, the pressure of the transducer may feel a little uncomfortable. The ultrasound waves are not harmful to the body. Pregnant patients and children can also be examined without safety concerns. No X-rays are used, so there is no exposure to radiation.

Alternatives
An additional or alternative technique that is often used initially for investigating abdominal pain, nausea and vomiting is an X-ray of the empty abdomen. However, this technique can only provide useful information on certain specific problems (e.g. blockage of the small or large intestine, air in the abdominal cavity, X-ray-opaque stones, foreign bodies that have been swallowed) and the precision and usefulness of this technique are limited. If the results are inconclusive, additional techniques are often used, such as computed tomography (CT) and magnetic resonance imaging (MRI). These techniques make it possible to identify and assess even the smallest changes.

FAQ
Do I have to be an in-patient in the hospital to have an ultrasound of the upper abdominal organs?
No, the procedure can be carried out if you are an out-patient. You can go straight home afterwards unless there are other medical reasons why you should not do so.

Which patients should not have an ultrasound?
In patients who are very overweight (obese) or bloated with gas, the quality of the images (and so the information they provide) may be very limited, so that another procedure may be necessary (e.g. computed tomography or magnetic resonance imaging). The quality of the examination results can also be significantly affected if you have had a prior procedure using barium contrast.

What do I need to bring with me?
Nothing.

How much radiation will I be exposed to?
Ultrasound is a mechanical sound wave with a very high frequency, and has no damaging effects on the body. No X-rays are used, so there is no exposure to radiation.
Citations

1 - Team General Hospital Vienna