

Placental Abruption detected on CT – A case report

Sze Mun Mak, SpR Radiology

Richard Henderson, Consultant Radiologist

Darlington Memorial Hospital and James Cook University Hospital

makszemun@doctors.org.uk

Abstract

Placental abruption is the premature separation of the placenta from the uterus. It can be spontaneous or caused by trauma. There are obvious consequences for both the mother and fetus. We report an uncommon case of post traumatic placental abruption where the pregnant uterus was scanned by CT before a confirmed miscarriage.

Introduction

Placental abruption (Abruptio placentae) is defined as premature separation of a normally implanted placenta from the uterus after 20 week gestation. Symptoms include vaginal bleeding, lower abdominal pain and tenderness, shock and disseminated intravascular coagulation. Separation causes bleeding retroplacentally¹. There are no published images of the CT appearances of the normal gravid uterus as a normal pregnancy would never be scanned due to the radiation dose.

Case Report

A 24 year old woman who was 21 weeks pregnant was the driver of a car involved in a collision. She had to be extracted from the car after it had rolled over.

She was managed initially in the Emergency Department. There was a mild tachycardia of 118, but her blood pressure was stable. Bedside ultrasound by the obstetrics team showed no fetal heartbeat.

CT of the thorax, abdomen and pelvis showed fractures of the left scapula and left 3rd and 10th ribs. She also suffered bilateral haemothoraces and pulmonary contusions. There was free fluid around the liver with fairly extensive haematomas in the right kidney and spleen. The gravid uterus was noted to be intact at that time (Figure 1). There were fractures through the right superior and inferior pubic rami.

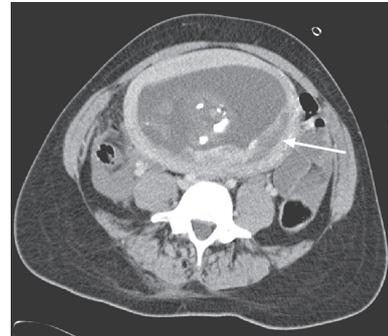


Fig 1. Post contrast CT of the lower abdomen showing the gravid uterus with placental abruption.

It was felt that she was overall stable haemodynamically, and admitted to ITU for close observation.

At 3 am in the morning, the Obstetric registrar was called to review the patient. She was mobile, and had no active bleeding. However, there were palpable contractions, and a difficult PV examination revealed a non-dilated cervix. At this point the registrar was happy that the patient was stable, and opted to manage her conservatively. An hour later, the patient went into labour and spontaneous expulsion of the fetus followed – it was stillborn with no signs of life. The mother recovered well afterwards, and was discharged.

Discussion

Placental abruption affects roughly 1% of all pregnancies. The maternal effect depends on its severity, whereas the fetal effect is dependent both on its severity and gestational age. Diagnosis is mainly clinical. Abruption of more than 50% of the placenta is almost always associated with fetal death. When this occurs, vaginal delivery is preferable, as in our patient. Prompt caesarean section is indicated if there is maternal compromise².

Following trauma, evaluation of the gravid uterus is essential. Fetal distress and death are more common with injuries involving the uterus.

CT is the first line of trauma investigation as it is superior to MRI for assessment of fractures. Also, MRI may not be immediately available in an acute situation. CT is more usually rapidly and widely available. It is also more sensitive in the diagnosis of certain organ injuries e.g. the pancreas³ and can be completed in a matter of minutes. Ultrasound can detect fetal distress and determine fetal position, but it has poor sensitivity for detection of abruption. A normal ultrasound does not exclude a placental or uterine injury, or extra-uterine injuries⁴. Placental abruptions are often overlooked on CT as it is difficult to define normality for a pregnant uterus, as they are not performed except in extreme situations like trauma.

Accidental injury happens to 7% of pregnant patients, with road traffic accidents being the most common cause. 0.3-0.4% of traumatized pregnant patients are admitted to hospital, and about a quarter of them will not survive. A major cause of death is head trauma; however abdominal trauma is a concern for both maternal and fetal survival. CT will not demonstrate fetal injury itself unless gross, but will show uterine rupture, placental abruption or ischemia³.

CT has an overall accuracy of 96% in detecting placental abruption⁵. The normal gravid uterus and physiological changes can make CT interpretation difficult. Counfounding factors include subchorionic haemorrhage, venous lakes, wedge-shaped infarcts and myometrial contractions⁶.

CT of the abdomen and pelvis in pregnancy has been limited, due to concerns for teratogenicity and childhood cancers caused by radiation. The threshold dose for deterministic (non-cancer) effects reportedly ranges between 100 – 200 mGy. The effects are most severe with pregnancies of 2-15 weeks⁴. The major risks to the fetus in the first trimester are neurologic and carcinogenic. Under 100 mGy, one would not expect significant neurologic impairment⁷.

A pelvic CT delivers about 20-80 mGy of absorbed doses to the fetus⁸. As for stochastic (i.e. random) effects, for a 50mGy pelvic CT, the risk of inducing cancer in the fetus is less than 1%⁹.

Teaching Point

Even in a pregnant patient regardless of gestation, CT of the pelvis is pivotal in trauma for the early diagnosis of severe injuries. Fetal death can occur even with minimal trauma. There are many normal physiological features that can mimic placental abruption. It is important for the radiologist to keep this elusive diagnosis in mind when evaluating the gravid uterus post trauma.

References

1. The MERCK manuals Online Medical Library.
2. Oyelese Y, Ananth YC. *Obstet Gynecol* 2006 Oct 108(4):1005-16
3. Goldman, Wagner Radiologic ABCs of Maternal and Fetal Survival after Trauma: When Minutes May Count. *Radiographics* 1999;19:1349-1357
4. Lowdermilk C, Gavant ML, Qaisi W et al (1999) Screening helical CT for evaluation of blunt traumatic injury in the pregnant patient. *Radiographics* 19(Spec No):243–255, discussion S256-248
5. Manriquez M, Srinivas G, Bollepalli S, et al. Is computed tomography a reliable diagnostic modality in detecting placental injuries in the setting of acute trauma? *Am J Obstet Gynecol* 2010;202:611.e1-5.
6. Wei, Sindy H., Helmy, Mohammad, & Cohen, Allen J.(2009). CT evaluation of placental abruption in pregnant trauma patients. *Emergency Radiology*, 16(5), pp 365-373.
7. Hurwitz et al. Radiation Dose to the Fetus from Body MDCT During Early Gestation. *AJR* 2006; 186:871-876
8. Kusama et al. Radiological protection for diagnostic examination of pregnant women. *Congenital anomalies*. Volume 42 Issue 1.Pages 10-14.
9. Committee on the Biological Effects of Ionizing Radiations. The effects on populations to exposure to low levels of ionizing radiations:1980. Washington, DC: National Academy Press