*West African Journal of Radiology*
*April 2009 Vol. 16 No. 1*

# Sonographic Triad In Abdominal Pregnancy: Illustration With Four Cases

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## ABSTRACT

Background: Abdominal pregnancy (AP) is a rare form of ectopic gestation with a high morbidity and mortality. The diagnosis is difficult because of its relatively non-specific asymptomatic nature and non-specificity of symptoms. Ultrasonography may be the first pointer to the diagnosis. METHODS: Four cases of AP diagnosed between 16-38weeks gestation and had laparotomy confirmations are presented. Focused obstetrics ultrasound scans, which sought to identify the upper vagina, cervix and uterus assisted our diagnosis. RESULTS: Our first case of AP was missed at ultrasonography. Thereafter, three consecutive cases were correctly diagnosed. Only one out of our four patients had the pregnancy delivered of live baby. The unique sonographic features common to all are triad of masses: the empty uterus, the placenta and the closely packed bowel loops with omentum. CONCLUSIONS: In obstetrics scan, the finding of unusual lower intra-abdominal masses during panoramic scans should arouse Sonologists or Sonographers to suspect AP until rigorous and lucid pelvic ultrasound scans that must have identified the upper vagina, cervix and the uterus prove otherwise.

**KEYWORDS:** Abdominal pregnancy, Ectopic pregnancy, uterine fibroid. Obstetrics ultrasonography

## INTRODUCTION

About 2% of all pregnancies are ectopic out of which 1-4% is abdominal pregnancy (AP) [1-5]. The worldwide incidence of AP is about 1/10, 200-33,000 deliveries [2]. However, it is as high as 1 in 654 deliveries in a hospital based study in southwestern Nigeria [3]. The varying and non-specific presentations often make AP a diagnostic dilemma [2, 5]. The symptoms and signs to suspect an AP include abdominal cramps, vaginal spotting/bleeding, nausea, vomiting, malaise, painful fetal movement and readily palpable fetal parts with abnormal lie, which is similar to findings in ruptured uterus [1-4].

Sonography, which remains the front-line diagnostic modality of choice may, miss the diagnosis of AP unless there is good index of suspicion [5-8]. Where ultrasound result is insufficient or inconclusive, Magnetic Resonance Imaging (MRI) is the imaging gold standard because of its excellent tissue contrast and multiplanar imaging capabilities [9, 10]. MRI can accurately demonstrate an extrauterine gestation, the location of the placenta within the abdomen, the vascularity of the placenta and the presence of placental adherence, which may directly, affect the decision whether to remove or leave the placenta in situ [9, 10]. In spite all these novel attributes of MRI, it is unlikely there will be a significant switch to it in the nearest future especially in the developing world because of relative high cost, which has limited its availability.

This report details our sonographic experiences with four cases of AP. The triad of masses, a unique sonographic features common to all our cases is presented to enhance ultrasonic diagnosis in AP.

## MATERIALS AND METHODS

The patients were scanned with Siemens SI 400 and Siemens Sonoline SX Ultrasound machines equipped with 3.5 and 5.0MHz transducers and electronic calipers for measurement. All scans were done in the supine position using the trans-abdominal approach with moderately filled urinary bladder. Coupling gel was used to eliminate air gap between transducer and the skin surfaces. Multiple longitudinal and transverse scans were done to localize the upper vagina, the cervix, the uterus,

placenta and fetus. Their relationships were determined to diagnosed intra or extra-uterine pregnancies. All the patients diagnosed sonographicaly of AP had it confirmed at Laparotomy. Placental management, outcome of laparatomy and post operative morbidity were evaluated.

**RESULTS**

Our first case of AP was missed at ultrasonography because the vague intra-abdominal masses observed were incorrectly reported as degenerated uterine fibroid. Three other cases thereafter were correctly diagnosed. Triads of masses that comprised of empty uterus, extrauterine placenta and closely packed bowel loops with omentum were constant feature. Only one patient had live birth. There was no false negative ultrasound diagnosis of AP. Posterior placenta adherent to the root of the mesentery was present in the two patients with term AP. Both patients had plancenta left in situ at surgery because of failed attempted delivery, had prolonged hospitalization of about two months, severe anaemia and wound breakdown.

**CASE PRESENTATION**

We encountered four cases of APs within a 10-month period at our centre during routine Obstetric scans. None of the cases had clinical diagnosis of AP at presentation.

**Case 1:** A healthy G3P2 $^{+0}$ woman had ultrasound scan at 18weeks gestational age which revealed oligohydramnios and some masses at the lower abdomen compressing and displacing the urinary bladder anteriorly and the fetus posteriorly. These masses were assumed as degenerated cervico-uterine fibroids. Two weeks later, patient had acute abdominal pain, anaemia, fetal death and intra abdominal fluid collection. An abdominal tap was bloody leading to the suspicion of ruptured ectopic. Emergency laparatomy revealed AP. Placenta occupied the pouch of Douglas and was attached to the uterus, broad ligament and posterior abdominal wall. Patient postoperative period was good.

**Case 2:** An unmarried 17-year-old lady who had only menstruated thrice and was unsure of her last menstrual date presented with fever, occasional vomiting, recurrent lower abdominal pain and diarrhoea. She denied previous history of coitus. She had been managed at a private hospital as case of malaria and suspected typhoid for 5days with no improvement. At presentation, she was ill-looking, pale (Pack cell volume was 23%), abdomen was tender with guarding. An assessment of perforated typhoid was made. However, emergency ultrasound scan revealed a live fetus of 16weeks 3days gestational age within the abdominal cavity (fig. 1). The posterior attached placenta displaced the normal sized empty uterus anteriorly. This together with some closely packed bowel loops simulate a degenerated fibroid. There were also some echogenic structure suspected to be haematoma. The diagnosis of abdominal pregnancy was made. Patient had emergency laparatomy to terminate the pregnancy. Her postoperative recovery was good and she was discharged 10days later.

**Case 3:** A 35-year-old G4P3 $^{+0}$ 2 alive woman, unsure of date but could recall the last month of menstruation was referred to our emergency obstetrics outpatient department on account of severe anaemia in pregnancy from a private hospital where she had booked for antenatal care. She has had three previous ultrasound scans at 16, 22 and 28weeks gestational ages. All reported as live intrauterine fetus with posterior placentation and coexisting sub-serous uterine fibroid. Our scan revealed three masses, which were identified as uterus, placenta and closely packed bowel loops containing faecal matter, in addition to a live fetus of 35-week gestational age (fig. 2). She was booked for emergency laparotomy that was delayed for various reasons that included inability to secure enough blood for transfusion. While awaiting laparotomy, she had a repeat episode of severe abdominal pain and fainted. She had severe anaemia that necessitated resuscitation by a further transfusion of 3 units of packed blood cells. Fresh still baby girl weighing 2.85kg was delivered at surgery. Placenta was adherent to the root of the mesentery and was left in situ because of difficulty at securing haemostasis. She had a total of 24 pints of blood transfused from admission to the fifth postoperative days. She had 2months hospitalization because of sepsis, wound breakdown and anaemia.

**Case 4:** An unbooked 37-year-old G3P2$^{+0}$, who slipped and fell complained of mild abdominal pain a day after. She had no bruising, bleeding or headache. Ultrasound scan revealed an extra-uterine live fetus of 38weeks + 6days gestational age, lying

transversely in the upper quadrant. The bulky but empty uterus, the placenta attached to the posterior abdominal wall and the closely packed bowel loops in the sigmoid area, on panoramic scans appeared as three separated masses (fig. 3). Patient was delivered operatively of a live male fetus and placenta left in situ. Both mother and baby did well postoperatively except for wound sepsis.
Endometrial plate thickening was present in all the above patients.

## DISCUSSION

Abdominal pregnancy is one of the very rare forms of ectopic pregnancy but the most severe in term of morbidity and mortality [1-6]. Its mortality is about eight times that of tubal ectopic, which constitute over 95% of ectopic pregnancies [2, 4]. Unlike the maternal mortality associated with AP that ranges between 2 to 30%, the fetal mortality ranges between 40 to 95% [2, 4]. Yet, the diagnosis of this grievous condition is missed in up to 50% 0f cases until severe haemorrhages or failed induction has occurred [1, 4, 8]. The principal diagnostic impediment is low index of suspicion because of the relatively asymptomatic nature and the lack of specificity of symptoms when present [6]. High index of suspicion may reduce the diagnostic error of this condition, whose prenatal and maternal mortality is about 8 times that of tubal ectopic and about 90 times that of intrauterine pregnancy [4,5].
Ultrasound, which is readily available, relatively cheap and has no known complication at diagnostic scan, is an imaging of choice to aid the diagnosis. Aside aiding early diagnosis, ultrasound also allow for an easy mini-invasive endoscopic treatment of the potentially life threatening pregnancies and as follow up monitoring of placenta involution after delivery [8-11].
The sonographic findings to guide the diagnosis of AP include identification of an empty uterus separate from the fetus, extra uterine placenta, oligohydramnios, absence of myometrium between fetus and abdominal wall, placenta previa appearance and abnormal fetal lie [6-9]. Despite these, the ultrasonic diagnosis still remains difficult and is missed in one-fourth of reported cases [1, 8]. Thus, the need to identify specific sonographic features that will guide and improve the sonographic diagnosis, which is the basis of this report is imperative.
The complexity of AP, the management challenges and the attendant morbidity of our first missed case led to a vigorous review of the sonographic features, which were misinterpreted. The obvious sonographic appearances in all our cases on panoramic scans were unusual solid masses of intermediate to high echoes especially in the lower abdomen. These we have termed sonographic triad of masses in AP, is composed of enlarged empty uterus, placenta tissue, and omentum with the closely packed bowel loops. Thus, the sonographic finding of unusual lower intra abdominal mass(es) in a pregnant woman should arouse the suspicion of sonologist or sonographer to pay special attention to pelvic scan. In such instances, suspect AP until rigorous and lucid ultrasound scans prove otherwise. Where AP is suspected, we advise for focused pelvic scans that must identify the upper vagina, cervix and the uterus to reduce the sonographic incidence of missed AP. Mere identification of an intrauterine fetus is not sufficient to abolish such lucid scans, as cases of intrauterine gestation with coexisting abdominal pregnancy have been reported [12].
Stanley et al [1] in 1986 found out that the most frequent and reliable reported sonographic findings in AP are separation of the uterus from the fetus, extrauterine placenta, and oligohydramnios in decreasing order of frequency [1]. Other features include fetal parts close to the maternal abdominal wall, failure to visualize myometrium between the fetus or placenta and maternal bladder, abnormal fetal lie, poor visualization of the placenta, and maternal bowel gas impeding fetal visualization [1, 6-8].
Oligohydramnios was observed in one of our four patients while the above sonographic features were present in all. The endometrial thickening (reaction) present in all our patients is documented finding in extrauterine pregnancies [1, 12].
It is worthy to note some reported findings that can mimic AP and exclude such. These findings include pregnancy in a bicornuate uterus, pedunculated uterine fibroids associated with a gravid uterus, degenerated fibroid in pregnancy and even an early normal pregnancy in a sharply retroflexed or anteflexed uterus [1, 4, 5].

## CONCLUSIONS

In obstetric scan, it is essential to define the uterus and the upper vagina to improve ultrasonic diagnosis of AP. The presence or identification of non-specific lower intra-abdominal masses during panoramic scans of such patients should arouse the suspicion of AP until lucid ultrasonic evaluation proved otherwise.

**Fig. 1: Trans-abdominal ultrasound images of a 17-year-old with abdominal pregnancy. Note the empty uterus (notched white arrow), posteriorly located placenta outside the uterus (straight arrow) and bowel loops (U-turned arrow).**

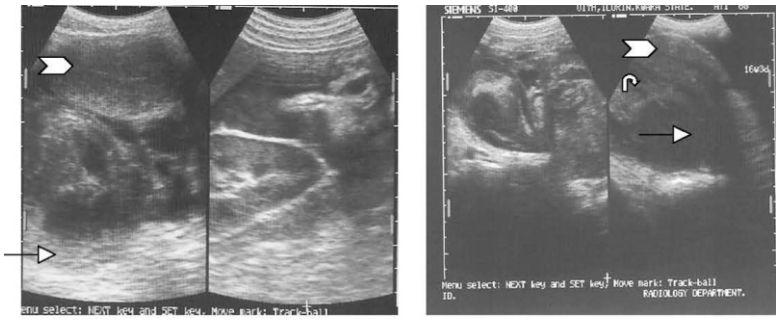

Fig.1 A B

**Fig. 2: Ultrasound images of a 35-year-old G4P3$^{+0}$, 2 alive woman diagnosed of abdominal pregnancy at 35weeks getational age. Note the absence of uterine wall between the placenta and the abdominal aorta. The empty uterus (notched white arrow), posteriorly located pacenta outside the uterus (straight arrow) and bowel loops (U-turned arrow).**

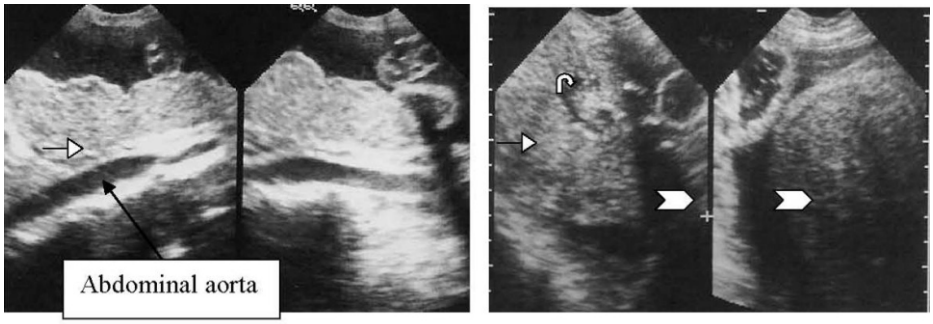


Fig. 2A B

**Fig.3: Ultrasound images of a 37-year-old G3P2$^{+0}$ with advanced abdominal pregnancy of 38weeks 6days showing empty but bulky uterus (notched arrow), placenta outside the uterus but in contact with uterine fundus (straight arrow) and the closely packed bowel loops (U-turn arrow). Note the appearance of uterus in (B) may easily be mistaken for uterine fibroid.**

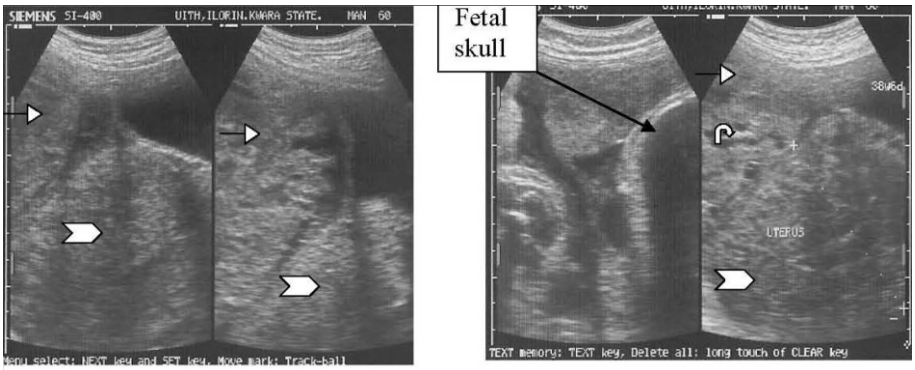


Fig. 3 A B

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