



Summary of medical ultrasound

Introduction

Ultrasonography, or medical ultrasound, is a diagnostic imaging technique, used to generate an image of internal structures of human body such as muscles, tendons, blood vessels, internal organs. It also focuses often to exclude pathology or to find a source of a disease. Obstetric ultrasound is used for practice of examining pregnant women. It is an application of clinical ultrasonography and an early development.

Ultrasound sound waves frequencies are higher than hearing range of human beings (>20,000 Hz). The other name for Ultrasonic images, is sonograms, they are created when pulses of ultrasound are send into tissue using a probe. Different reflection properties are shown when the ultrasound pulses echo off tissues and they gets recorded and displayed as an image.

Various types of images are formed. In which B-mode image (Brightness), is the most usual where the acoustic impedance of a two-dimensional cross-section of tissue is displayed. They are other types that can display motion of tissue over time, the presence of specific molecules, the location of blood, blood flow, the anatomy of a three-dimensional region, or the stiffness of tissue.

Compared to other dominant methods of medical imaging, there are several advantages of ultrasound. The real-time images are portable and brought to the bedside. Than other imaging modalities it is considerable lower cost and does not use dangerous ionizing radiation. Numerous limits on its subject of view, such as dependence on physique, the need for patient cooperation, air or gases and difficulty imaging structures behind bone, and the need of a skilled operator, usually trained professional.

In medicine field; Sonography (ultrasonography) is widely used. To perform both therapeutic procedures and diagnosis, using ultrasound to conduct interventional procedures such as to drain collected fluid or biopsies. Which can be both therapeutic and diagnostic. Medical professional's sonographers perform scans which are then interpreted traditionally by radiologists. Physicians who are specialized in the interpretation of a wide variety of medical imaging modalities and application. Rapidly, healthcare professionals and physicians using the ultrasound in office and hospital practice (point-of-care ultrasound).

To provide patient care, for soft tissues imaging of the body Sonography is effective. Superficial structures such as tendon, muscle, breast, testis, neonatal brain parathyroid glands and thyroid are pictured at a higher frequency (7-18 MHz), which produce better horizontal (lateral) and linear (axial) resolution. Deep structures such as kidney and liver are pictured at a lower frequency 1-6 MHz with lateral resolution and lower axial as a cost of penetration of deep tissue.

A ultrasound transducer are used for general-purpose as well as most imaging purposes but in some cases specialized transducer requirement is needed. By the use of transducer most ultrasound procedures are done on the surface of the body, if a transducer can be placed inside the body improved diagnostic confidence is often possible. For this case, special use of transducers, including transesophageal, endorectal, and endovaginal transducers are mostly employed. At the major, very small transducers are used to image the walls and disease of those vessels when they are setup on small diameter catheters and placed into blood vessels.

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