

# Early abdominal pregnancy with an unexpected and misleading location. The ultrasonographic interpretation

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## Summary

Abdominal pregnancy is a rare condition defined as an ectopic pregnancy that implants in the peritoneal cavity and is associated with important morbidity and mortality. We report a case of a 35-year-old woman with an ultrasonographic diagnosis of a left extrauterine pregnancy located proximally in the isthmus or distally in the interstitial region. In the exploratory laparotomy a gestational sac implanted anteriorly on the uterine serosa was found, with no signs of uterine perforation or tubal abortion. The pathologic examination confirmed the diagnosis of an early first trimester abdominal pregnancy. This case illustrates the importance of an early sonography in the diagnosis of an abdominal pregnancy as well as a high index of suspicion.

**Key words:** Primary abdominal pregnancy; Hemoperitoneum; Early ultrasound.

## Introduction

Abdominal pregnancy is a rare condition defined as an ectopic pregnancy that implants in the peritoneal cavity either primarily or secondarily. It is associated with important morbidity and mortality and the estimated incidence is one in 10,000 in the USA [1], representing 1.4% of all ectopic pregnancy cases [2, 3]. The risk factors studied are the same as for ectopic pregnancies in general, therefore assisted reproductive technology (ART) increases the risk of an abdominal pregnancy [2, 4-6].

Many cases have been described in the literature and the implantation sites reported include the omentum, pelvic side wall, broad ligament, cul-de-sac and abdominal organs (spleen, bowel, liver), large pelvic vessels, diaphragm and the uterine serosa [3-5, 7-9]. Various hypotheses have been proposed to explain this rare phenomenon, the most probable being secondary implantation from an aborted tubal pregnancy. Primary implantation, i.e., intraabdominal fertilization of sperm and ovum, is an extremely rare event according to the literature [10]. In the context of infertility, there are reports of different mechanisms to explain the pathogenesis of an abdominal pregnancy, including uterine perforation by the embryo transfer catheter, migration of an embryo through a microscopic fistulous tract in the interstitial portion of the tube and subsequent implantation in the abdominal cavity, and migration of an oocyte to the abdominal cavity where it is fertilized by spermatozoa entering through a cornual fistulous tract (after follicular aspiration) [2].

The diagnosis of an early abdominal pregnancy may be a difficult challenge. A high index of suspicion is

required due to the non specificity of clinical history, physical examination, as well as laboratory and ultrasonographic findings. The clinical manifestations are frequently non specific and vague, depending on the pregnancy location and gestational age.

Ultrasound (US) examination is the gold standard diagnostic tool. However, according to Costa and associates, a sonographic diagnosis of abdominal pregnancy is missed in half the cases [11]. In the particular case of an early pregnancy, it may be difficult to distinguish an abdominal from a tubal pregnancy if it implants near the adnexa [4].

## Case Report

A 35-year-old woman, nulipara, was referred to our infertility unit in July 2009, due to a history of primary infertility of two years duration, with a diagnosis of ovarian endometriosis. The patient had been previously examined in another hospital, where she was submitted to an exploratory laparoscopy in March 2009. During this intervention an endometrioma of the left ovary was removed and many implants of endometriosis on the uterosacral ligaments and peritoneum were detected and electrocoagulated. The patency of both fallopian tubes was demonstrated and subsequently the pathologic examination confirmed the diagnosis of endometrioma.

In our institution, we studied the male factor as a possible infertility cause, and found an astenoteratozoospermia. The patient study did not reveal additional pathology and she was waiting for an *in vitro* fertilization cycle.

In October 2009, the woman was admitted to our emergency room, complaining of intense abdominal pain, predominantly in the pelvic region, accompanied by an episode of loss of consciousness. Vital signs were normal and physical examination revealed a distended abdomen and diffuse tenderness in the lower quadrants, although with no rebound tenderness. Transvaginal ultrasound scan showed a thick endometrium and an empty uterus with no evidence of a gestational sac. A small amount of free fluid was noted in the pelvis and the ovaries both

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Fig. 1



Fig. 2



Fig. 3



Fig. 4

Figure 1. — Embryo cardiac activity – heart rate (HR) = 122 BPM.

Figure 2. — Yolk sac (2.9 mm).

Figure 3. — Gestational sac (GS) location. Legend: 1) GS; 2) Uterus (cornual region); 3) Fallopian tube (isthmus).

Figure 4. — Gestational sac location. Legend: GS – Gestational sac.

had augmented size – the left one due to a corpora lutea and the right one owing to an apparently multiseptated cyst. Blood and urine analyses were requested and indicated the existence of a possible pregnancy, with a beta HCG level of 7,271 mUI/ml and progesterone level of 7.8 ng/ml. The hemoglobin was 10.5 g/dl.

We decided to repeat the US scan a few hours after admission. This was performed in our ultrasonography unit in order to obtain a more detailed and precise exam. The transvaginal scan (Figures 1-4) confirmed the previous findings and additionally noted an anechoic image in the left adnexa, just close to the uterus, 24 × 23 mm in diameter, surrounded by an echoic hale. In its interior, we found an embryo with cardiac activity and a crown-rump length (CRL) of 9 mm. Free echoic fluid in the pelvis was estimated as 150 ml. Therefore, the US findings were compatible with a left extrauterine pregnancy located proximally in the isthmus or distally in the cornual region.

Blood analyses were repeated and showed a decrease in the hemoglobin level to 9.4 g/dl, normal platelet count and normal coagulation tests. Anemia was corrected by a transfusion of one unit of red blood cells.

After evaluating the Fernandez score [12] the patient under-

Table 1. — Fernandez Score [12].

		Score
Weeks of amenorrhea	7 weeks + 1 day	2
βhCG (mUI/ml)	7271	3
Progesterone (ng/ml)	7.8	2
Abdominal pain	spontaneous	3
Hematosalpinx diameter	24 x 23 mm	2
Hemoperitoneum volume	150 ml	3

went surgery (Table 1). Exploratory laparotomy showed moderate intraabdominal bleeding (hemoperitoneum) and a gestational sac implanted anteriorly on the uterine serosa, between the left uterine cornu and the origin of the left round ligament. After removing the ruptured gestational sac, the implantation site, which showed no signs of uterine perforation or tubal abortion, was electrocoagulated and the hemorrhage ceased. The uterus and both ovaries and tubes were carefully inspected. They appeared normal and no signs of uterine perforation or bleeding from either fimbriae were observed. A transfusion of

one unit of erythrocyte concentrate was made intraoperatively. The right ovary had two cysts – one simple and the other hemorrhagic – which were removed. The pathologic examination confirmed the diagnosis of a first trimester abdominal pregnancy. The postoperative course was uneventful and the patient was discharged on the fourth postoperative day. Hemoglobin at the discharge was 10.4 g/dl and beta  $\beta$ hCG was 480.10 mUI/ml. Posterior clinical evolution was favorable, without interurrences, and 17 days postoperative the beta  $\beta$ hCG was almost negative (14 mUI/ml). The patient was therefore referred to the infertility unit.

## Discussion

Abdominal pregnancy is a rare event, having an incidence of one in 10,000 pregnancies in developed countries. It occurs either as a result of tubal abortion or rupture (secondary abdominal pregnancy) or, more rarely, as a direct implantation on the peritoneum, with normal fallopian tubes, normal ovaries, and no tubal fistula (primary abdominal pregnancy) [13]. Since maternal morbidity and mortality is very high, the diagnosis of this condition in early gestation is extremely important to avoid massive hemorrhage [14].

Diagnosis of an abdominal pregnancy is a difficult challenge and only 40% of cases are correctly identified before surgery. A high index of suspicion is required and knowledge of abdominal pregnancy risk factors, the same as those for ectopic pregnancy, is essential. Initial clinical findings are also the same as those of ectopic pregnancy, the most frequent ones being abdominal pain and vaginal bleeding.

Early transvaginal US is valuable in diagnosing abnormalities such as anembryonic gestation, viable intrauterine or extrauterine gestation, and it is currently the imaging method of choice [15]. In this particular case, it is essential to notice the rare and misleading location, since it was this feature that led us to consider the hypothesis of the US diagnosis of a left extrauterine pregnancy located proximally in the isthmus or distally in the cornual region. US is the only available non invasive method which can detect a peritoneal pregnancy, although the differential diagnosis with tubal pregnancy has yet been unsatisfactory [16].

Laparotomy has been the treatment of choice in abdominal pregnancy with concurrent intraabdominal hemorrhage. The development of efficient laparoscopic instrumentation and accumulating experience and skills of laparoscopic surgeons have led to recent reports of successful management of abdominal pregnancy by laparoscopy. However, successful treatment of this condition associated with severe hemoperitoneum has rarely been reported [17]. In our case report, the patient was hemodynamically unstable, which led to the option of performing a laparotomy. Nevertheless, laparoscopy must be considered today as the gold standard treatment for early abdominal pregnancy, even with concurrent intraabdominal bleeding [18].

In conclusion, although abdominal pregnancy is a rare event, awareness of this condition is very important in reducing the associated morbidity and mortality.

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