

OBSTETRIC ULTRASOUND

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Ultra-sonography is the name given to sound waves with a frequency about that of the human ear, over 20,000 cycles/sec. Ultra-sonography has become a valuable diagnostic aid in obstetric and gynaecology, producing no ionizing radiation. Ultra-sonography, as it is safe and non-invasive has become the principle means for obtaining morphological information about intra uterine structures. With this procedure, the contents of the uterus as well as the internal structures of the placenta, fetus, fetal organs, and pelvic masses can be evaluated at any time during pregnancy.

Obstetric Ultrasound (Sonar)

Ultrasound is commonly used to image intra-abdominal organs. In obstetrics, the ultrasound examination of the fetus and placenta is an essential part of antenatal care.

The machine consists of a transducer, processing software and a screen. The transducer (or the probe) contains piezo-electric crystals and is placed on the abdomen. The crystals transmit pulsed high frequency, low intensity sound waves into the abdomen which are reflected at tissue interfaces. The reflected sound waves are also detected by the crystals and relayed to the processing software which converts them into shades of grey (depending on the intensity of the reflected sound waves)) and this produces a two dimensional image on the screen.

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By moving the transducer over the abdomen, successive two dimensional images are rapidly displayed allowing the ultra-sonographer to build up a real time moving picture.

Uses

Usefulness of ultrasound in obstetrics is a result of its ability to: visualize anatomical details, detect time dependent changes in structural organization and characterize the three dimensional geometry of intra-uterine structures.

Ultra-sonography is a valuable diagnostic aid in obstetrics and gynaecology, producing no ionizing radiation. Unlike X-ray there are no known harmful effects and therefore, it can be used to diagnose pregnancy in suspected cases of growth retardation.

Clinical Applications

Sonography has proved valuable for monitoring the products of conception in a variety of ways that include the following:-

1. Very early identification of intra uterine pregnancy
2. Demonstration of the size and the rate of growth of the amniotic sac, the embryo and at times resorption or expulsion of the embryo.
3. Identification of multiple fetuses including conjoined twins.

4. Measurement of the fetal head, abdominal circumference and femur, to help identify the growth retarded fetus.

5. Comparison of fetal head and chest or abdominal circumference to identify hydrocephaly, microencephaly or anencephaly.

6. Detection of fetal anomalies such as abnormal distentions of the fetal bladder, ascites, polycystic kidneys, diaphragmatic hernia, meningo myelocele or limb defects.

7. Demonstration of hydramnios or oligohydramnios, space surrounding the fetus.

8. Identification of the location, size and maturity of the placenta.

9. Demonstration of placental abnormalities.

10. Demonstration of uterine tumors or anomalies such as hydatidiform mole, molar degeneration and anomalies.

11. Detection of foreign body such as intra-uterine devices, blood clot, retained placental fragment.

Preparations

Upto 14 weeks, the uterus is low in the mothers pelvis and a full bladder acts as an acoustic window giving clear visualization of the uterus. Therefore, under 14 weeks of gestation a full bladder is required, so two pints of liquid should be given an hour before examination.

After 14 weeks, no preparation is required, the mothers clothes are adequately protected from coupling jelly. The mother should be able to see the screen during the scan.

Role of Ultrasonographer

It is important for the ultra-sonographer to bear in mind the following

Firstly, atmosphere in the ultrasound department should be relaxed and friendly; Secondly, ultra-sonographers should ensure that the parents contact with their fetus is as positive as possible; Thirdly, Partners and siblings accompanying the mother should be included in the explanations of the scan; Fourthly, demonstrating the fetus to mother and father increases fetomaternal bonding; and lastly, mothers who have seen their babies are more likely to come to the antenatal clinic, stop smoking, reduce alcohol intake, and listen to dietary advice.

Nurses' Responsibilities

- Explain the procedure to the patient to allay her anxiety.

- Shave the lower abdomen, if too hairy.

- Instruct the patient not to pass urine for at least 4 hours before the procedure so as to have full bladder.

- Put the patient in the spine position and the abdomen is exposed.

- Rub a thin layer of mineral oil over the abdomen to reduce friction and increase conductivity.

- The time should be explained to the patient as usually it takes twenty minutes.

- Maintain the privacy of the mother.

- Psychological support to the mother is of utmost importance, so the nurse should stay with the mother during the procedure.

The mothers' clothes should be adequately protected from coupling jelly.

- The mother should be able to see the screen during the scan.

Future

Unlike X-ray there are no known

harmful effects produced by ultrasound therefore it can be used early to diagnose pregnancy and repeated weekly or bi-weekly in suspected cases of growth retardation. Training can be given to radiographers, midwives and doctors. The ideal training should include theoretical and practical aspects of obstetric ultrasound with a recognised qualification.

Bibliography

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Early Pregnancy	Middle/Late Pregnancy	Puerperium
Early gestational sac	Fetal growth rate	retained products
Implantation site	Maturity	Cesarean section scars
Growth rate	Twins	Hematoma
Blighted ovum	Associated tumors	Associated tumors
Placental differentiations	Hydramnios	Urinary retention
Maturity	Placentography	Renograph
Early diagnosis of twins	Placental development	Puerperal pyrexia
Abortion - All varieties	Rh. placental changes	
Retained products	Cesarean section scar	
Hydatidiform mole	Renal complications	
Associated pelvic tumors		
Indication for Sonar investigation in Pregnancy		

Participate

in

Health

Communication

Competition.

Win

Prizes.