

Guidelines for performance of first trimester ultrasound examination

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Introduction

Obstetric ultrasound today is the mainstay of an obstetric examination. Just a couple of years back it was an investigation reserved for indicated pregnancies, but today most centres and experts feel that diagnostic ultrasound scan is a part of obstetric examination. This has led to a great advance in ultrasound technology, smaller portable machines and high resolution pictures: scanning today is technically easier, simpler and much more accurate. With the advent of Transvaginal probes a new vista for gynaecological and infertility diagnosis has opened up and is almost on the verge of replacing lapro-hysteroscopies. Contrast ultrasound and interventional procedures and colour doppler imaging has now given us an insight of the physiology and pathology of what is wrong where. This has further simplified diagnosis and understanding etiopathogenesis of early I.U.G.R., congenital anomalies and of course a host of tumours. Colour flow studies are also helping in a big way in evaluation and monitoring treatment response and prediction of A.R.T. pregnancies.

1. Obstetric ultrasound is not being routinely practised in India as it is neither practical nor possible nor essential to scan all pregnancies today.
2. Only pregnancies with definite indication should be scanned.
3. Till date no known side effects have been reported by the use of diagnostic ultrasound including colour and doppler imaging.
4. As the fetus is constantly in motion it may not be possible to detect all anomalies in one scan.

Level I

Documentation of Pregnancy, viability, recognizing multiple pregnancy, placental site and grading, Amniotic

fluid indexing. Basic biometric studies and fetal weight and major anomaly detection.

Level II

Detection of congenital anomalies, use of colour for I.U.G.R. studies.

Level III

Fetal Echocardiography.

These guidelines have been developed for use by practitioners performing obstetrical ultrasound studies. In some cases, additional and/or specialised examination may be necessary. While it is not possible to detect all structural congenital anomalies with diagnostic ultrasound, adherence to the following guidelines will maximize the possibility of detecting many fetal abnormalities. A limited examination is acceptable in clinical emergencies or if used as a specialized examination, such as a biophysical profile.

Equipment

These studies should be conducted with real-time scanner, using an abdominal and/or vaginal approach. A transducer of appropriate frequency (3 MHz or higher transabdominally, 5 MHz or higher transvaginally) should be used. The lowest possible ultrasonic exposure settings should be used to gain the necessary diagnostic information.

Real-time is necessary to confirm reliably the presence of fetal life through observation of cardiac activity, respiration, and active movement. Real-time studies simplify evaluation of fetal anatomy as well as the task of obtaining fetal measurements. The choice of frequency is a trade-off between beam penetration and resolution. With modern equipment, 3 to 5 MHz abdominal

transducers allow sufficient penetration in nearly all patients, while providing adequate resolution. During early pregnancy, a 5 MHz abdominal or a 5 to 7 MHz vaginal transducer may provide adequate penetration and produce superior resolution.

Documentation

Adequate documentation of the study is essential for high quality patient care. This should include a permanent record of the ultrasound images, incorporating whenever possible the measurement parameters and anatomical findings proposed in the following sections of this document. Images should be labelled with the examination date, patient identification, and, if appropriate, image orientation. A written report of the ultrasound findings should be included in the patient's medical record regardless of where the study is performed.

Guidelines for first trimester sonography

Scanning in the first trimester must be performed vaginally.

1. The location of the gestational sac should be documented. The embryo should be identified and the crown-rump length recorded.

The Crown-rump length is an accurate indicator of fetal age. Comparison should be made to standard tables. If the embryo is not identified, characteristics of the gestational sac including mean diameter of the anechoic space and analysis of the hyperechoic rim should be noted. During the late first trimester, biparietal diameter and other fetal measurements may also be used to establish gestational age.

2. Presence or absence of fetal life should be reported. Real-time observation is critical in this diagnosis. It should be noted that fetal cardiac activity may be visible at seven weeks abdominally and frequently at least one week earlier vaginally as determined by crown-rump length. Thus, confirmation of fetal life may require follow-up evaluation.

3. Fetal number should be documented.

Multiple pregnancies should be reported only in those instances where multiple embryos are seen. Due to variability in fusion between the amnion and chorion, the appearance of more than one sac-like structure in early pregnancy is often noted and may be confused with multiple gestation or amniotic band.

4. Evaluation of the uterus (including cervix) and adnexal structures should be performed. This will allow recognition of incidental findings of potential clinical significance. The presence, location, size of myomas and adnexal masses should be recorded.

Fetal Age (First Trimester)

1. Long axis of the uterus : lower uterine segment and cervix region
2. Long axis of the uterus : uterine body and fundus region
3. Transaxial: uterine lower body region
4. Transaxial: uterine body and fundus region
5. Long axis: gestational sac.
6. Long axis: gestational sac. Measure length and AP diameter.

Fetal Age (First Trimester)

1. Transaxial: gestational sac.
2. Transaxial: gestational sac. Measure width.
3. Long axis of embryo: If no embryo, document yolk sac if present.
4. Long axis of embryo: Measure crown-rump length.
5. Sagittal, right adnexa (demonstrating the right ovary)
6. Sagittal, left adnexa (demonstrating the left ovary).

Conclusion

For many years it has been discussed at various meetings and at FOGSI managing committee to develop guidelines and protocols. With the advancement of equipment and with the widespread use of ultrasound there is now an urgent need to have some written protocols and the step

taken by F.O.G.S.I. under Prof. R. Rajan's presidentship is indeed welcome and needed by our obstetricians and gynaecologists.

It should be noted that the ultimate responsibility for accuracy of diagnosis and documentation of findings remain with the individual practitioner and FOGSI nor the author is liable for procedures performed according to these protocols.

Each protocol is a set of minimum specification for a scan and each is based on a normal patient with no findings. It is the responsibility of the person performing the ultrasound scan to extend the basic protocol as needed to document all pathology detected. The protocols and guidelines are not rigid in sequencing of images. These are arbitrarily written for 6 images on a 8/10 film-other forms of archieving like printer, video & formats may be used by individuals. If followed in sequence it will

prevent ommission and contribute to efficiency during reading but it is not essential that images appear in the exact sequence specially in fetal studies, where we take what we get at a given moment. These protocols and guidelines aim as providing a checklist and standarised approach to documenting & study and may not be a concensus of all physicians as the final responsibility of a scan report lies with the sonographer or sonologist doing & reporting the scan.

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