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Case Report

Rectus sheath hematoma in pregnancy: a case report☆,☆☆

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ABSTRACT

This clinical study reports a case of rectus sheath hematoma in a 32-year-old woman with a pregnancy at 33 weeks of gestation, who developed acute right-sided abdominal pain following anticoagulant administration for pulmonary embolism. The rectus sheath hematoma was identified during an emergency cesarean section initiated due to severe fetal bradycardia. The present case would have been easy to manage prenatally if the presence of rectus sheath hematoma had been added as a differential diagnosis. For future cases, timely recognition and therapy could help prevent premature cesarean delivery.

Introduction

Rectus sheath hematoma (RSH) is an uncommon clinical entity that results from bleeding into the rectus sheath. This bleeding can be caused by damage to the superior or inferior epigastric arteries or their branches or by a tear of the rectus muscle [1,2]. With an aging population and frequent use of anticoagulants, this historically benign pathology has become more prevalent and serious [3]. Because RSH is characterized by gradual to acute abdominal pain, it can easily be mistaken for other intra-abdominal disorders and may pose diagnostic and therapeutic dilemmas at clinical examination [4]. Abdominal pain associated with RSH can be more severe in pregnancy since the uterus presses on the abdominal muscles. Most significantly, given the impact the formation of a massive hematoma has on maternal blood circulation, RSH may lead to acute placental-fetal hypoperfusion. According to Khan et al [5] and literature discussed in that paper, RSH can contain up to 2 L of clot and blood. This amount is sufficient to affect the hemodynamics of the fetus. The reduction in maternal blood circulation as a result of RSH formation markedly reduces fetal blood circulation, which leads to hypoperfusion. A proper and timely diagnosis of RSH is, therefore, critical to prevent

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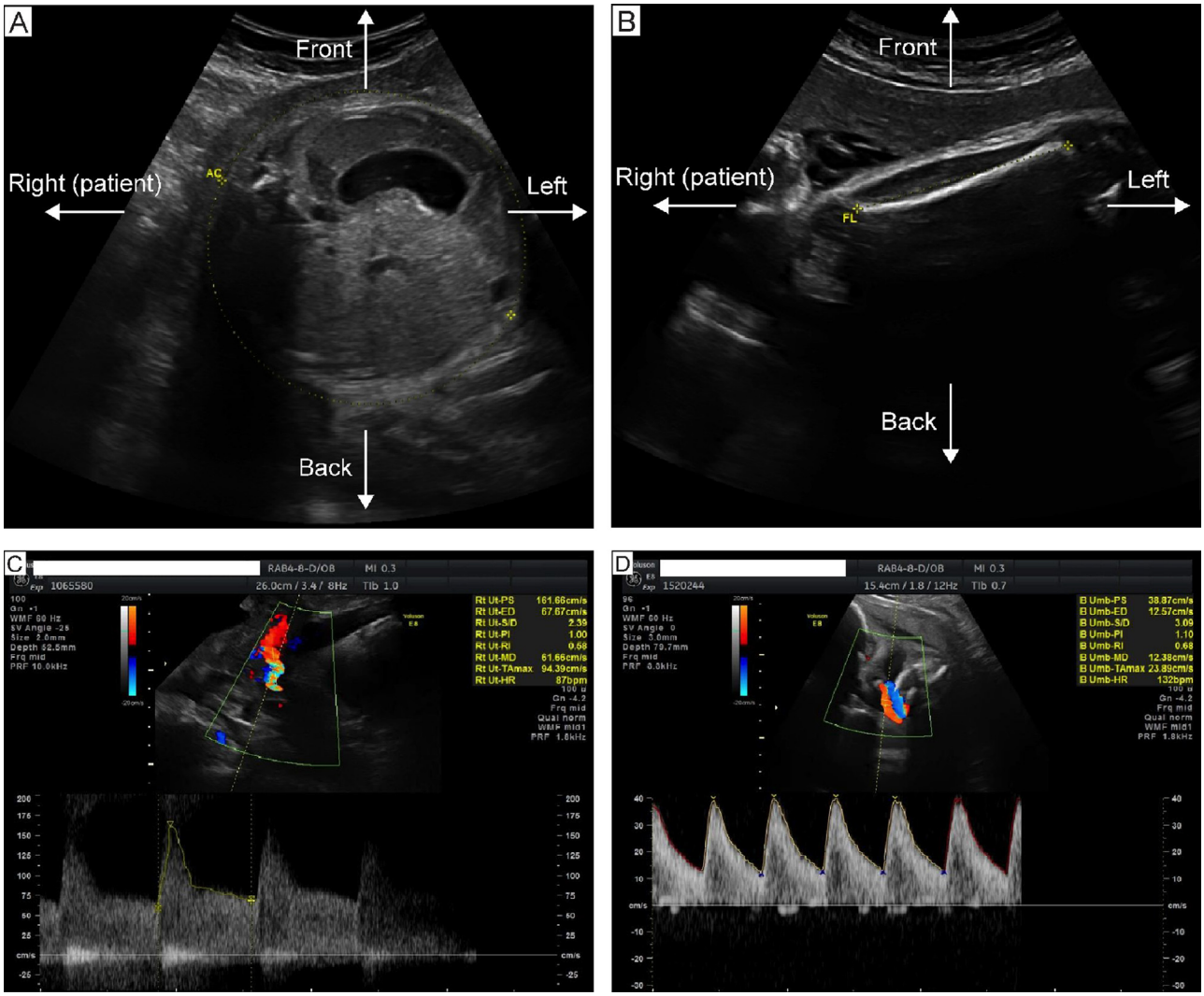

Fig. 1 – Fetal-maternal ultrasound assessment of study case at admission. (A, B) Fetal growth. (C) Uterine artery Doppler. (D) Umbilical artery Doppler. AC, abdominal circumference, FL, femur length.

unnecessary surgical interventions. This study describes the author's experience with intraoperative diagnostic procedures and the treatment of a 32-year-old pregnant patient with RSH.

Case presentation

A 32-year-old white woman (IV gravida/III para) with a pregnancy at the gestational age of 33 + 0 weeks was initially admitted to the medical ward of the Royal Free Hospital, London with a pulmonary embolism. The patient was treated with low-molecular-weight heparin for 3 days. The patient was subsequently referred to the antenatal ward at 33 + 3 weeks of gestation with gradually increasing, severe, right-sided abdominal pain to rule out any obstetric-related complications causing the pain. The course of pregnancy had so far been without complications. The patient had no history of trauma or previous surgical procedures. At 20 weeks, she had received a routine anatomical ultrasound scan that showed an anterior placenta, and there was no record of the presence of fibroids. Fetal ultrasound assessment at admission revealed a normal progression of pregnancy with a healthy fetal growth (Figs. 1A and B), a normal fetal-maternal Doppler assessment (Figs. 1C and D), and the placenta was located anteriorly. Cardiotocography (CTG) monitoring was stable for 30 minutes. The patient was hemodynamically stable with healthy vital signs, including 100/60 mm Hg blood pressure, 15 breathes per minute, a pulse of 100 beats per minute (bpm), and her temperature was 37°C. The patient had a mild maternal tachycardia, and physical examination revealed that the right side of the entire abdomen was tender to the touch, with no signs of rebound tenderness. However, a 14.2 × 8.24 cm, oval, well-demarcated, and heterogeneous mass on the upper right quadrant was identified that appeared to be attached to the fundal part of her uterus (Fig. 2). Its heterogeneous texture led to the suspected diagnosis of a retroplacental hematoma (abruption). However, fetal monitoring was normal at the time of diagno-

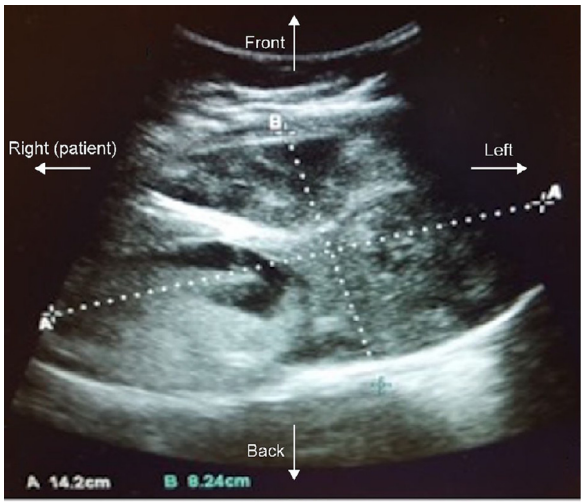

Fig. 2 – Ultrasound image of the heterogeneous structure identified before the C-section.

sis. At further differential diagnosis, this structure was considered to be a degenerated uterine fibroid, even though the patient did not have a history of fibroids. Therefore, the patient was placed on continuous CTG monitoring to timely detect any changes in fetal heart rate. Following a crash call due to a pathological trace four hours later (fetal bradycardia was 90-95 bpm with further signs of deterioration (Fig. 3)), the patient was immediately transferred to the operation room for an emergency cesarean section (C-section). The suspected diagnosis was placental abruption. During the C-section, no evidence of abruption was found. Further intra-abdominal cavity assessment indicated that the mass identified by ultrasound examination was a large RSH composed of approximately 2 L of blood clots. A postoperative computed tomography performed 24 hours after the delivery confirmed the diagnosis of RSH, and the regression of the hematoma (Figs. 4A and B). Postoperative clinical assessments revealed a rapid elimination of pain symptoms with a stable hemoglobin level (9.5 g/dL) and the absence of clinical complications.

Discussion

Several predisposing factors are associated with the genesis of RSH, such as advanced age, anticoagulant therapy, hypertension, paroxysmal coughing, previous abdominal interventions, trauma, blood dyscrasias, severe vomiting, and strenuous physical activities [4,6–8]. Anticoagulant treatment is the most common cause, and paroxysmal cough is the most likely precipitating factor [9]. According to Khan et al [5], RSH is an uncommon cause of gradual to acute abdominal pain and is becoming an increasingly common clinical condition due to the growing use of anticoagulant therapies for various purposes. In our case, the surgically discovered RSH was of the most severe type – Type III (the hematoma between rectus muscle and transversalis fascia) – that extended into the peritoneum and the prevesical space. Due to the absence of any other risk factors, this case of RSH can likely be attributed to anticoagulant therapy.

Although the exact incidence of this rare disorder is presently unknown, an incidence of 1.8% was reported among 1257 patients who underwent ultrasound for acute abdominal pain or unclear abdominal abnormalities [6,7]. RSH occurs most commonly in women (female to male ratio being approximately 2:1) in the fifth and seventh decades of life [10]. Among the female cases with RSH reported worldwide, only a few included cases during pregnancy [11]. However, this condition could potentially endanger both mother and fetus. Due to anatomical conditions, the hematoma can contain a large amount of blood, which can lead to hypovolemia and hemorrhagic shock, fetal hypoperfusion, and possibly maternal and fetal mortality [12]. The overall mortality for patients who receive low-molecular-weight heparin therapy is 25%, among which pregnant women and the developing fetus have a mortality rate of 13% and 50%, respectively [7,13]. For the pregnant case investigated here, the RSH caused severe complications, including hypovolemic maternal-placental-fetal perfusion, which subsequently led to the abnormal fetal trace (Fig 3) and indications for emergency C-section and premature delivery. This fetal trace abnormality indicates a significant decrease in fetal blood circulation and compromised fetal hemodynamics following the 30%-35% reduction in maternal blood

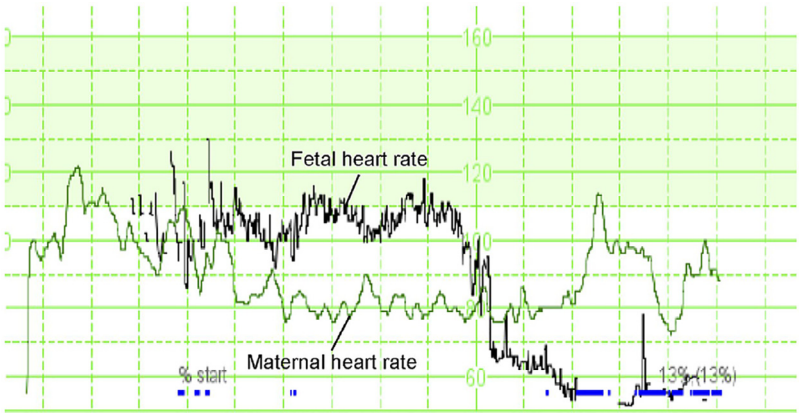

Fig. 3 – Cardiotocogram showing fetal bradycardia in the studied case.

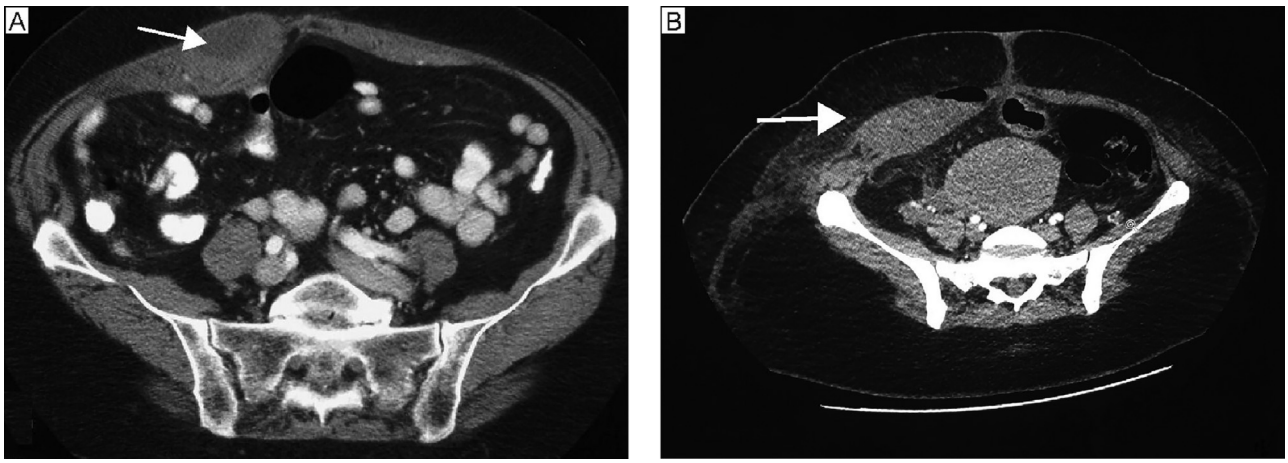

Fig. 4 – Postoperative cross-sectional CT scans of the RSH (white arrows) in the studied case. (A) Day-1 scan. (B) Follow-up scan.

circulation due to its accumulation in the sheath of the rectus (Fig. 2), while the mother remained hemodynamically stable. Because of its rare nature, the differential diagnosis of RSH was not made for the present case. If RSH had been suspected, it could have been confirmed prenatally using computed tomography, which is the gold standard diagnostic for RSH with approximately 98% sensitivity and specificity [10]. After confirmation, the condition could have been managed conservatively.

In conclusion, early diagnosis and treatment of RSH in pregnancy may prevent an unnecessary premature delivery that can have long-term impacts on the child's neurodevelopment and may cause disorders such as cerebral palsy. Hence, consideration of this condition as a differential diagnosis during prenatal assessments for every pregnant patient presenting with abdominal pain and treated with anticoagulants is vital for the timely management of RSH and could help prevent emergency C-sections in similar future cases.

REFERENCES

[1] Hatjipetrou A, Anyfantakis D, Kastanakis M. Rectus sheath hematoma: a review of the literature. Int J Surg 2015;13:267–71.
[2] Siu WT, Yau KK, Cheung HY, Law BK, Tang CN, Yang GP, et al. Spontaneous rectus sheath hematoma. Can J Surg 2003;46:390.
[3] Fitzgerald JEF, Fitzgerald LA, Anderson FE, Acheson AG. The changing nature of rectus sheath haematoma: case series and literature review. Int J Surg 2009;7:150–4.
[4] Daily JM, Adams JT, Fantini GA, Fischer JE. Abdominal wall, omentum, mesentery and retroperitoneum. In: Schwartz SI, Shires GT, Spencer FC, Daly JM, Fischer JE, Galloway AC, editors. Principles of Surgery. New York: McGraw-Hill; 1999. p. 1551–84.
[5] Khan A, Strain J, Leung PS, Kaplan MJ. Abdominal compartment syndrome due to spontaneous rectus sheath hematoma with extension into the retroperitoneal space. J Surg Case Rep 2017;2017:rjx226.
[6] Edlow JA, Juang P, Margulies S, Burstein J. Rectus sheath hematoma. Ann Emerg Med 1999;34:671–5.
[7] Klingler PJ, Wetscher G, Glaser K, Tschmelitsch J, Schmid T, Hinder RA. The use of ultrasound to differentiate rectus sheath hematoma from other acute abdominal disorders. Surg Endosc 1999;13:1129–34.
[8] Lambroza A, Tighe MK, DeCosse JJ, Dannenberg AJ. Disorders of the rectus abdominis muscle and sheath: a 22-year experience. Am J Gastroenterol 1995;90:1313–17.
[9] Berna JD, Zuazu I, Madrigal M, Garcia-Medina V, Fernandez C, et al. Conservative treatment of large rectus sheath hematoma in patients undergoing anticoagulant therapy. Abdom Imaging 2000;25:230–4.
[10] Buffone A, Basile G, Costanzo M, Veroux M, Terranova L, Basile A, et al. Management of patients with rectus sheath hematoma: personal experience. J Formos Med Assoc 2015;114:647–51.
[11] Tolcher MC, Nitsche JF, Arendt KW, Rose CH. Spontaneous rectus sheath hematoma in pregnancy: case report and review of the literature. Obstet Gynecol Surv 2010;65:517–22.
[12] Eckhoff K, Wedel T, Both M, Bas K, Maass N, Alkatout I. Spontaneous rectus sheath hematoma in pregnancy and a systematic anatomical workup of rectus sheath hematoma: a case report. J Med Case Rep 2016;10:292.
[13] Ducatman BS, Ludwig J, Hurt RD. Fatal rectus sheath hematoma. JAMA 1983;249:924–5.