

# Case report of an Interstitial ectopic pregnancy

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## Background

An ectopic pregnancy results when a fertilised ovum implants outside the uterine cavity. 1% of all pregnancy's in the United Kingdom are ectopic (1). An ectopic pregnancy can clinical present in a typical or atypical manner, therefore any issues a patient has in early pregnancy should not be dismissed. Common presentations in a patient with an ectopic pregnancy can include: abdominal or pelvic pain and/or vaginal bleeding (2). An ectopic pregnancy can be a life-threatening event for the patient if left untreated and is responsible for 2.7% of all pregnancy related deaths (3). Timely diagnosis is essential to successful management of an ectopic pregnancy; early diagnosis reduces the risk of an ectopic pregnancy rupturing and therefore of maternal mortality (4). 96% of all ectopic pregnancies will be located in the fallopian tube. Rarely, 3-5% of all ectopic pregnancies may present in other locations such as: abdominal, cervical, interstitial or ovarian.

An interstitial ectopic pregnancy (IP) occurs when the fertilised ovum implants in the proximal portion of the fallopian tube which is located within the myometrium. Historically IP were diagnosed during laparotomy after the pregnancy had ruptured (4). IP can cause catastrophic haemorrhage due to the vascularity within this region (5). There are numerous risk factors for IP including: Previous ectopic pregnancy, tubal surgery, in vitro fertilisation or history of a sexually transmitted disease (6).

**On USS there are several classical signs of an IP including (7):**

**Empty uterine cavity**

**Gestation sac identified separately from the lateral edge of the uterine cavity**

**A thin <5mm myometrium layer surrounding the gestation sac**

**Presence of an interstitial line sign or extension of endometrium to the gestation sac edge**

Transvaginal ultrasound (TVUS) scanning is a good method to use to early pregnancy due to the increased image quality compared to transabdominal scanning as the transducer is position closer to the area of interest then a higher Ultrasound frequency can be used. The Ultrasound features of an IP combined with the patient's clinical presentation and serum human chorionic gonadotrophin levels (hCG) should all be used as diagnostic tools to manage the patient. One study established that TVUS has a sensitivity rate of 56% to diagnoses an IP at 8.2 weeks gestation (8); whereas another study has demonstrated a higher sensitivity rate of 71.4% at 6.9 weeks gestation (6).

## Case report

The 37 year old pregnant female patient was referred to the early pregnancy assessment unit (EPAU), she had a recent positive pregnancy test and present with vaginal bleeding and a dull ache radiating to her back. By her last menstrual period date she was estimated to be approximately 5 weeks pregnant. On examination her abdomen was soft, non-tender and her os was closed. The hCG levels were 1080.

An ultrasound examination was organised to further evaluate. On the ultrasound scan the endometrium was of normal thickness measuring 4mm (**image 1**), there was no evidence of an intrauterine or ectopic pregnancy (**image 2**). Both ovaries were demonstrated with no adnexal masses or free fluid. With the lack of intrauterine pregnancy seen on USS and the high positive HCG levels the patient had a diagnostic laparoscopy to assess for any sign of an ectopic pregnancy. Surgically the uterus was normal in shape and size and there was no evidence of an ectopic pregnancy within the pelvis.

The patient re-presented 4 weeks later as her pregnancy test remained positive. On the scan the endometrium was again of normal thickness measuring 4mm, however at the right lateral boarder of the uterus a live pregnancy could be seen. A TVUS examination was undertaken to further evaluate this. On TVUS there was a thin layer of myometrium seen surrounding the live pregnancy (**image 3**), in keeping with an IP. A crown rump length was obtained and the fetus measured 23.3mm, equivalent to 9 weeks gestation (**image 4**).

Image 1. TVUS Longitudinal section demonstrating a thin endometrium with no sign of an intrauterine pregnancy

Image 1



Image 2. TVUS transverse section (TS), no evidence of an intrauterine or ectopic pregnancy

Image 2

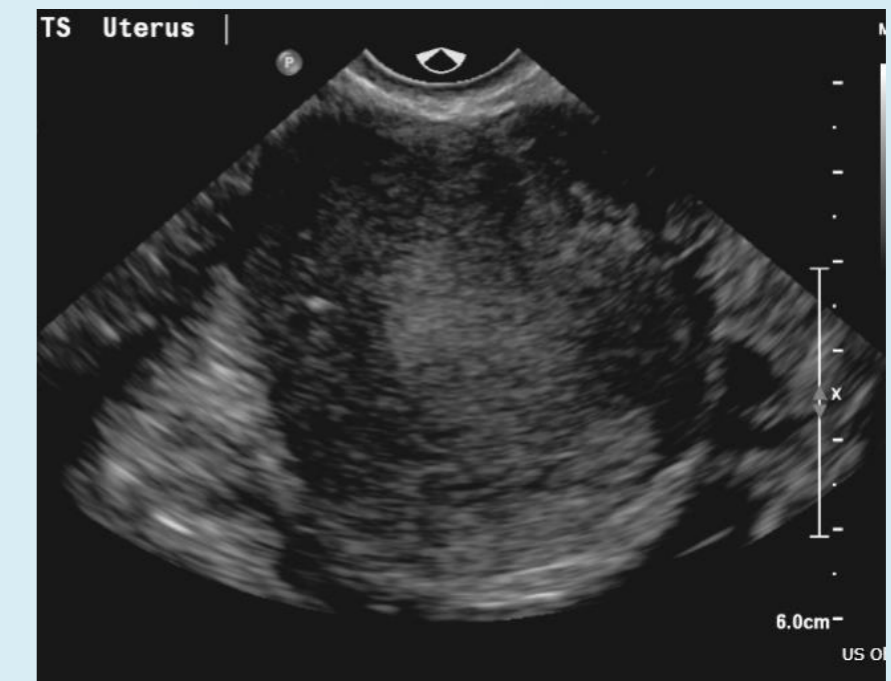


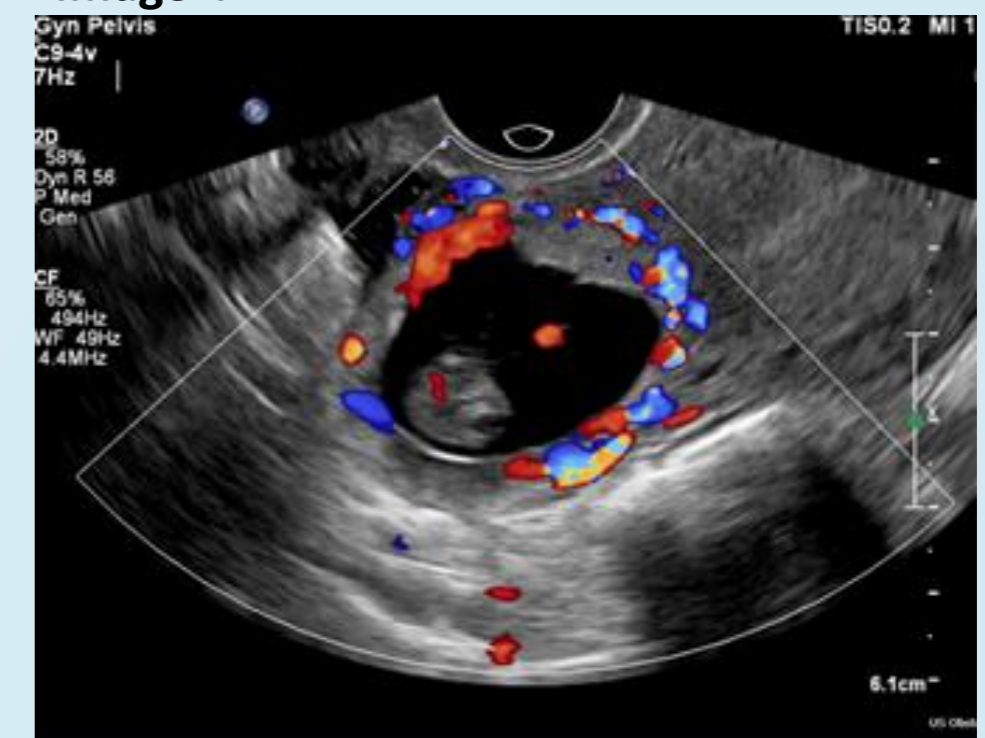
Image 3. TVUS TS demonstrating a thin layer of myometrium around the gestation sac

Image 3



Image 4. TVIS TS, colour Doppler showing a live IP, no adnexal free fluid

Image 4



## Discussion

IP are very rare forms of ectopic pregnancy making the diagnosis challenging. There are several risk factors for IP including -previous ectopic pregnancy, tubal surgery, in vitro fertilisation or history of a sexually transmitted disease (6). However, in this case there were no associated risk factors.

Early diagnosis is essential for safe management of the patient and ultrasound scanning is an important part of patient diagnosis. IP can be misdiagnosed as a viable intrauterine pregnancy due to the close proximity to the uterus (7). Having highly trained ultrasound practitioners scanning the patient will help reduce that chance. In this case the Sonographer was the same practitioner for each scan attendance removing any operator bias.

Using three-dimensional Transvaginal Ultrasound (3DTV) scanning can improve diagnosis due to the increased quality of spatial resolution compared to b-mode TVUS scanning which can help visualise the position of the pregnancy (9). However, in this case, in the first scan there was no sign of a pregnancy either transabdominal or transvaginal method, therefore at this stage using 3DTV would not have changed the clinical diagnosis.

In this case study there were several identifiable points to diagnose this was an IP on the second scan including: an empty uterine cavity, a gestation sac identified separately from the lateral edge of the uterine cavity and a thin <5mm myometrium layer surrounding the gestation sac (7). The only diagnostic point not seen was the presence of an interstitial line sign or extension of endometrium to the gestation sac edge (7). If 3DTV had been used in this case it may have helped demonstrate the hyperechoic thin line to the cornual area (10), However, this would not have added to the diagnosis in this case as the other the clinical features clearly demonstrated an IP on B-mode TVUS.

## Conclusion

The diagnosis of IP is challenging, mainly due to the rarity of cases. The high sensitivity of USS makes it the best first line investigation to diagnose IP. Due to the rarity of IP it is important that USS is undertaken by sufficiently qualified and experienced Sonographers. The use of 3DTV may aid diagnosis as the improved spatial resolution can assist in demonstrating the interstitial line sign, however in this case it would not have added to the clinical diagnosis.