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Case Report

Advanced abdominal ectopic pregnancy and the role of antenatal ultrasound scan in its diagnosis and management ☆,☆☆

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ABSTRACT

Abdominal pregnancy is a very rare form of ectopic gestation in which implantation occurs in the peritoneal cavity. It accounts for about 1% of all ectopic pregnancies and is associated with a higher risk of morbidity and mortality due to complications such as preeclampsia, placenta abruption, and oligohydromnios, which necessitate pregnancy termination before term, and the risk of massive hemorrhage associated with abnormal placentation.

We present a case of advanced abdominal ectopic pregnancy, diagnosed in the second trimester and complicated by anhydramnios. An abdominal ultrasound scan showed a non-gravid uterus and a single live extrauterine fetus within the abdominal cavity, with no surrounding liquor at 23 weeks and 3 days average gestational age. Mother was consented and an emergency laparatomy performed. A premature baby was delivered but died in Neonatal Intensive Care Unit (NICU) after 4 hours due to severe acute respiratory distress syndrome. Mother had good postoperative recovery.

Advanced abdominal ectopic pregnancy though very rare, is associated with complications that lead to early termination. Ultrasound scan is a reliable tool for the diagnosis of abdominal pregnancy in settings with limited access to Magnetic Resonance Imaging (MRI). It should be recommended to all mothers at their earliest antenatal care (ANC) visit to help determine the site of pregnancy and guide further intervention.

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List of abbreviations: ANC, Antenatal care; APGAR, Appearance, Pulse, Grimace, Activity and Respiration; CBC, Complete Blood Count; mmHg, Millimeters of Mercury; MRRH, Mbarara Regional Referral Hospital; NICU, Neonatal Intensive Care Unit; PG, Prime gravida.

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Introduction

Ectopic pregnancy refers to implantation that occurs outside the uterine cavity [1]. Ectopic pregnancies account for 1%-2% of all pregnancies, with 95% of them found in the fallopian tubes [2,3]. Other locations for ectopic pregnancy include the uterine cornua, ovaries, cervix, cesarean section scar site, and abdominal cavity [4]. In abdominal ectopic pregnancy, implantation occurs in the peritoneal cavity and accounts for 1:10,000-1:30,000 live births [5,6].

Potential sites for implantation of the fertilized ovum in the peritoneal cavity include omentum, pelvic side wall, the pouch of Douglas, spleen, bowel, liver, large pelvic vessels, diaphragm, and uterine serosa [7]. Factors attributed to a higher occurrence of abdominal ectopic pregnancies are low socioeconomic status, recurrent pelvic infection, history of infertility, tubal ligation, tubal reconstruction surgery, and pregnancy that occurs with an intra-uterine device in situ [8].

Abdominal pregnancy is categorized as primary if the zygote directly implants in the peritoneal cavity [9] or secondary, with the latter as the majority [8]. The criteria set by Studdiford for primary abdominal pregnancy include normal fallopian tubes and ovaries, no uteroperitoneal fistula, implantation to the peritoneal surface only (diagnosed earlier than 12 weeks), and exclusion of secondary abdominal ectopic pregnancy [10].

There is a higher rate of morbidity and mortality associated with abdominal ectopic pregnancy in comparison to intrauterine pregnancy. This is due to complications that occur as a result of abnormal placentation, such as preeclampsia, premature placental separation (abruption), and oligohydromnios from the leaking of liquor [8,11]. These complications often necessitate early termination of the pregnancy resulting in poor perinatal outcomes due to severe prematurity. That notwithstanding, some term abdominal ectopic pregnancies have been reported in the literature [6,7].

We present a case of advanced abdominal ectopic pregnancy diagnosed in the second trimester, complicated by anhydramnios leading to early termination and subsequent fetal death due to severe acute respiratory distress syndrome.

Case presentation

A 30-year-old prime gravida (PG) was referred to Mbarara Regional Referral Hospital (MRRH) from a peripheral clinic due to a sonographically diagnosed abdominal ectopic pregnancy at 23 weeks and 3 days gestational age, with anhydramnios.

The patient had 1-week history of mild abdominal pain and no other complaint. Her first antenatal care visit was at 16-week of gestation where an abdominal ultrasound scan (Fig. 1) showed a single live extrauterine fetus within the abdominal cavity surrounded by an amniotic membrane. The uterus was nongravid and had a small intramural fibroid. There was reduced liquor within the gestational sac and moderate free fluid collection was seen in the posterior cul-de-sac. She was managed conservatively for 7 weeks after which she did a review scan that revealed anhydramnios prompting referral to MRRH.

On admission, she was in good general condition, with no conjunctival pallor, no jaundice, no edema, and not dehydrated. Her vital observations were normal with a blood pressure of 118/72 mmHg and a pulse rate of 81 beats per minute (bpm).

Abdominal examination revealed palpable fetal parts in the abdomen and a fetal heart rate of 162 bpm by fetal Doppler. The rest of the systemic examination was unremarkable.

Laboratory tests showed mild normocytic normochromic anemia (Hemoglobin (Hb) – 10.2g/dL) while the rest of the parameters were unremarkable. White blood cell count (WBC)-6.9 × 10^9/L, Neutrophils – 4.1 × 10^9/L, Platelets – 175 × 10^9/L, Sodium – 142 mmol/L, Potassium – 4.4 mmol/L, Chloride – 109 mmol/L, AST – 14 u/L, ALT – 16 u/L, Creatinine – 0.7 mg/dL, Urea – 8.8 mg/dL.

A repeat ultrasound scan at MRRH (Fig. 2) showed a nongravid uterus and a single live extrauterine fetus within the abdominal cavity with no surrounding liquor. Average gestational age was 23 weeks and 3 days and fetal heart rate was 146 bpm. There was normal cord insertion with the placenta implanted at the uterine fundus evidenced by bridging veins seen on color Doppler (Figs. 2E & F). Maternal organs including the liver, spleen, pancreas, and both kidneys were normal.

Management

The mother was immediately consented for an emergency laparatomy following the ultrasound scan. A live male baby (Fig. 3) *was* found enclosed by omentum. He was successfully delivered, had an Apgar score of 5 at 1 minute and 8 at 5 minutes, and weighed 533 grams. The baby was immediately transferred to neonatal intensive care unit (NICU) for further management. The placenta was safely separated from the uterine fundus and hemostasis was achieved, with the rest of the intraoperative procedures successfully completed. Estimated intraoperative blood loss was about 800 mLs and the mother was transfused with 2 units of whole blood since preoperative Hb was low.

Unfortunately, the baby died in the NICU after 4 hours of admission due to severe acute respiratory distress syndrome. This was attributed to pulmonary hypoplasia following a prolonged period of oligohydramnios. The mother recovered well postoperatively and was discharged after 5 days with no major complaint. The mother was followed-up by phone calls (was unable to return to MRRH due to the cost of transport) up to the end of the puerperium and no complications were reported.

Discussion

Our case of advanced abdominal ectopic pregnancy complicated by anhydramnios at 23 weeks of gestation, emphasizes the high rate of complications that occur with abdominal ectopic pregnancies. Despite initial attempts to conservatively manage amniotic fluid leakage at 16 weeks of pregnancy, ter-

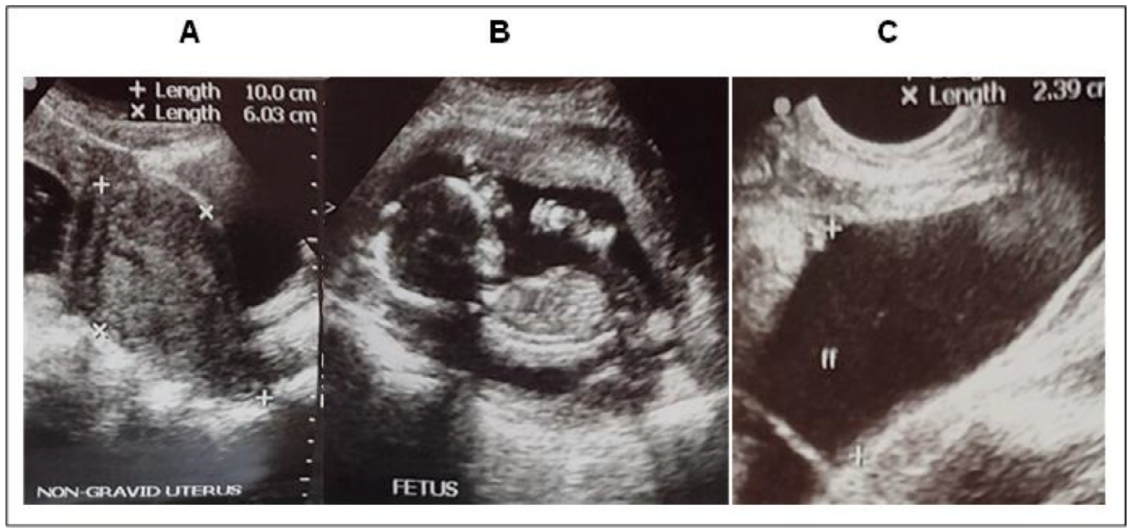


Fig. 1 – Gray scale ultrasound scan images obtained at 16 weeks gestation show a nongravid uterus (A), an extra-uterine fetus within the abdominal cavity surrounded by reduced amniotic fluid levels (B), and moderate free fluid collection in the posterior cul-de-sac with a depth of approximately 2.4 cm (C).

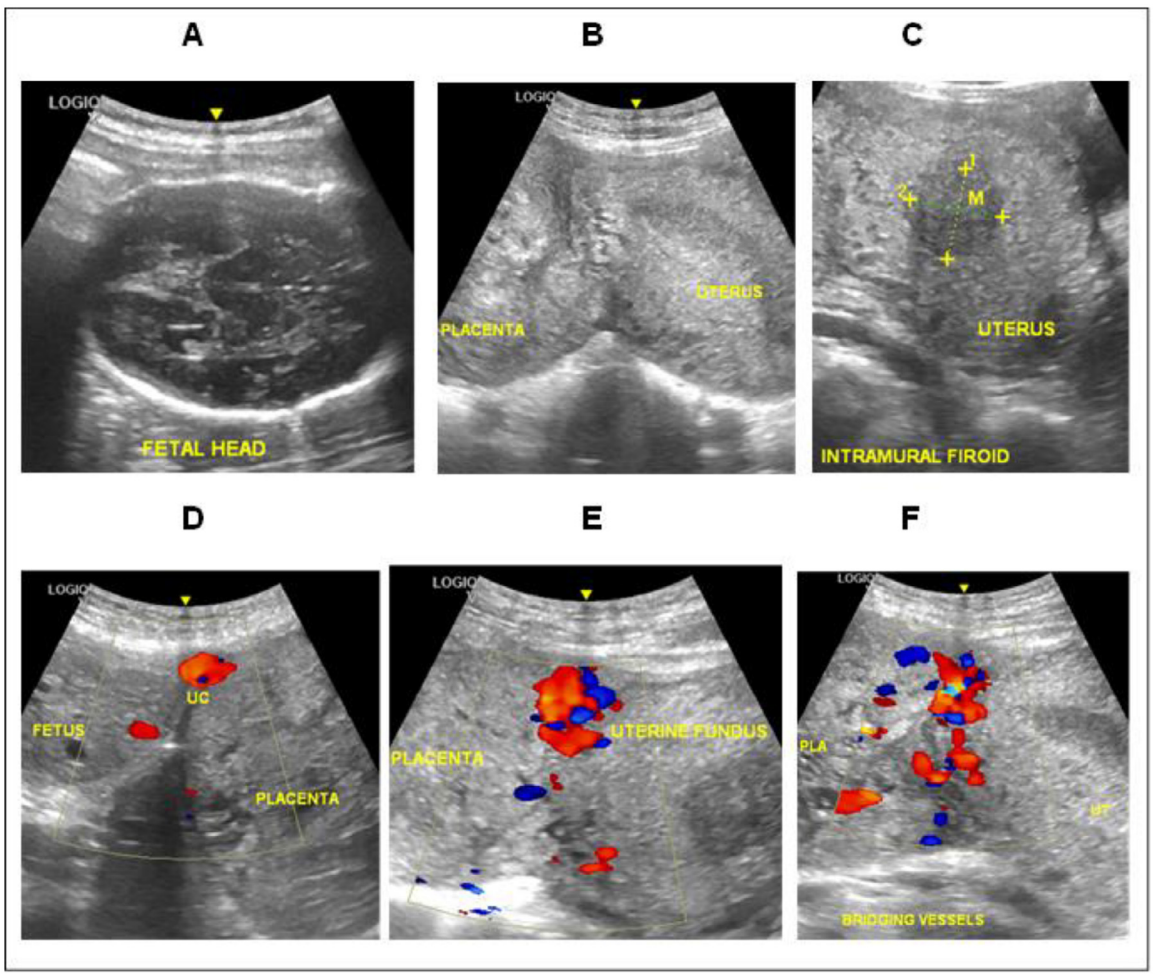


Fig. 2 – Grayscale and color Doppler ultrasound scan images obtained at 23 weeks gestation, showing the fetal head (A), implantation of the placenta at the uterine fundus (B), a small intramural fibroid (2.7 x 2.7 cm) (C), fetal abdomen and placenta (D), and placenta bridging vessels at the implantation site (E & F).

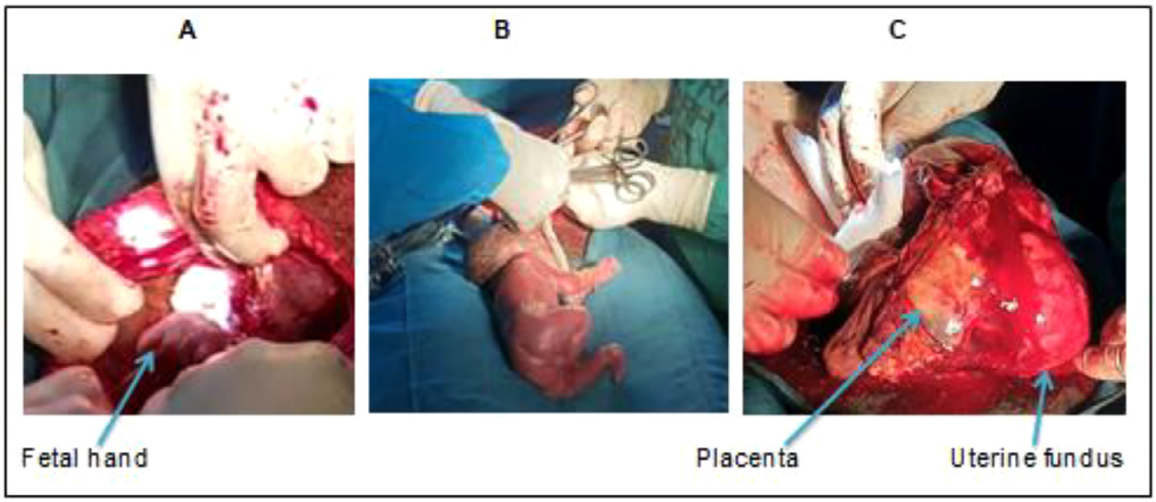


Fig. 3 – Intraoperative images show the fetus within the abdominal cavity (A), the baby after delivery with the cord being ligatured (B) and the placenta implanted at the uterine fundus (C).

mination was done 7 weeks later due to complete loss of amniotic fluid. Additionally, the case emphasizes the role of early antenatal ultrasound scans in the diagnosis of abnormal pregnancies and guiding further management.

Advanced abdominal ectopic pregnancy which is pregnancy with viability beyond 20 weeks of gestation is very rare [12]. During the early part of pregnancy, the mother may not suspect an ectopic pregnancy since the presentation may be similar to a normal pregnancy until complications occur [13]. This is worse in low and middle-income countries where the first antenatal care (ANC) visit in the majority of pregnant mothers occurs in the late second trimester [14].

Risk factors for abdominal pregnancy include recurrent pelvic inflammatory disease, assisted reproductive technology, history of tubal surgery, endometriosis, low socioeconomic status, and pregnancy with an intrauterine device in situ [15,16]. In our case, the patient had been married for 3 years without getting pregnant. She had no history of tubal surgery and did not have assisted reproduction. Pelvic adhesions were found intraoperatively, and since she had no history of abdominal surgery, it was attributed to previous pelvic inflammatory disease, one of the key risk factors for abdominal pregnancy [17].

Late ANC attendance coupled with limited access to antenatal ultrasound scanning, may lead to a late diagnosis of an abdominal pregnancy if no severe symptoms such as abdominal pain have occurred [7]. Therefore antenatal ultrasound scanning during early pregnancy is an essential tool that can help in making a diagnosis of abdominal pregnancy and guide early decision-making to avert possible maternal mortality [18]. In our case, the patient had her first ANC visit at 16 weeks of gestation following a 1-week history of lower abdominal pain. During the same visit, an obstetric ultrasound scan was done which showed a single live extrauterine pregnancy within the peritoneal cavity with gestational age corresponding to weeks of amenorrhea.

Ultrasound imaging is reliable in the diagnosis of abdominal ectopic pregnancies and shows an extrauterine gestational sac or fetus separate from a nongravid uterus, adnexa, and ovaries [15]. Other features include an extrauterine placenta, abnormal fetal presentation, lack of myometrial tissue around the fetus, and reduced or absent amniotic fluid [15,16]. In our case, ultrasound showed an extrauterine fetus separate from a nongravid uterus with no myometrium or amniotic fluid around the fetus. The placenta was implanted on the uterine fundus evidenced by bridging veins seen on color Doppler and confirmed intraoperatively. Where ultrasound findings are equivocal, magnetic resonance imaging (MRI) is recommended due to its high accuracy in determining extrauterine pregnancy and placenta attachment [19,20]. The drawback is availability, accessibility, and affordability in resource-limited settings hence the reliance on ultrasound scans for diagnosis and guiding intervention.

While a number of cases of abdominal ectopic pregnancies reaching term have been reported in the literature [5,21–24], and expectant management may be attempted in some cases, termination of pregnancy by laparatomy is recommended when the diagnosis is made before 24 weeks. This is due to the high mortality rates associated with massive hemorrhage that may occur from the abnormal implantation [25]. Intraoperatively, the placenta may be fully extracted or left in situ depending on the site of implantation for fear of uncontrollable hemorrhage [7,26,27]. Massive hemorrhage can be prevented by arterial embolization of the placenta bed which is done prior to surgery or after if the placenta is retained [28,29]. In our case, conservative management was initially attempted at the peripheral clinic when the diagnosis was first made at 16 weeks gestation. Pregnancy termination was carried out 7 weeks later at MRRH due to anhydramnios. Intraoperatively, the placenta was found implanted on the uterine fundus, was easily separated from its attachment, and hemostasis was achieved.

Conclusion

Advanced abdominal ectopic pregnancy, though very rare, is associated with complications that necessitate early termi-

nation of the pregnancy. While MRI is more accurate and is recommended to confirm and characterize extrauterine pregnancy, an ultrasound scan is a reliable tool for the diagnosis of abdominal pregnancy in resource-limited settings and should be recommended to all mothers at their earliest ANC visit to help determine the site of pregnancy and guide further intervention.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal. The case report was approved for publication by the Mbarara University of Science and Technology Research Ethics Committee under approval number MUREC 1/7.

Availability of data and material

Yes, the data is available and accessible.

Authors contributions

AB and JR collected the clinical data and wrote the case report. AB, PB, MA, and MJ interpreted the images, and proofread the case report. All authors approved the final case report

Patient consent

Written consent for publication was obtained from the patient. Approval to publish has been given by my organization/institution's ethics committee, and in accordance with local legislation.

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