

618.39-073

## Role of Ultrasound in Evaluation of Empty Gestational Sac Before Threatened Abortion

AHMED MOUSTAFA OUF, M.D.

*The Radiology Department, Faculty of Medicine,  
El Azhar University.*

---

### Abstract

Threatened abortion occurs during the first 20 weeks of pregnancy when vaginal bleeding is encountered with closed cervical os. This occurs in 20 to 52% of pregnancies. Ultrasound provides a simple and unique method of visualising pregnancy in early stages. If the viability of pregnancy can be accurately determined a more active line of management can take place. Nonviable pregnancies are managed by uterine evacuation whereas viable pregnancies are observed.

### Introduction

**THE** major concern after diagnosis of empty gestational sac before abortion is whether or not the pregnancy is viable. The role of ultrasound in such evaluation and subsequent management is studied in this work.

### Material and Methods

Over a two year period, 100 patients presenting with threatened abortion were referred to ultrasound department. Patients were examined using 3.5 MHz sector transducer. Of patients referred 30 (30%) were shown to have empty gestation sac.

Ultrasound appearance of these empty sacs was evaluated with respect to size, shape, wall definition, position in the uterus and decidual reaction around the sac.

The viability of the gestational sac was determined; if follow-up ultrasound examinations demonstrated live fetus, or growing sac versus appropriate age, and also based on the outcome of clinical records indicating successful pregnancies. On the other hand nonviability was considered if subsequent ultrasound examination demonstrated absent growth or absent of embryo parts or spontaneous abortion.

### Results

Of the 30 empty gestational sacs that underwent ultrasound evaluation only 5 (16.6%) were viable. All viable gestation sacs were less than 26 mm in diameter and all had well established decidual reactions greater than 2 mm in width.

All viable gestation sacs had regular or oval shapes of distortion of shape and disruption of the wall of sac. Poor or absent decidual reaction was present in most cases. No low lying gestational sacs are shown to be viable.

Ultrasound appearances of the viable gestation sac are summarised in table 1.

The majority of empty sac 25 cases (83.3%) were found to be non-viable.

All empty sacs with diameters greater than 26 mm, were sacs with high incidence

of distortion of shape and disruption of the wall of sac. Poor or absent decidual reaction was present in most cases. No low lying gestational sacs are shown to be viable.

Sonographic features of gestational sac subsequently shown to be non-viable are summarised in table (2).

Table (1) : Ultrasound Appearances of Viable Empty Gestation Sac.

Viable gestation Sacs (16.6%)		No.	%
Size	< 26 mm	5	100%
Shape	Round / Oval	5	100%
	Deformed		
Decidual Reaction	> 2 mm	5	100%
	< 2 mm	0	
	Absent	0	
Position	Fundal-miduterine	5	100%
	Low	0	

Table (2) : Ultrasound Appearances of non-viable Gestation Sacs.

Non-viable gestation Sacs : (83.3%)		No.	%
Size	23 - 64 mm	25	100%
Shape	< 26		
	Rounded - Oval	0	
	Deformed	25	100%
Wall	Intact	0	
	Disrupted	25	100%
Decidual Reaction	> 22 mm	0	
	> 22 mm	20	66%
	Absent	5	33.4%
Position	Fundal-Mid Uterine	0	
	Low	25	100%

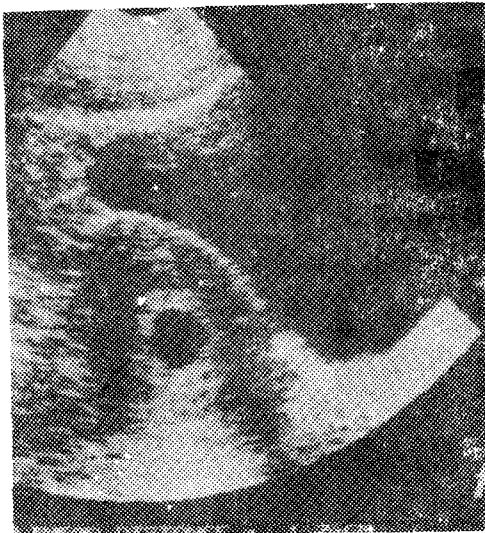
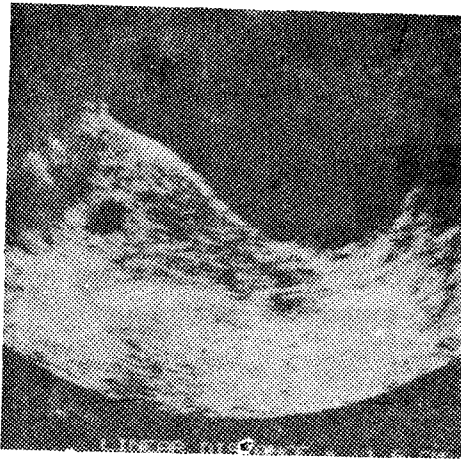


Fig. 1. & 2. Longitudinal scans showing viable gestation sac with normal sonographic features including : Round shape, smooth contour and prominent decidual reaction.

**Discussion**

If an embryo cannot be identified the differentiation of viable from non-viable pregnancies is not always straight forward [1]. When presented with empty sac the sonographer can use certain criteria in an

attempt to distinguish a normal pregnancy from blighted ovum.

Size was found to be the most important criterion in determining the non-viability of empty sac.

No empty sac with diameter greater than 23 mm was shown to represent a viable pregnancy in our series. This is similar to the findings of others [2,3].

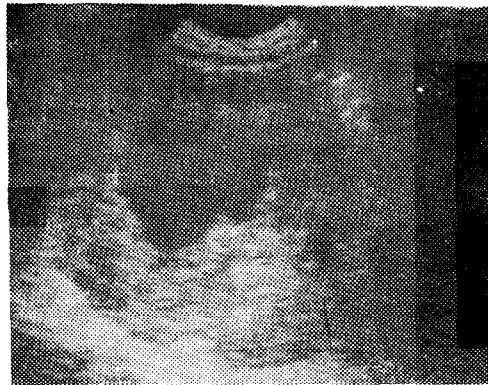


Fig. 3. Transverse scan : Abnormal gestational sac (31 mm) irregular shape, absent decidual reaction.

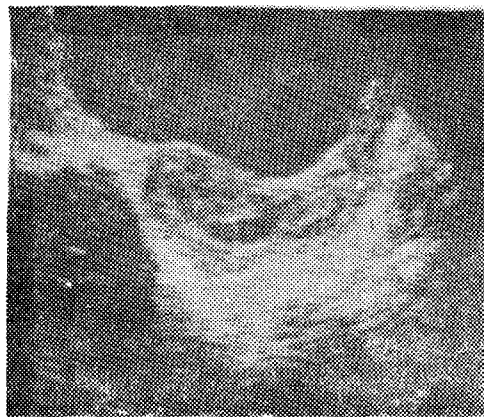


Fig. 4. Longitudinal scan : Abnormal gestational sac, large size (48 mm diameter), irregular outline, poor decidual reaction.

Distortion of the sac also showed close correlation with non-viability. It has been suggested that a distorted sac is 100% specific for non-viability[3].

A continuous decidual (Trophoblastic) reaction measuring more than 2 mm in width was present in all viable gestation sacs. No gestation sac without surrounding reaction was found to be viable this contrasts with the findings of Bernard and Cooperberg[2].

A low implantation site in the uterus might have higher effects in abortion rates. The reason for this is uncertain but it has been suggested that low implantation in presence of bleeding and open cervix carries poor prognosis[1].

#### *Conclusion :*

Using ultrasound, normal gestational sac can often be distinguished from abnormal ones on a single examination using criteria previously mentioned, however if no accurate distinction between normal and abnormal can be made, serial examinations should be carried out before any active management is advocated.

#### **References**

1. DONLAD, I. MORELY : Diagnosis of blighted ovum by sonar. *British Journal of Obstetrics and Gynaecology*, 79, 304-310, 1989.
2. BERNARD, K.G. and COOPERBERG, P.L. : Sonographic differentiation between blighted ovum and early viable pregnancy *American Journal of Roentgenology*, 144, 597-602, 1990.
3. NYBERH, D.A. and FILLU, R.A. : Distinction between normal and abnormal gestation sac. *Radiology*, 158, 397-400, 1986.