

# Ultrasonographic Characteristics in Patients Clinically Diagnosed with Threatened Abortion

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**Objective:** To determine ultrasonographic appearances in pregnant women clinically diagnosed with threatened abortion.

**Design:** Cross-sectional study

**Material and Method:** Seven hundred and seventy six pregnant women clinically diagnosed with threatened abortion and receiving ultrasonographic examination were enrolled. Data on ultrasonographic characteristics were obtained from records at the Maternal-fetal Medicine unit. Pregnancy outcomes were reviewed from medical records.

**Results:** The ultrasonographic findings demonstrated 328 (42.3%) viable pregnancy, 178 (22.9%) embryonic death, 176 (22.7%) anembryonic pregnancy, 25 (3.2%) incomplete abortion, 24 (3.1%) complete abortion, seven (0.9%) molar pregnancy, four (0.5%) ectopic pregnancy, and 34 (4.4%) inconclusive finding. Two hundred and sixty viable pregnancies were available for follow-up and revealed that 229 (88.1%) eventually delivered while 31 (11.9%) ended up with abortion. The two groups were not significantly different regarding age, parity, history of abortion, and gestational age at diagnosis.

**Conclusion:** Ultrasonographic findings in patients clinically diagnosed with threatened abortion demonstrated viable pregnancy in nearly half of the cases. Transvaginal ultrasonography is useful in establishing definite diagnosis and appropriate treatment among these patients.

**Keywords:** Threatened abortion, Transvaginal ultrasonography

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Threatened abortion is a common occurrence that complicates at least a quarter of clinical diagnosed pregnancy<sup>(1,2)</sup>. Different types of miscarriage and early pregnancy failure along with ectopic pregnancy and gestational trophoblastic disease account for the bulk of early pregnancy problems. The management of early pregnancy bleeding had been overhauled, moving away from in-patient care to out-patient care with same- or next-day elective surgical treatment or alternatively medical and conservative management options<sup>(1,2)</sup>. This change has been principally brought about through the establishment of early pregnancy assessment by ultrasound scanning.

Ultrasonography allows earlier and detailed visualization of the gestational sac in normal developing intrauterine pregnancy<sup>(3)</sup>. This is followed by embryonic pole, which can be first recognized as a thickening along the yolk sac. The primitive heart is early prominent, and cardiac activity can often be detected before the embryo itself<sup>(4)</sup>. Thus, currently, ultrasonography plays a major role in establishing the presence of normal live intrauterine pregnancy. Information obtained from ultrasonographic evaluation among patients who have abnormal bleeding during early pregnancy is helpful for caring physicians to better manage and counsel the patients and their families. It also helps in the decision-making process to provide appropriate care to these patients.

The aim of the present study was to evaluate sonographic characteristics of patients clinically diagnosed with threatened abortion and their pregnancy

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outcomes. The results could be useful as additional information in managing women clinically diagnosed with threatened abortion.

### Material and Method

A cross sectional retrospective study was conducted among women clinically diagnosed with threatened abortion and received ultrasonographic examination at the Maternal-Fetal Medicine unit, Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital from January 2002 to December 2004. Seven hundred and seventy six patients were enrolled. Threatened abortion was diagnosed based on history of missing menstrual period, vaginal bleeding, and closed cervix on pelvic examination done by residents or obstetricians<sup>(1,2)</sup>. Exclusion criteria were patients who had induced abortion, those with underlying chronic diseases such as cardiovascular, renal diseases, and those with unstable vital signs. The ultrasonographic scans were performed by experienced staff at the Maternal-Fetal Medicine unit. The ultrasonographic machine used was LOGIC TM 3 Models GE Medical System Thailand td with 5 MHz vaginal transducers.

All the ultrasonographic diagnoses were made by experienced staff using similar standard criteria<sup>(4)</sup>. Blighted ovum was diagnosed when there was no visible embryo in mean gestational sac measuring > 17 mm. Embryonic death was diagnosed when there was significant visual fetal part (CRL > 5 mm) with no fetal heartbeat. Incomplete abortion was defined as retained product of conceptus tissue in uterine cavity confirmed by pathological report in subsequent curettage. Complete abortion was defined as empty uterine cavity without adnexal mass or significant free fluid in cul-de-sac in women with a history of pregnancy, bleeding, and abdominal pain. Inconclusive finding was defined as sonographic findings that did not fit the above criteria.

Data were abstracted from medical and ultrasonographic records, including baseline characteristics, obstetric data, and ultrasonographic characteristics at diagnosis. Pregnancy outcomes were also determined if their pregnancies ended up with abortion or delivery.

Descriptive statistics, including mean, standard deviation (SD), number and percentage, were used to describe baseline, obstetric and ultrasonographic data. Comparison was made between various factors and pregnancy outcomes. Student's t-test and Chi-square test or Fisher's exact test were used as appropriate. Statistical significance was considered if p value was < 0.05.

The present study was reviewed and approved by the Ethics Committee, Faculty of Medicine Siriraj Hospital, Mahidol University.

### Results

Seven hundred and seventy six patients clinically diagnosed with threatened abortion were enrolled between January 2003 and December 2004. Table 1 shows baseline characteristics of all participants. Mean maternal age was  $28.6 \pm 6.4$  years and mean gestation age was  $10.6 \pm 2.8$  weeks. Majority (58.1%) was primipara and 23.5% had history of previous abortion.

Table 2 shows ultrasonographic findings of 776 women. The results showed that 42.3% were viable pregnancies, 22.7% were blighted ovum, 22.9% were embryonic death, 3.2% were incomplete abortions, and 3.1% were complete abortions. Ectopic and molar pregnancies were found in only 0.5% and 0.9% respectively. Inconclusive findings were reported in 4.4% of cases.

Pregnancy outcomes were compared between those with viable pregnancies and inconclusive findings and the results are shown in Table 3. The outcomes were available in 260 viable pregnancies and 29 inconclusive findings. Those with inconclusive findings ended up with a significantly higher abortion

**Table 1.** Demographic data of 776 patients clinically diagnosed with threatened abortion

Demographic data	n = 776
Mean maternal age $\pm$ SD	28.6 $\pm$ 6.4 years
Mean gestational age $\pm$ SD	10.6 $\pm$ 2.8 weeks
Primipara	451 (58.1%)
Previous abortion	182 (23.5%)

**Table 2.** Ultrasonographic findings of 776 patients clinically diagnosed threatened abortion

Sonographic findings	Number	Percentage
Viable pregnancy	328	42.3
Blighted ovum	178	22.9
Embryonic death	176	22.7
Incomplete abortion	25	3.2
Complete abortion	24	3.1
Ectopic pregnancy	4	0.5
Molar pregnancy	7	0.9
Inconclusive	34	4.4

rate than those with viable pregnancies (82.8% and 11.9% respectively,  $p < 0.001$ ).

Two hundred and sixty pregnancy outcomes were available for further analysis. Of these, 229 delivered eventually (88.1%). Table 4 shows pregnancy outcomes with regard to various maternal characteristics. No statistical difference was found between the rate of delivery and maternal age, parity, history of previous abortion, and gestational age at diagnosis. However, it should be noted that there was a slightly higher rate of pregnancy that ended up with delivery if gestational age at the diagnosis of threatened abortion was  $> 12$  weeks compared with those  $\leq 12$  weeks (95.8% and 87.2% respectively).

### Discussion

Threatened abortion is a common complication during early pregnancy that can cause anxiety for the patients and their family and uncertainty of their physicians. In such circumstances, ultrasonographic examination is valuable and helpful in the decision for

appropriate management. The demonstration of fetal life is reassuring and can help to guide further management. Accurate diagnosis of the nature of pregnancy (viable or non-viable) can avoid inappropriate treatment and prolonged, unnecessary hospitalization. It also indicated the need for uterine curettage by diagnosing retained product in uterine cavity or prompting to operate a life-threatening condition such as ectopic pregnancy<sup>(5)</sup>.

The results of the present study showed that in patients clinically diagnosed with threatened abortion, 42.3% were viable pregnancies. This rate was comparable to those reported by Everett<sup>(6)</sup> (48%) and by Schauburger<sup>(7)</sup> (44%). Ectopic and molar pregnancies were found in only four cases (0.5%) and seven cases (0.9%) respectively. All of these women further received appropriate investigation and treatment. This emphasizes the value of having ultrasonographic examination in these patients since it could lead to appropriate and prompt treatment to reduce morbidity and mortality from missing the diagnosis of an emergency condition.

While 88.1% of viable pregnancy eventually delivered, only 17.2% of those with inconclusive findings did so. It is possible that there might be some abnormalities among these pregnancies but timing of ultrasonographic examination was too early to identify such conditions or some suspicious findings still did not meet the diagnostic criteria<sup>(4)</sup>.

Of 260 pregnancies that pregnancy outcomes were available, the authors found that 88.1% eventually delivered and 11.9% ended up with miscarriage. Basama<sup>(8)</sup>

**Table 3.** Pregnancy outcomes of viable pregnancies and inconclusive findings from ultrasonographic examination

Outcomes	Viable (n = 260) n (%)	Inconclusive (n = 29) n (%)	p-value
Abortion	31 (11.9%)	24 (82.8%)	<0.001
Delivery	229 (88.1%)	5 (17.2%)	

**Table 4.** Relationship between clinical characteristics and pregnancy outcomes in 260 patients with viable pregnancy

Clinical characteristics	Abortion, n (%)	Delivery, n (%)	p-value
Age (years)			NS
<19	3 (14.3)	18 (85.7)	
20-34	22 (11.2)	174 (88.8)	
$\geq 35$	6 (14.0)	104 (86.0)	
Parity			NS
0	21 (12.6)	146 (87.4)	
$\geq 1$	10 (10.8)	83 (89.2)	
History of abortion			NS
0	24 (12.4)	170 (87.6)	
$\geq 1$	7 (10.6)	59 (89.4)	
Gestational age at diagnosis			NS
$\leq 12$	30 (12.8)	205 (87.2)	
$> 12$	1 (4.2)	23 (95.8)	

NS = by Chi-square test

reported that 14.3% of miscarriages associated with increased maternal age and Tanirandorn<sup>(9)</sup> reported 3.4% of miscarriages in this viable group at gestational age between 6-14 weeks. Women whose pregnancies continued and eventually delivered, clinical parameters such as maternal age, gestational age at diagnosis of threatened abortion, parity, and previous abortions were not statistically significantly different from those who later aborted. Tonsong<sup>(10)</sup> reported that first trimester bleeding with visible fetal heartbeat associated with a subsequent abortion rate significantly higher than the control group. Weiss<sup>(11)</sup> demonstrated that threatened abortion associated with complications of pregnancy such as preterm delivery, preterm PROM, IUGR and placenta abruption.

There were some limitations in the present study due to retrospective nature of data collection. Inter- and intraobserver variability was not initially evaluated. However, all the ultrasonographic diagnoses were made by experienced staff using similar standard criteria. Photographic evidence was not available to confirm the diagnosis. The diagnosis was based on the experience of sonographers only. Those with inconclusive findings were scheduled for follow up examinations in 1-2 weeks before final diagnoses were made. In addition, there were some missing data due to incomplete medical records in some cases. However, all data were verified and additional information was obtained from the database at the Maternal-Fetal Medicine unit. Moreover, pregnancy outcomes could not be determined among those who were lost to follow-up. Therefore, interpretation of the present study results should be made with caution.

In conclusion, ultrasonography especially with the vaginal transducer can help to establish type of pathology in early pregnancy complications and suggested viable pregnancy rate for counseling patients clinically diagnosed with threatened abortion. This investigation should be viewed as an extension of pelvic examination and not substituted for obstetric history and clinical examination. Further longitudinal study will be necessary to understand the clinical course and natural history of this condition that will provide more useful information for better patient

counseling and physician decision-making process.

## References

1. Tamizian O, Arulkumaran S. Bleeding in early pregnancy. *Curr Obstet Gynaecol* 2004; 14: 23-33.
2. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Glistrap L, Wenstrom KD. *Williams obstetrics*. 22<sup>nd</sup> ed. New York: McGraw-Hill; 2002: 232-83.
3. Weston MJ, Dewbury K, Meire H, Cosgrove D, Farrant P. *Ultrasound in obstetrics and gynaecology*. 2nd ed. London: Churchill Livingstone; 2001: 151-78.
4. Tongsong T. Abnormal ultrasonographic findings in first trimester. In: Tongsong T, editor. *Obstetric ultrasonography*. Bangkok: PB Foreign Book Center; 2000: 20-72.
5. Iyer LJ, Bhattacharya M. Role of ultrasonography in early pregnancy complications. *J Postgrad Med* 1992; 38: 115-6.
6. Everett CB, Preece E. Women with bleeding in the first 20 weeks of pregnancy: value of general practice ultrasound in detecting fetal heart movement. *Br J Gen Pract* 1996; 46: 7-9.
7. Schauburger CW, Mathiason MA, Rooney BL. Ultrasound assessment of first-trimester bleeding. *Obstet Gynecol* 2005; 105: 333-8.
8. Basama FM, Crosfill F. The outcome of pregnancies in 182 women with threatened miscarriage. *Arch Gynecol Obstet* 2004; 270: 86-90.
9. Tannirandorn Y, Sangsawang S, Manotaya S, Uerpairojkit B, Samritpradit P, Charoenvidhya D. Fetal loss in threatened abortion after embryonic/fetal heart activity. *Int J Gynaecol Obstet* 2003; 81: 263-6.
10. Tongsong T, Srisomboon J, Wanapirak C, Sirichotiyakul S, Pongsatha S, Polsrisuthikul T. Pregnancy outcome of threatened abortion with demonstrable fetal cardiac activity: a cohort study. *J Obstet Gynaecol* 1995; 21: 331-5.
11. Weiss JL, Malone FD, Vidaver J, Ball RH, Nyberg DA, Comstock CH, et al. Threatened abortion: a risk factor for poor pregnancy outcome, a population-based screening study. *Am J Obstet Gynecol* 2004; 190: 745-50.

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## ลักษณะทางคลินิกเสียงความถี่สูงที่ตรวจพบในผู้ป่วยภาวะแท้งคุกคามที่ได้รับการวินิจฉัยทางคลินิก

ดิฐกานต์ บริบูรณ์หิรัญสาร, สุวรรณิ บุรณวัฒนาโชค

**วัตถุประสงค์:** เพื่อศึกษาลักษณะคลื่นเสียงความถี่สูงในสตรีที่ได้รับการวินิจฉัยทางคลินิกเป็น ภาวะแท้งคุกคาม และผลของการตั้งครรภ์

**ชนิดของการวิจัย:** การวิจัยแบบตัดขวาง

**สถานที่ทำการวิจัย:** หน่วยเวชศาสตร์มารดาและทารก โรงพยาบาลศิริราช

**วัสดุและวิธีการ:** หญิงตั้งครรภ์ที่ได้รับการวินิจฉัยทางคลินิกว่ามีภาวะแท้งคุกคามและได้รับการตรวจด้วยคลื่นเสียงความถี่สูงทางช่องคลอดที่หน่วยเวชศาสตร์มารดาและทารกในช่วงวันที่ 1 มกราคม พ.ศ. 2546 – 30 ธันวาคม พ.ศ. 2547 ทำการเก็บข้อมูลของลักษณะและผลการตรวจคลื่นเสียงความถี่สูงและติดตามผลลัพธ์ของการตั้งครรภ์

**ผลการศึกษา:** หญิงตั้งครรภ์ที่ได้รับการวินิจฉัยทางคลินิกว่าเป็นแท้งคุกคาม 776 ราย พบครรภ์ตัวอ่อนมีชีวิต 328 ราย (ร้อยละ 42.3) ครรภ์ตัวอ่อนเสียชีวิต 178 ราย (ร้อยละ 22.9) ครรภ์ไม่มีตัวอ่อน 176 ราย (ร้อยละ 22.7) แท้งไม่ครบ 25 ราย (ร้อยละ 3.2) แท้งครบ 24 ราย (ร้อยละ 3.1) ครรภ์ไหลรก 7 ราย (ร้อยละ 0.9) ครรภ์นอกมดลูก 4 ราย (ร้อยละ 0.5) ผลการตรวจที่ไม่สามารถสรุปได้ 34 ราย (ร้อยละ 4.4) ผลการตั้งครรภ์ในตัวอ่อนที่มีชีวิต 260 ราย สามารถดำเนินการตั้งครรภ์จนคลอด 229 ราย (ร้อยละ 88.1) แท้งบุตร 31 ราย (ร้อยละ 11.9) โดยทั้งสองกลุ่มไม่มีความแตกต่างกันในเรื่องของ อายุ ประวัติการคลอดบุตร ประวัติการแท้งบุตร อายุครรภ์เมื่อได้รับการตรวจวินิจฉัย

**สรุป:** ผลการตรวจคลื่นเสียงความถี่สูงในสตรีตั้งครรภ์ที่ประสบภาวะแท้งคุกคาม พบเป็นการตั้งครรภ์ตัวอ่อน มีชีวิตประมาณครึ่งหนึ่ง ในจำนวนนี้พบอัตราการคลอดร้อยละ 88.1 การใช้คลื่นเสียงความถี่สูงในสตรีที่ประสบภาวะแท้งคุกคามจะช่วยในการวินิจฉัยและดูแลผู้ป่วยได้อย่างเหมาะสม

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