



# Emergency laparoscopic splenectomy for haemoperitoneum because of ruptured primary splenic pregnancy: a case report and review of literature

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## Key words

abdominal pregnancy, ectopic pregnancy, laparoscopy, surgery.

## Abbreviations

β-hCG, β-human chorionic gonadotropin.

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## Abstract

**Background:** Primary abdominal pregnancies are potentially life-threatening, particularly without an accurate preoperative diagnosis.

**Case:** A 41-year-old woman presented to the emergency room with 2 days-lasting left upper quadrant abdominal pain, irradiated to the left shoulder. An urine β-human chorionic gonadotropin test was positive. Transvaginal sonography raised a suspicion of ectopic pregnancy. The patient was then submitted to abdominal laparoscopy that revealed no sign of active bleeding or ectopic pregnancy. Because of worsening of abdominal pain and progressive anaemia, the patient underwent abdominal ultrasound and multislice computerized tomography scan (TC) that showed the presence of a mass at the superior splenic pole with haemoperitoneum. The patient was taken to the operating room and submitted to a laparoscopic total splenectomy. The post-operative course was uneventful, and the patient was discharged 8 days after intervention.

**Conclusion:** Abdominal pregnancy should be considered in the differential diagnosis of acute abdomen in women of reproductive age. Abdominal ultrasound and computerized tomography studies must be performed before operative treatment if an ectopic pregnancy is suspected and no intrauterine gestational sac could be showed on transvaginal sonography.

## Introduction

In about 20 per 1000 cases in pregnancies, the site of implantation is different from the uterine cavity (ectopic pregnancies): The most common site of ectopic implantation is the fallopian tube (95.5%).

Although rare (1.3% of ectopic pregnancies), an ovum could implant within the peritoneal cavity (abdominal pregnancies) either directly (primary abdominal pregnancies – extremely rare) or because of tubal rupture (secondary abdominal pregnancies).

The criteria for primary abdominal pregnancy have been described by Studdiford in 1942:

- Normal fallopian tubes and ovaries
- No evidence of uteroplacental fistula
- Pregnancy is related exclusively to the peritoneal surface and early enough to eliminate the possibility of secondary implantation after primary nidation of the fallopian tubes.

Abdominal pregnancies are potentially life-threatening, particularly without an accurate preoperative diagnosis, and account for a mater-

nal mortality rate about 5.1 per 1000 cases (7.7 times higher than other ectopic pregnancies and 90 times higher with respect to normal uterine pregnancies).

Risk factors related to abdominal pregnancies are similar to those of other ectopic pregnancies, that is, prior history of pelvic inflammatory disease, prior ectopic gestation, endometriosis, reproductive assistance, uterotubal malformation and previous tubal surgery.

Although the most common site for primary peritoneal implantation are the pouch of Douglas and the posterior uterine wall, previous reports have described such pregnancies in the uterosacral ligaments, the omentum, lesser sac, small and large intestines, liver and spleen.

The liver and the spleen are more favourable for implantation because they are flat organs, rich in blood flow and easily reached by the fertilized ovum.<sup>1</sup> However, both cannot allow placental attachment, thus leading to rupture with massive haemoperitoneum, if the pregnancy is left untreated.<sup>2</sup>

Splenic pregnancies tend to present earlier than other abdominal pregnancies, presenting with haemoperitoneum occurring at 6–8 weeks gestation, when the size of splenic gestation exceeds 2–3.5 cm in average.<sup>3</sup>

## Case

A 41-year-old woman, gravida 3, spontaneous aborta 1, presented to the emergency room with 2 days-lasting left upper quadrant abdominal pain, irradiated to the left shoulder with deep inspiration. The patient had a history of regular menses, and, at the time of admission, she was expecting her menstrual period. An urine  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) test was positive. Physical examination was negative, in particular, revealed no abdominal tenderness or rigidity: Abdominal pain was present only at deep palpation on left upper quadrant. The gynaecological examination showed a normal cervix and no uterus or adnexa tenderness; Douglas' pouch digital examination evoked acute pain.

Transvaginal sonography revealed a normal-size uterus with a thickened endometrium without identifiable gestational sac; at the level of the left tube, an image suspected for ectopic pregnancy was detected, together with a discrete amount of fluid (1.97 in.) in the pouch of Douglas.

Quantitative assay of  $\beta$ -hCG was 8.980 U/L.

The patient was then admitted to the department of obstetric and gynaecology in our hospital and submitted to abdominal laparoscopy that showed, after aspiration of a discrete pelvic blood collection (350 cc), normal uterus and adnexa with no sign of active bleeding or ectopic pregnancy; the right ovary was normal and a corpus luteum was removed from the left ovary.

Uterine dilatation and curettage was performed, but the subsequent histopathological examination did not reveal any evidence of chorionic villi or trophoblasts.

Because of worsening of abdominal pain and progressive anaemia (up to haemoglobin 8.5 mg/dL), the patient underwent abdominal ultrasound examination that revealed a solid formation, 23 × 17 mm in dimension, with mixed echogenicity, localized at the superior splenic pole in a subcapsular position (Fig. 1).

A multislice contrast-enhanced TC examination was then performed. It confirmed the presence of a well-defined heterogeneous hypervascular mass at the superior splenic pole, protruding from the normal splenic contour, with a consistent amount of fluid within the peritoneal cavity (Fig. 2).

The patient was admitted to the department of surgery in our hospital and was taken to the operating room.

A laparoscopic intervention was decided and pneumoperitoneum was made with open technique; three 10-cm trocars were used, disposed under the costal arch (on anterior, medium and posterior axillary line); the patient was posed supine with 30° right side rotation.

About 800 mL of blood and blood clots were found in the abdominal cavity; the spleen was actively bleeding through a capsular dissection on the superior pole (Fig. 3).

A laparoscopic total splenectomy was performed.



**Fig. 1.** Abdominal ultrasound (US), mass at the superior splenic pole.

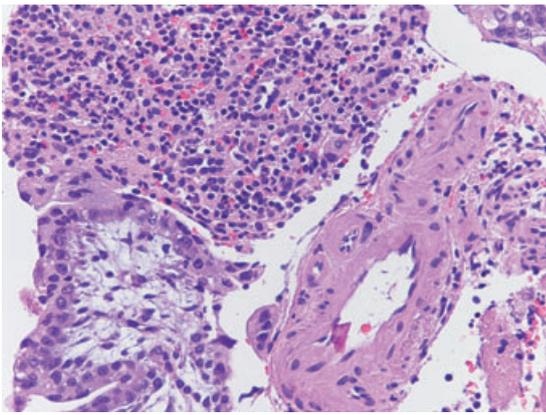


**Fig. 2.** Computerized tomography scan, heterogeneous hypervascular mass at the superior splenic pole.

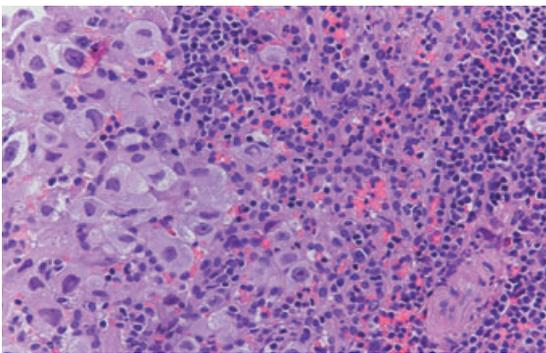


**Fig. 3.** Laparoscopic view, haemorrhagic lesion at the superior splenic pole.

Splenic dissection was conducted using electrocoagulation and harmonic scalpel. Polar vessels were ligated using standard 5-mm titanium clips, while splenic hilum was sectioned with a linear stapler. The spleen was then inserted on an endobag and removed through the optical site, after fragmentation.



**Fig. 4.** Histopathological examination (20x): chorionic villi within the splenic tissue.



**Fig. 5.** Histopathological examination (40x): trophoblastic tissue infiltrating the splenic tissue.

The intervention was 1 h long, and there was no need for blood transfusions in the theatre.

The post-operative course was uneventful; the patient was vaccinated against meningococci, pneumococci and Haemophilus influenzae, and was discharged 8 days after intervention; no blood transfusions were performed during hospital stay.

Histopathological examination revealed blood clots with chorionic villi and trophoblastic tissue within the splenic tissue, which was consistent with a splenic ectopic pregnancy (Figs 4,5).

The  $\beta$ -hCG quantitative assay decreased to 930 UI/L in post-operative day 4.

## Comment

The case described, in which a laparoscopy made by gynaecologists showed normal tubes, ovaries and uterus, is well classified as primary splenic pregnancy.

To our knowledge, there are 13 case reports in the literature (ours included) of primary splenic pregnancies. The patients have a mean age of 29.7 years (range 24–41 years), and most presented with sudden or short-lasting abdominal pain, radiating to the left shoulder.

Most of the gestations were subcapsular in location and assumed the appearance of an irregular mass that exceeds the contour of the spleen.

Nearly all patients had preoperative diagnosis of ruptured ectopic pregnancy.

One case consisted on simultaneous tubal–splenic pregnancy after assisted reproductive technology.

This case, similarly to the other reported by Yagil *et al.*,<sup>4</sup> is interesting because transvaginal sonography, curettage and laparoscopy were not diagnostic. A raising blood level of  $\beta$ -hCG, suggesting the presence of ectopic pregnancy, was confirmed afterwards by abdominal ultrasound and computerized tomography scan.

Abdominal pregnancy is rare but has high maternal mortality rates: Preventing abdominal pregnancy-related deaths depend, in part, on increasing awareness of its clinical characteristics; abdominal pregnancy should be considered in the differential diagnosis of acute abdomen in women of reproductive age.<sup>2</sup>

In a patient complaining about abdominal symptoms (especially upper abdominal symptoms), the absence of an intrauterine gestational sac on transvaginal sonography, aside from a high level of  $\beta$ -hCG (>1500 U/L), is suggestive of an ectopic pregnancy, and the patients should be submitted to abdominal ultrasound and computerized tomography studies before operative treatment.<sup>4</sup>

Agreeing with Yagil *et al.*,<sup>4</sup> the appearance of an irregular mass outside the contour of abdominal viscus should raise the suspicion of ectopic abdominal pregnancy.

Laparoscopy should be performed for diagnosis and possible treatment: The entire abdominal cavity must be evaluated, and removal of ectopic pregnancy could be attempted, especially in case of timely diagnosis.

Although successful emergency laparoscopic treatment of abdominal pregnancy associated with extensive haemoperitoneum has rarely been reported, our report, aside from the case reported recently by Yagil *et al.*,<sup>4</sup> shows that haemoperitoneum in abdominal pregnancy may be treated with laparoscopy and that conversion to laparotomy may not be necessary, at least in the case of splenic pregnancy.

So, ectopic pregnancy removal must be attempted primarily in laparoscopy, even in case of extensive bleeding or haemoperitoneum; laparotomy, however, should be reserved to laparoscopic failure.

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