

Sonographic evaluation of induced abortion - experience in Nigeria

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Summary

A sonographic evaluation of forty-six patients with suspected complications of unsafe induced abortion was performed prospectively. The sonographic features were correlated with surgical findings. Based on the sonographic findings, the patients were categorised into three groups. There was no clear association between the severity of sonographic or pathological findings and the time of presentation for ultrasound after the termination of pregnancy, but most of the patients presenting after 5 days belonged to groups II and III, i.e. had uterine complications with or without abdomino-pelvic complications. The commonest complication, sepsis, is variably expressed sonographically in all groups. Although, the sonographic appearances of sepsis are similar to those seen in pelvic inflammatory disease (PID), some features seen with post-abort sepsis are peculiar. Apart from sepsis, other complications of abortion presented non-specific sonographic features. "Pseudouterus" appearance was demonstrated in one patient after hysterectomy. The likelihood of pre-operative diagnosis of uterine perforation is high when the presentation is early before the formation of complex echopatterns of sepsis or in the absence of free intraperitoneal gas from bowel perforation or gas-forming organism. Routing manual vacuum aspiration or therapeutic endometrial curettage is unnecessary where sonography shows no evidence of retained products post abortion.

Keywords: *Abortion, complication, ultrasound*

Résumé

Une évaluation sonographique de quarante-six patients avec des complications suspectés être-due à des avortements malsain et provoqués a été faite de manière prospective. Les caractéristiques sonographiques ont corrélé avec les résultats chirurgicaux. En se basant sur les résultats sonographiques, les patients avaient été catégorisés en 3 groupes. Il n'y avait pas d'association claire entre la sévérité des résultats sonographique ou pathologique, et le temps de présentation du sujet à l'ultrason après l'arrêt de la grossesse, mais la plupart des patients qui s'étaient présentés après le 5 ième jour ont appartenu aux groupes II et III i.e. ont eu des complications utérines avec ou sans complications abdomino-pelviennes. La complication la plus commune étant la septicémie, elle a été variablement exprimée sonographiquement dans tous les groupes.

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Quoique les apparences sonographiques de la septicémie ont été similaires à ceux observés dans les maladies inflammatoires du pelvis (PID), certains traits caractéristiques rencontrés dans les septicémies après l'avortement sont particuliers. Apart la septicémie, les autres complications due à l'avortement ont présentés des caractéristiques non sonographiques. L'apparence du "pseudo uterus" a été démontré chez un patient après l'hystérectomie. La forte probabilité du diagnostic pré-opératoire de la perforation utérine est "élevé" quand la présentation est assez tôt avant la formation des différentes formes de septicémie ou en l'absence de gaz libre intrapéritonéal provenant de la perforation des intestins ou des organismes formant des gaz. L'aspiration manuelle, ou la thérapeutique du curetage endométrique n'est pas nécessaire où la sonographie ne montre pas de preuve de rétention des produits après l'avortement.

Introduction

Induced abortion is one of the commonest causes of morbidity and mortality in Nigeria and other parts of Africa [1,2]. The morbidity and mortality from abortion are almost entirely due to illegally induced abortions which particularly endanger the woman as a result of complications such as trauma, haemorrhage and infections [3,4]. The complication resulting from induced abortion accounts for 20-40% of maternal death [5] and it is also a major cause of secondary infertility.

Previous reports on this subjects [1,2,3,4,5] had emphasised the clinical and socio-economic problems. To the best of the authors' knowledge, the role of ultrasound in the management of this condition is poorly documented in literature in spite of the routine pre-and post-operative sonographic evaluation of these patients. This report describes the sonographic findings in patients with complicated induced abortions and correlates the ultrasound features with surgical findings.

Patients and methods

The ultrasound findings of forty-six patients out of seventy referred for sonography because of suspected complications of induced abortion at the University of Ilorin Teaching Hospital, Ilorin and the Obafemi Awolowo Teaching Hospital Complex, Ile-Ife were compared with surgical findings.

All the patients were examined by the same physician per abdomen using real time ultrasound scanners (Toshiba and Shimadzu) with a 3.5 MHz linear and convex transducers. Satisfactory full urinary bladder was achieved prior to scanning except in a few cases precluded by severe discomfort. In some cases with peritonitis, bladder filling was achieved by intravenous infusion.

The uterus was assessed for size, echotexture and cavity contents. The adnexa and the rest of the pelvis and abdomen was assessed. If fluid was found, the extent, shape, location and the presence of echoes within it were documented. Particular attention was paid

to the areas of maximum tenderness and the underlying pathology was noted.

Excluded from this study were patients with incomplete records and/or poor images.

Results

Forty-six patients were examined sonographically shortly after admission and at convalescence or before discharge. They had a total of 89 scans. The remaining 24 patients were excluded as a result of incomplete records (n = 7).

All had either manual vacuum aspiration (MVA) or minimal therapeutic dilatation of the cervix and blunt curettage of the uterus (D&C) and 13 had laparotomy as result of pelvic collection.

The age range was 18-38 years and a mean of 24 years. The time of presentation for sonography ranged between 1 and 14 days after the attempted termination of pregnancy. The methods of induction are shown in Table 1, D&C being the highest.

Table 1: Methods of induction of abortion

Methods	No
D&C	26
Ingestion of drugs, alcohol, concoction	8
Insertion of pessary	5
Not stated	4
Use of dangerous Instrumentation e.g. pin.	3

Gestational age at termination ranged from 8 to 20 weeks (mean = 14.7 weeks) Two patients died during the course of treatment from endotoxic shock. Based on the sonographic findings, the patients were grouped into 3:

- Group I (n = 18):- Normal uterine appearances with abnormality within the pelvis only. Time of presentation 1- 5 days (mean = 3 days).
- Group II (N = 21):- Abnormal uterine appearances with normal pelvis only. Time of presentation: 3 – 9 days (mean = 5.2 days).
- Group III (N = 8):- Abnormal uterine appearances with abnormality within the pelvis and abdomen. Time of presentation: 3-14 days (mean = 6.3 days).

Group I

Sonographic findings: All the eighteen patients had normal sized uterus with normal specular echotexture. Retroverted uterus was seen in four. Endometrial lining was vaguely demonstrated in eleven patients and not seen in seven. No cervical abnormality was shown. The ovaries were not demonstrable in five.

The pouch of Douglas showed transonic appearance from fluid collection in ten patients and there was localised fluid with medium amplitude echoes around the uterus in eight Fig.1. The possibility of a sealed-off uterine perforation was raised in three in which the collections were localised to a focal aspect of the uterine wall. No adnexal masses or intra-abdominal lesions were seen in this group of patients.

Surgical findings: All the patients had MVA or minimal blunt endometrial curetting which yielded no product of conception. At laparotomy, the eight patients with fluid containing debris revealed thick foul smelling abscess walled by omentum.

Matted guts were seen in three patients. The ovaries and tubes were matted to the pelvic wall in 12 patients, which included the five in which the ovaries were not demonstrable on ultrasound.

Perforations were seen in three patients; two of which were suggested by sonographic finding's as described above.

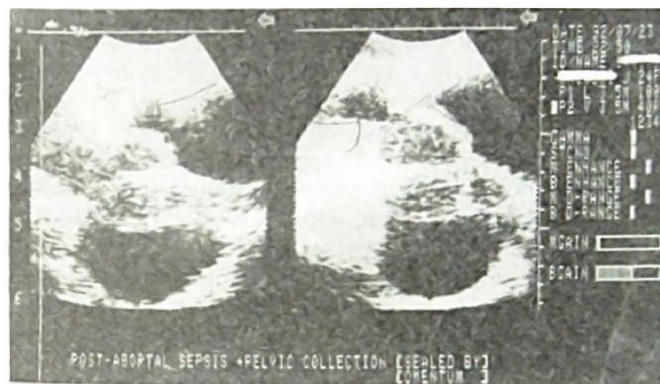


Fig. 1: Longitudinal scans showing normal sized, slightly retroverted uterus. There is fluid collection in the pouch of Douglas and localised fluid over the anterior uterine wall. Note the fluid/medium amplitude echo interface of the anterior collection from localised abscess.

Group II

Sonographic findings: In this group, all the patients had retained products and the uterus presented varying echotexture.

The retained products presented as:

- (i) thick echogenic intruterine structures in 15 patients
- (ii) thick echogenic intrauterine structures with associated posterior pseudo-acoustic shadows from gas in 6 patients (Fig. 2).



Fig. 2 Transverse and longitudinal ultrasound scans showing hypoechoic uterine wall. The uterus contains thick echogenic structures from retained products of conception, associated with a beam of posterior pseudo-acoustic shadows from gas from gas-producing organism

The uterus was moderately bulky in all, with 12 patients showing hypoechoic appearance, 6 mild to moderate bright echotexture and 3 normal echopattern.

Surgical findings: None had laparotomy, but suction evacuation and minimal endometrial curettage was performed. This yielded copious products of conception. Products mixed with altered blood in 7, with clots in 5 and with active bleeding in 3. Cervical laceration with haemorrhage was seen in 3 at evacuation.

Group III

Sonographic findings: This group shows varying uterine, pelvic and abdominal abnormalities.

Three patients showed a bulky bright uterus, intrauterine echogenic structures from retained products of conception with pseudo-acoustic shadows from gas. There was clear fluid in the pelvic cavity with an incidental finding of a pelvic kidney in one of these patients (Fig. 3a) while the remaining 2 showed thick, short echoes within the pelvic fluid (Fig. 3b), probably due to early loculation of abscess.

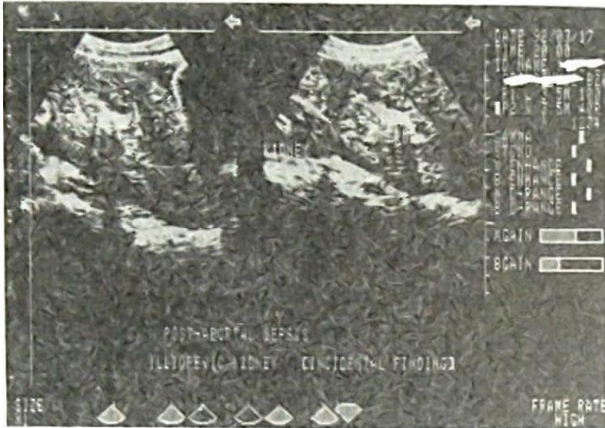


Fig. 3a Longitudinal ultrasound scans showing a bulky, brightly echogenic uterus. There is a thick, intrauterine, echogenic structure with a thin halo of fluid, from retained products of conception, accompanied by thin, linear posterior acoustic shadows. Note the presence of a pelvic kidney (incidental finding) posterior to the uterine fundus and minimal clear fluid around the uterus.

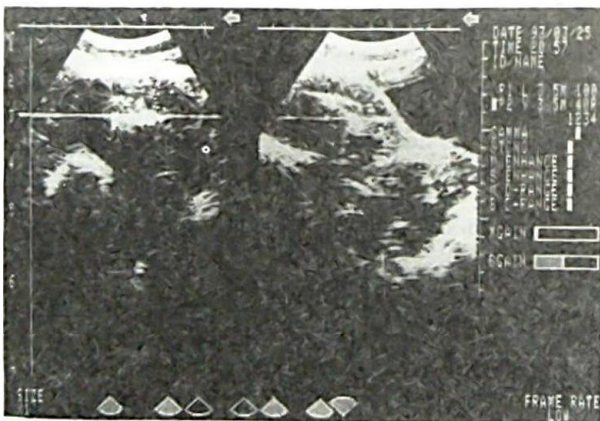


Fig. 3b Transverse and longitudinal scans showing localised fluid with thick short echoes in the pouch of Douglas. Note the presence of intrauterine retained products of conception with a weak posterior pseudo-acoustic shadow and a moderately bright uterine wall.

The uterus was partially obscured by extensive pelvic and abdominal fluid collection which contains fine echo debris in one patient (Fig. 3c) while most of the central abdominal and pelvic contents were completely obscured by a beam of pseudoacoustic shadows arising immediately underneath peritoneal surface in 2 patients. (Fig 3d).

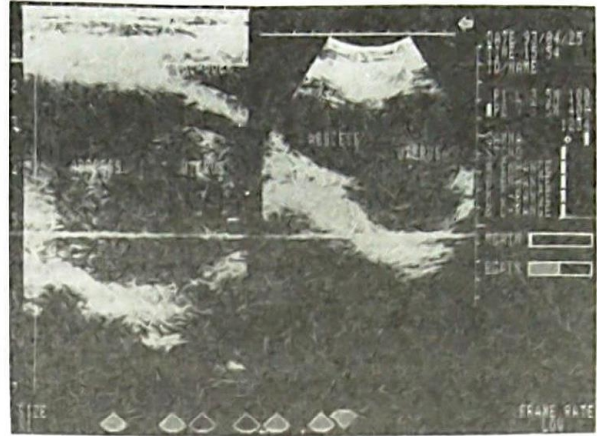


Fig. 3c Longitudinal (mid-line and right paramedian) scans showing an extensive pelvic and abdominal abscess in which there is a fluid/debris interface. The uterus is partially obscured.

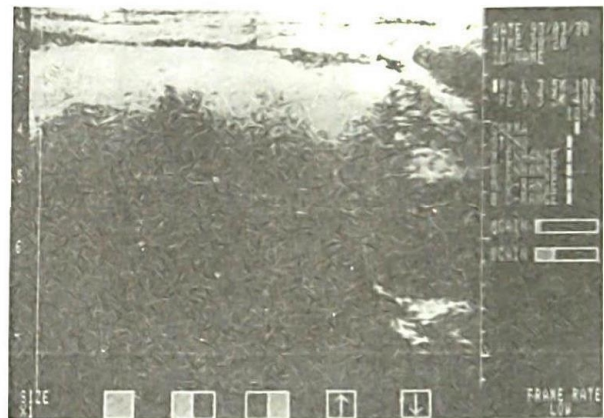


Fig. 3d Composite longitudinal scan of the abdomen and pelvis in a patient with omental cake, showing anterior brightness with wide beam of posterior pseudo-acoustic shadows. The uterus and central abdominal structures are obscured by the acoustic shadows. Note the clear fluid in the pouch of Douglas.

The two patients with a brightly echogenic and bulky uterus also demonstrated adnexal masses (Fig. 3e). The adnexal masses were oval, sonolucent and contained short, thick internal echoes. The walls were thick and in layers. Areas of intense focal tenderness were elicited over these masses.

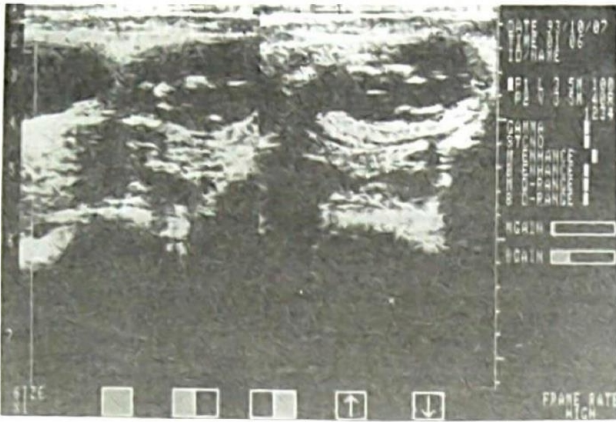


Fig. 3e Transverse pelvic scans of adnexal mass showing an oval sonoluscent appearance, containing short thick internal echoes. The wall of the mass is in layers posteriorly, from omentum and collapsed bowel walls

Hypoactive bowel movements were seen in all except in the patient (Fig. 3d) in which the abdomen and uterus were obscured.

Perforation of the uterus was suggested in patients with localised suprabubonic dilated loops of small bowels overlying the uterine fundus. Ovaries were not demonstrable in any patient.

Surgical findings: Blunt endometrial curetting yielded copious retained products of conception with altered haematoma in patients with products as suggested by ultrasound.

Three patients presented with endotoxic shock and all had brightly echogenic uteri, containing retained products on ultrasound (Fig. 3). Two of them died.

Laparotomies were performed in all except in patients with endotoxic shock. Intra-abdominal and pelvic abscesses were found in all cases. Inability to demonstrate ovaries on ultrasound was as a result of the congestion and adhesions between the tubes, ovaries and bowels as revealed at surgery in all cases.

Perforations were sealed off by adhesions and masses of purulent collections in 3 patients; one of which was suggested at ultrasound.

Complete seal-off of the abdomen by necrotic omental cake was revealed in the patient in which the abdomen and pelvis were completely obscured on ultrasound (Fig. 3d). Perforations of the uterus, ileum and sigmoid colon, fetal parts, pelvic abscess, extensive adhesions and subphrenic fibrinoid exudates were the underlying pathologies in this patient. Hysterectomy was performed in this case because of the ragged and necrotic perforation of the uterus.

Post operative sonographic findings (after one week).

Group I: Normal uterus. No pelvic fluid in 12 cases, but residual traces were seen in 5. Endometrial lining remained vaguely demonstrated in all cases. Ovaries were seen in 10.

Group II: Normal uterus with poor endometrial lining in 18 patients. Minimal intrauterine fluid in 3. Normal-sized

uterus in all. Normal echotexture in 14 and moderately reduced echotexture in 7.

Group III: All had residual minimal fluid in the pelvis. The surviving patient with endotoxic shock showed moderately bulky uterus but normal echotexture. "Pseudo-uterus" appearance was seen in post-hysterectomy patient (Fig. 4). The remaining patients showed normal uterine appearances. Normal bowel movement with traces of intra peritoneal fluid were demonstrated.

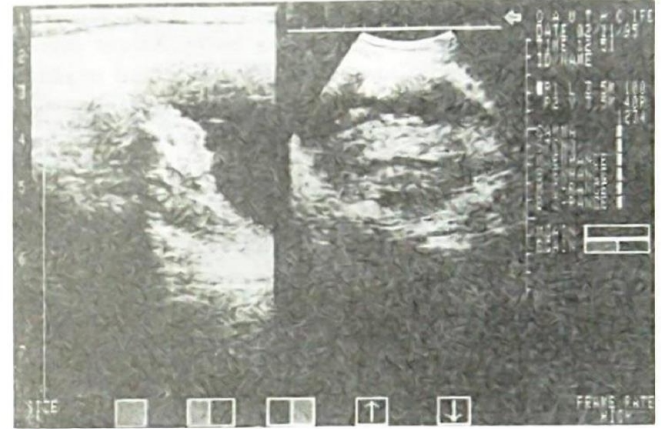


Fig. 4 Longitudinal and transverse pelvic scans after hysterectomy, showing "pseudo-uterus" appearance. Note the thickened posterior bladder wall.

Discussion

This series shows that sonography is of value in the management of induced abortion by way of detecting complications and planning appropriate management. From this report, sonography is of immense value in the management of intrauterine and intraperitoneal sepsis. Complications such as uterine or bowel perforations, cervical lacerations and haemorrhage showed non-specific findings. Most of these findings are merely suggestive or predictive.

Sepsis remains the commonest cause of morbidity and mortality in women after termination of pregnancy. Although D&C tops the list, not all the abortion methods predispose the patients to infection [5].

There is no clear association between the severity of sonographic or pathologic findings and the time of presentation for sonography after termination of pregnancy. The trend as shown in this series however shows that most of the patients presenting after 5 days belong to groups II and III, i.e. had the tendency to show uterine complications with or without abdomino-pelvic complications.

The sonographic findings of post-abort sepsis in this study are similar to those seen in PID [6]. However, these sonographic findings show some peculiarities not seen in PID. The presence of retained products of conception with or without gas from gas-forming organisms, seen mainly on groups II and III is distinctive. This, however, needs to be differentiated from post-partum sepsis by the clinical history.

Hypochoic appearances of the uterus in most cases are related to changes of acute endometritis (6). Increased echogenicity with retained products of conception are peculiarities noticed in these patients might be related to the presence of gas within the myometrium. The poor definition or absence of endometrial lining in group I is part of the changes of endometritis and could also have resulted from the removal of the endometrium by D&C.

Extensive involvement of the abdomen in this series emphasises the value of sonography in determining the extent of surgical intervention required after pre-operative antibiotics. Of note are the two cases in group III (Fig. 3), in which there were abdominal and pelvic abscess, collections and adhesions, bowels perforation and total seal-off of the rest of the abdomen from the pathology. The inability to visualise the abdominal contents in the patients with omental cake was due to extensive intraperitoneal gas partly from the gas-forming organisms and perforated bowels.

Also, the incidental finding of pelvic kidney in one of the patients (Fig. 3a) emphasises the point that indiscriminate pre-imaging attempt at incision into a vague mass could be dangerous.

Perforation of the uterus showed non-specific sonographic appearances. It is obvious from this study that the likelihood of making a reasonable diagnosis of perforated uterus is high when patients present early before the development of complex echopatterns from infection or in the absence of free peritoneal gas. The suggestion perforation by the presence of small localised fluid collection against a particular part of the uterine wall or the appearance of a floating membrane in which a portion of it is attached to the uterine wall in the presence of clear pelvic fluid, are only positive in three out of the six seen on ultrasound. The undetected perforations are not unconnected with the complex nature of the echopatterns of the pathology more importantly where there is surrounding free peritoneal gas.

The 3 cases of cervical lacerations in which haemorrhage was one of the main clinical indications for sonography were not detected sonographically as a result of the complex echopattern of the pelvic collections and/or retropubic position of the cervix. Other causes of haemorrhage following abortion are related to uterine perforation, lacerations and bleeding from the raw endometrial surface with or without infected retained products. The latter are identified by the presence of haematoma with or without products of conceptions as echogenic structures within the uterine cavity and confirmed after curettage or suction evacuation.

Routine manual vacuum aspiration performed to evacuate possible remnants of the product of conception, is the standard practice in the management of complicated abortion, but where this is not available as it was in some of our cases, minimal blunt endometrial curettage is performed. From this series, it is clear that not all the patients should be subjected to this procedure as the procedure in all the 18 patients group I where the endometrial linings were either not visible or vaguely visible yielded no products of conception. This act may

further denude the remaining endometrium or decidua, thereby exposing the patients to the risk of possible severe uterine synechae. Apart from being cheaper, MVA is not likely to expose the patients to this risk.

Post-operative sonography plays a valuable role in excluding residual changes and monitoring recovery as illustrated in this series. The pseudo-uterus appearance [6] seen post-hysterectomy in one of the cases could be explained by the presence of a small fluid walled-off by small loops of bowels postero-superiorly and thickened vesical wall anteriorly.

In conclusion, the role of accurate pre-operative sonographic assessment of the pelvis and abdomen has an important role in the management of abortion and its complications. Apart from sepsis, other complications present non specific sonographic features. However, the likelihood of pre-operative diagnosis of uterine perforation is high when the presentation is early before the formation of complex echopatterns of sepsis or in the absence of free peritoneal gas from bowel perforation or gas-forming organisms. Routine therapeutic endometrial curettage is unnecessary in post-abortion patients where sonography shows no evidence of retained products.

Where abortion is considered illegal as is the case in Nigeria, it is imperative to train and re-train physicians in management of abortion [7] in order to stem the occurrences and/or severity of these complications.

References

1. Akingba JA Abortion, mortality and other health problems in Nigeria. *Nigerian Medical Journal*. 1997 - 7; 465 - 471.
2. Ojo OA Septic abortion in Ibadan. A ten year review of cases. *West African Medical Journal*, 1978; 51, 19-24.
3. Omu AE Orosanye AU, Faal MK, Asuquo EE, Adolescent induced abortion in Benin-City, Nigeria. *International Journal of Obstetrics and Gynaecology*, 1981 - 191; 495-499.
4. Unuigbo JA, Orosanye AU, Orhue, AAE Preventable factors in abortion related mortality in Africa. Focus on abortion death in Benin-City, Nigeria. *Tropical Journal of obstetrics and Gynaecology (Special edition)* 1985; 1, 36-38.
5. Okonfua FE, Onwudiegwu U, Odunsi OA Illegal induced abortion: a study of 74 cases in Ile-Ife, Nigeria. *Tropical Doctor*. 1992; 22: 75-78.
6. Swayne LC, Love MB, Karosick JR Pelvic inflammatory disease: Sonographic pathologic correlation. *Radiology* 1984; 151: 751-753.
7. Ladipo OA: Preventing and managing complications of induced abortion in third world countries. *International Journal of obstetrics and Gynaecology* 1989; Suppl. 3 21-28.