

## Ultrasound Scan Finding in 72 Consecutive Patients Suspected to Have Ectopic Pregnancies, at the Lagos State University Teaching Hospital, Ikeja, Nigeria

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### Abstract

**Context:** The decision whether, or not, to take a patient who presents with clinical symptoms suggestive of ectopic pregnancy to theatre for an invasive procedure can be a difficult task for the gynaecologist. Serum beta-hCG assays, ultrasonography and laparoscopy help in this decision making.

**Objective:** A prospective ultrasonic study of 72 patients, suspected to have ectopic pregnancy, was undertaken to analyse transabdominal ultrasound findings in them and assess its value in making the diagnosis.

**Methods:** All patients who presented with complaints such as vaginal bleeding, delayed menstrual period, lower abdominal pain, and clinical signs suggestive of ectopic pregnancy, such as an adnexal mass, at the gynaecological emergency unit were recruited for this study. Transabdominal longitudinal and transverse scans were performed with a full bladder. The results were correlated with intraoperative findings where applicable and the findings were analysed.

**Results:** Extrauterine masses were seen in 46 patients (63.9%), 5 of whom had distinct extrauterine gestational sacs. Twenty patients (27.7%) were diagnosed as having ectopic pregnancies by ultrasound. Only 14 patients with ultrasound diagnosis of ectopic pregnancy came to surgery and the diagnosis was confirmed in 12 (85.7%).

**Conclusion:** Ultrasound is found to offer a complementary solution to the diagnosis and management of ectopic pregnancy. It does not however exclude the importance of proper history taking and clinical examination.

**Key Words:** Ectopic Pregnancy, Transabdominal, Ultrasonography, Laparoscopy [Trop J Obstet Gynaecol, 2006, 23:118-122]

### Introduction

Ectopic pregnancy remains a major problem in contemporary gynaecology. Its incidence has roughly doubled in most parts of the world since the mid 1960s<sup>1</sup> and it has continued to contribute significantly to maternal mortality, particularly in the underdeveloped countries like Nigeria<sup>2</sup>. Various reasons have been adduced for this increasing incidence. These include the increasing incidence of pelvic inflammatory disease<sup>3</sup>, increasing use of the intrauterine contraceptive device<sup>4,5</sup> and the availability of better means of diagnosis<sup>1</sup>. The morbidity and mortality associated with ruptured ectopic pregnancy has spurred researchers into the development of investigative procedures which would facilitate early diagnosis before rupture occurs. Ultrasonography has become one of the most important of these modes of investigation<sup>6</sup>. Early diagnosis reduces the morbidity and mortality of this condition.

The diagnosis of tubal pregnancy is often very difficult prior to rupture, as the classical symptoms and signs are often absent and a pregnancy test may be negative in as many as 50% of cases<sup>7</sup>. Early recognition is difficult, despite the availability of a large number of diagnostic procedures such as serial haematocrit determination, serum beta-hCG, culdocentesis, paracentesis, culdoscopy, endometrial sampling, hysterosalpingography, laparoscopy and ultrasonography<sup>8</sup>.

The cardinal symptoms of ectopic pregnancy are secondary amenorrhea, abdominal pain and abnormal vaginal bleeding. Adnexal and reflex cervical excitation tenderness are the principal signs. About 10-15% of patients report with syncope, shoulder tip pain or an urge to defaecate and 5-10% would have passed a decidual cast. Shock is present in 15-25% of cases<sup>1</sup>. These signs and symptoms are however elicited late when rupture has occurred. The diagnosis of ectopic pregnancy is often made late or missed prior to rupture, with the catastrophe attendant when rupture is not averted. There is therefore need for an accurate, rapid and sensitive diagnostic aid for ectopic pregnancy, especially before rupture. This is provided by ultrasonography when combined with some clinical investigations such as laparoscopy and beta subunit of chorionic gonadotropin test ( $\beta$ -hCG)<sup>1</sup>

This study was undertaken to analyse the ultrasonographic findings of 72 consecutive patients with suspected diagnosis of ectopic pregnancy seen at the Radiology Department of the Lagos State University Teaching Hospital in the period, 1<sup>st</sup> February, 2003 to 31<sup>st</sup> January, 2004

### Materials and Methods

Seventy two consecutive patients who were suspected to have ectopic gestation were scanned. They were

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referred from the emergency unit and gynaecology ward of the Lagos State University Teaching Hospital from February, 2003 to January, 2004. Presenting complaints included lower abdominal pain, delayed menstrual cycle, abnormal vaginal bleeding, fainting spells and palpable abdominal swellings.

All patients were scanned transabdominally with a full bladder, avoiding overdistension. Scans were undertaken in longitudinal and transverse planes, using a real time scanner with a suitable time gain [Schimadzu Schimasonic SDL-300 with a 3.5 megahertz transducer]. A curvilinear probe which allows better visualization of the pelvic side walls was used in most patients. In a few of the patients, a linear probe was employed. The accurate duration of pregnancy was assessed by measuring the gestational sac volume, crown rump length or biparietal diameter. The presence or absence of fetal pole, fetal activity and fetal heart movement were noted. Presence of intrauterine gestational sac or tuboovarian masses was observed. The cul de sac was examined for fluid. When the fetus was seen outside the uterus, fetal heart movement was looked for.

The diagnosis of ectopic pregnancy was made when an empty uterus, bulky or not is seen, with a thickened endometrial plate or decidual reaction. The uterus is considered bulky when it measures more than 80x40x40mm in a nulliparous and 95x55x55mm in a multiparous patient<sup>9</sup>. A gestational sac may be seen outside the uterus with or without a live fetus. The

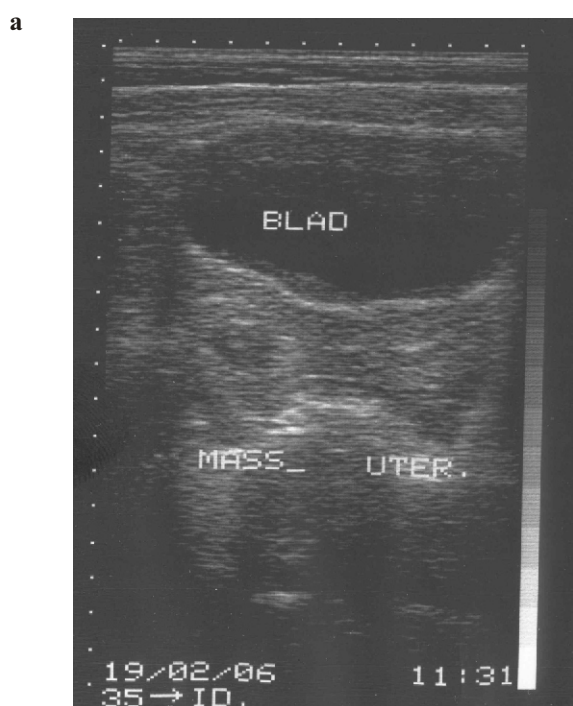
extrauterine pregnancy may be in the form of a complex tuboovarian mass due to haematoma formation. Uterine fibroids showed as solid hypoechoic or echogenic masses within a normal sized or bulky uterus. Ovarian cysts are seen as well defined masses which were either anechoic or of mixed echoes. They are either uni- or multi-loculated, with or without septations. When ruptured, they presented with free fluid in the peritoneum, thus simulating a ruptured ectopic pregnancy.

### Results

The age distribution of the 72 patients scanned was between 16-45 (mean 27.5) years. The ultrasonic gestational age at presentation varied between 4-25 weeks. The mean gestational age was 9.7 weeks. In 37 patients, pelvic inflammatory disease or ovarian cysts were the clinical differential diagnosis. Only 34 (47.2%) of the presenting patients knew the date of their last menstrual period. The others were not sure of their dates because they were bleeding intermittently per vaginam. Sixty patients did a pregnancy test prior to presentation and of these, fifty five were pregnancy positive, four were negative and one was equivocal.

Table 1 shows the provisional ultrasonic diagnosis. Three patients (4.2%) had normal anatomy of their reproductive systems while normal intrauterine pregnancies were seen in fifteen patients (20.8%). Extrauterine masses were seen in 46 (63.9%) of the patients (Figure 1), five of whom had extrauterine gestational sac. Two of the gestational sacs had live

Figure 1



Transverse Scan



Longitudinal Scan

fetuses while a pseudogestational sac was seen in 4 (5.6%) as illustrated in Table 2

The ultrasonic signs detected in patients suspected to have ectopic pregnancy are highlighted in Table 2.

Twenty-one patients had surgery and this included 14 of the patients confirmed to have ectopic pregnancy on scanning. Twelve (85.7%) of the latter patients had ectopic pregnancies at operation while one (7.1%) had an intrauterine pregnancy co-existing with a corpus luteum cyst. The other patient (7.1%) who turned out to have an ectopic gestation at operation was misdiagnosed as a pelvic abscess on ultrasound. Table 3 shows the operative findings in the twenty-one patients operated. Twelve of the ectopic pregnancies diagnosed by ultrasound were confirmed at operation. Five ultrasonically diagnosed ovarian cysts were confirmed at surgery. Two of the ovarian cysts were ruptured while the others were torted..

**Table 1**  
**Provisional Ultrasound Diagnosis in Patients Scanned for Suspected Ectopic Gestation**

Provisional Ultrasonic Diagnosis	Number of Cases	Percentage (%)
1. Normal Anatomy of the Reproductive System	3	4.2
2. Normal Intrauterine Pregnancy	15	20.8
3. Ectopic Pregnancy	20	27.7
4. Pelvic Inflammatory disease	5	6.9
5. Tuboovarian mass	6	8.3
6. Ovarian Cyst	12	16.7
7. Fibroid	6	8.3
8. Pelvic Abscess	4	5.6
9. Ectopic Kidney	2	2.8
10. Pancreatic Pseudocyst	1	1.4
11. Ruptured Appendix	1	1.4
12. Psoas Abscess	1	1.4
13. Pyomyositis	1	1.4
14. Pyometria	1	1.4
15. Missed Abortion	1	1.4

## Discussion

The sonographic findings considered to be highly suggestive of an ectopic pregnancy in this series are, the presence of an empty uterus (enlarged or not) with or without decidual reaction, a complex adnexal mass which may contain a foetal echo with or without a heart beat. There may or may not be fluid in the pouch of Douglas. These findings coupled with a missed menstrual period, positive pregnancy test or vaginal bleeding should alert the examiner to the presence of an extrauterine pregnancy. However, one should not be misled even when pregnancy test is negative or menstrual history is uncertain. On the other hand, a positive pregnancy test, adnexal mass and an empty

uterus does not always confirm the diagnosis of an ectopic pregnancy. The importance of clinical history and examination which leads to the suspicion of ectopic pregnancy cannot be overemphasised<sup>6</sup>.

Laing and Brooks<sup>10</sup> showed that a normal viable intrauterine pregnancy essentially excludes the diagnosis of ectopic pregnancy. This has been proven in 20.8% of cases in this series. Marks *et al*<sup>11</sup> confirmed this statement and emphasized the fact that a co-existing intrauterine and ectopic pregnancy is extremely rare. The main value of ultrasound in aforementioned finding is that it excludes the need for surgical intervention in those cases in which the pregnancy is shown to be intrauterine. However, intrauterine fluid collection, pseudo gestational sac which simulates early gestational sacs were seen in 4 (5.6%) of patients in this series. With proper history and clinical findings, it was possible to exclude ectopic pregnancy in all but one case. This false sac might have been due to exfoliation of hyperplastic endometrium and blood clots associated with ectopic pregnancy. Marks *et al*<sup>11</sup> stressed the importance of the presence of the foetal pole to diagnose a normal intrauterine pregnancy especially when an adnexal mass or free fluid is present in the cul de sac. Thus, early intrauterine cyesis was easily excluded by doing a repeat scan after one week in this series. This might have contributed to the low figures of 6.3% obtained in this study, as compared to 20% of ectopic pregnancy that exhibited a pseudogetstional sac in the study by Marks *et al*<sup>11</sup>.

Fourteen of the fifty-two patients who had empty uterine cavities on scanning had decidual reaction and of the former, 7 (58.5%) turned out to have an ectopic gestation. This figure is much higher than those quoted by Lyon and Levi<sup>12</sup>, where only 20% of the ectopic pregnancies had decidual reaction. This might be due to overfilled bladder which compresses otherwise normal gestational sac or over interpretation. Incomplete abortions or blood clots in the uterine cavity might also simulate this condition, and therefore, a proper history and clinical examination might help in coming to a final diagnosis. All these precautions were taken in the present series. Therefore, decidual reaction is one of the prominent features in the diagnosis of an ectopic pregnancy in this series. Forty-six of the fifty-two patients, who had empty uterine cavities, had co-existing extrauterine masses. Only five of the 46 patients had definite fetal echoes, thus confirming ectopic pregnancies in these five patients. An extrauterine gestational sac with a definite fetal pole and decidual reaction was seen in three (8.3%) of the confirmed ectopic pregnancies. This is a little bit higher than the findings obtained by Schoebaum *et al*<sup>7</sup>, in which these features were found in 6.7%. In this

**Table 2**  
**Ultrasonic Signs Detected at Scanning All Patients Suspected to Have Ectopic Pregnancy**

	Number of Cases	Percentage (%)
1. Empty Normal Sized Uterus	20	27.8
2. Empty Bulky uterus	37	51.4
3. Intrauterine Pregnancy	15	20.8
4. Extrauterine Pregnancy with gestational sac	5	8.3
5. Complex Extrauterine Mass	41	55.6
6. Pseudogestational Sac	4	5.6
7. Decidual Reaction	14	19.4
8. Fluid in the Pouch of Douglas	12	16.7
9. Live Extrauterine Fetus	2	2.8
10.Extrauterine Fetus Without Active Fetal Heart	3	5.6

present series 5 (41.7) of the 12 ultrasonically diagnosed ectopic pregnancy displayed some evidence of extrauterine gestation. These figures are less than in that quoted by Cochrane<sup>13</sup>, in which ultrasonography was said to display some evidence of extrauterine gestation in about 50.0% of ectopic gestation. Furthermore, he indicated that the gestational sac will rarely be seen intact outside the uterus and this has been supported by the fact that 16.7% had intact gestational sac outside the uterus in this series.

**Table 3: Operative Findings**

	Number Operated	Number Confirmed at Surgery	Number of Missed Diagnosis
1.Ectopic Pregnancy	12	11	1
2.Ovarian Cyst	5	5	-
3.Fibroid	1	1	-
4.Pelvic Abscess	1	0 (Ectopic Pregnancy)	1
5.Ruptured Appendix	1	1	-
6.Pyomyositis	1	1	-

The uterine size is also quite significant in the diagnosis of ectopic pregnancy in this series; as ten (83.3%) of the finally diagnosed ectopic pregnancies, showed an empty bulky uterus on ultrasound, while two were empty and not bulky. However, one must not forget the fact that there is a considerable individual variation in the size of the uterus, even in a non-gravid uterus<sup>6</sup>. If one however considers the total number of patients scanned and the total number of empty bulky uterus, only 27.0% of patients with empty bulky uterus were finally confirmed to be due to ectopic pregnancy. This is a low figure to be considered crucial for the

diagnosis of ectopic pregnancy. One must therefore consider the size of the uterus with other diagnostic criteria, such as the presence of an extrauterine mass or a gestational sac, and the presence of decidual reaction, before making a definitive diagnosis.

Complex adnexal mass was found in 10 of the cases (83.3%) of confirmed ectopic pregnancies at surgery. This is a high index for a positive diagnosis of ectopic gestation especially when correlated with other findings such as enlargement or displacement of the

**Table 4**  
**Relevant Ultrasonic Findings in Patients With Final Diagnosis of Ectopic Pregnancy**

	Number of Cases	Percentages (%)
Empty Normal Sized Uterus	2	16.7
Empty Bulky Uterus	10	83.3
Extrauterine Pregnancy With Gestational Sac	5	41.7
Pseudogestational Sac	1	8.3
Live Extrauterine Foetus	2	16.7
Extrauterine Foetus Without Fetal Heart Beat	3	25.0
Complex Adnexal Mass	10	83.3
Decidual Reaction	7	58.3
Fluid In The Pouch Of Douglas	6	50

uterus and fluid in the cul de sac. These latter findings can however be found in pelvic inflammatory disease, endometriosis, threatened abortion, missed abortion, torsion and rupture of ovarian cyst<sup>7, 14</sup>. However, the clinical history, findings and results of pregnancy tests helped in elimination of these various conditions. The other adnexal masses in the present series turned out to be ovarian cysts, pelvic abscesses, tuboovarian masses and ectopic kidneys as shown in table 11.



The presence of fluid in the Pouch of Douglas is non-specific as this could occur in both pelvic inflammatory disease and ruptured ovarian cysts. The present series showed that 12 patients in all had fluid in the Pouch of Douglas but only six (50.0%) of these was found to be associated with ectopic pregnancy at operation. This feature is less sensitive for the diagnosis of ectopic pregnancy as similarly quoted by Schoebaum et

al<sup>7</sup>. Also, since it is a late sign which suggests rupture of the tubal pregnancy, one would not want to wait to find such signs before diagnosing an ectopic pregnancy. Other conditions which can cause fluid in the Pouch of Douglas include Pelvic inflammatory disease, ruptured ovarian cysts and ruptured appendix co-existing with pregnancy. Therefore, this ultrasonic sign cannot be considered in isolation but has to be correlated with other sonographic findings.

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