Looking at early (less than eight weeks) pregnancy

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This clinic is designed to help you to see what the radiologist sees. It is not intended to be a comprehensive discussion of a given condition, but a guide to the radiological features. What do these images tell you?

Case presentation

The images in this clinic are from different patients. The patients had all had a positive pregnancy test.

Modality

The imaging modality used to detect an early pregnancy is ultrasound. Transabdominal scanning is usually carried out, with or without transvaginal scanning. To determine viability, the heartbeat must be seen, which is usually not visualised until approximately six weeks' gestation. Earlier than this, a small embryo can be seen, but the heartbeat may not be able to be imaged.

Preparation

For transabdominal scanning, the bladder needs to be full. The patient needs to consume a litre of water before the examination. If transvaginal scanning is to be performed, the bladder needs to be empty.

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What the terms mean

Echogenic
An area that appears white or whiter

Hypoechoic
Decreased echogenicity – the area appears black or blacker

Blastocyst
A structure containing both a cystic component and cellular component, which develops from fertilisation of the spermatozoa with the oocyte

Yolk sac
There are both primary and secondary yolk sacs. They are seen very early in pregnancy. They are separate from the developing embryo and amniotic cavity, developing from the blastocyst

Decidual reaction
The visualised decidua – the endometrium which covers the developing blastocyst. Part of it will eventually form the placenta

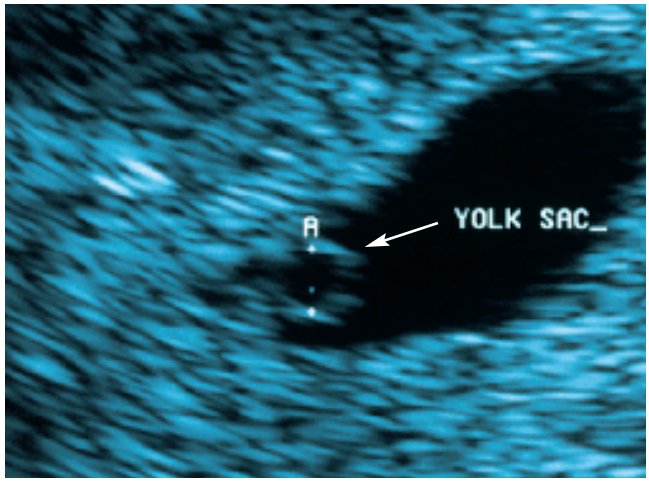

Figure 1. Ultrasound in early pregnancy. The large hypoechoic (black) area is the gestational sac. Within it, the smaller, rounded, hypoechoic area is the yok sac.

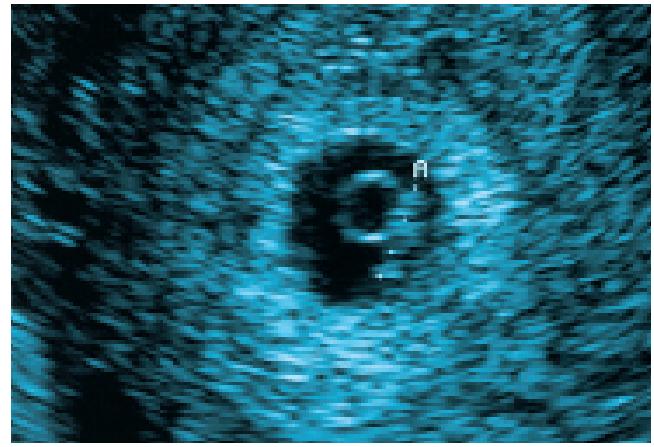

Figure 2 . The gestational sac, containing the yolk sac and a small linear echogenic area (indicated by calipers) that represents the developing embryo. You will also note around the gestational sac the echogenic area, which represents the decidual reaction.

continued

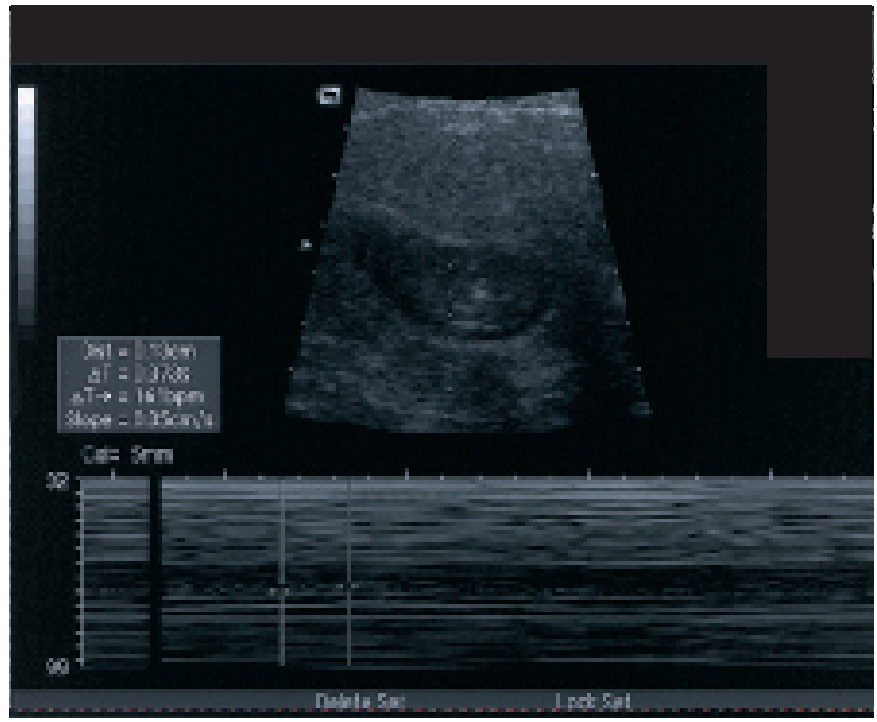

Figure 3. M-mode tracing. Among the many straight lines on the tracing, the calipers are placed on a line that is irregular; this line represents motion detected from the heartbeat. The positioning of the calipers then determines the heart rate.

Technique

Transabdominal and/or transvaginal scanning can be performed.

Transvaginal scanning allows the probe, and hence ultrasound beam, to be closer to the embryo; thus better definition can be achieved. Transvaginal scanning is usually used in two instances:

- when the embryo (and heartbeat) are not confidently identified with transabdominal scanning
- when the bladder is not filled and it is thought appropriate to scan transvaginally immediately rather than wait for the bladder to fill.

Please note that the patient's consent must always be obtained prior to transvaginal scanning.

To demonstate that the baby is living, an M-mode (motion mode) echocardiographic tracing is done. This records motion within the tissues and therefore confirms a heartbeat.

Radiological signs

- A small echogenic ovoid area represents the embryo.
- A hypoechoic rounded area, with a rounded rim, is the yolk sac.
- A large hypoechoic area is the gestational sac, containing the amniotic fluid.
- Surrounding the gestational sac is an echogenic rim, which represents the decidual reaction, as well as the developing placenta.
- M-mode tracing, with or without direct visualisation, records viability.

Key points

Ultrasound in the first trimester of pregnancy is important to confirm dates and viability and rule out complications. At this early age, many abnormalities cannot be detected, and abnormalities are best searched for with morphological scanning at 18 weeks. MT