

## PLACENTAL LOCALISATION BY ULTRASOUND COMPOUND SCANNING

by

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### Introduction

Placentography by ultrasonic scanning has been claimed to be safe, simple and accurate by Donald and Abdulla (1967a, 1967b), Donald (1968), Campbell and Kohorn (1968) and Kohorn *et al* (1967, 1968). This paper reports the experience with ultrasound placentography obtained during the first year after the introduction of B-scan equipment into this Unit.

### Method and Materials

Ultrasonic localisation of the placenta with the B-scan was performed, using the method described by Donald (1965). Our apparatus is ALOKA made in Japan. A pulsed frequency of 2.25 MHz per second is used for diagnostic purposes in obstetrics and gynaecology. The patient is examined on a moving couch. The abdominal wall is liberally smeared with olive oil to secure acoustic coupling. Usually longitudinal scans from xiphisternum to symphysis pubis are undertaken first, followed by transverse scans at different levels. The characteristic appearances of the placenta on an ultrasonogram is a speckled area demarcated by a line which represents the foetal surface of the placenta. To visualise the outline of the cervix and the adjacent uterine wall a full bladder is a necessity. This enables to demonstrate the distance of

the lower edge of the placenta from the cervix and whether or not the placenta covers the internal os. The placental site can be visualised from the tenth week of gestation. The examination takes from 10 to 15 minutes and causes no discomfort to the patient.

It is classified as grade IV placenta praevia if the whole thickness of the placenta covers the cervix, grade III if the edge of the placenta covers the cervix, grade II if the edge of the placenta reaches the cervix and grade I if the edge stops above the cervix.

One hundred and fifty patients were examined in whom the site of the placental attachment was finally determined by examination under anaesthesia at caesarian section in 140 cases and at the time of manual removal of a retained placenta in 10 cases. Table I shows the clinical indications for ultrasound localisation of placenta. Patients were scanned between 20 and 40 weeks of gestation.

TABLE I  
*Clinical Indications for Ultrasound  
Localisation of Placenta*

Indication	Number of patients
Antepartum haemorrhage	75
Unstable lie	25
High presenting part	23
Preceding elective caesarean section	15
Breech	9
Prior to amniocentesis	3
Total	150

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Table II shows the results of placental localisation using ultrasonic scanning.

TABLE II  
Results of Placental Localisation Using Ultrasonic Scanning

Ultra-sound diagnosis	Actual placental site	
	Lower segment	Upper segment
Correct	46 (95.84%)	102 (100%)
Incorrect	2 (4.16%)	0
Total	48	102

### Results

Twelve of the forty-eight (25%) cases of placenta praevia were silent and were discovered as a result of ultrasonic scanning. Figures 1 to 8 show examples of placentas lying in various parts of the uterus. One of the two incorrect localisation was in a patient who was scanned at 22 weeks of gestation prior to a diagnostic amniocentesis. The placenta was described as being large posterior and upper segment scanning was not repeated later in pregnancy. When elective caesarean section was performed at 38 weeks on account of Rhesus isoimmunisation, a posterior bipartite placenta was found whose smaller lobe covered the internal os. The second incorrect localisation was in a multigravida who was scanned to exclude multiple pregnancy at 32 weeks of gestation. There was a singleton pregnancy with hydramnios. The placenta was described as large posterior and mainly in the upper segment with the lower edge dipping into lower segment. The patient's bladder was not full at the time of scanning, and since the procedure was not being performed specifically to localise the placenta the scan was not repeated. At 38 weeks, examination under anaesthesia was performed because of a persistently high head and a third degree

placenta praevia was found, the diagnosis being further substantiated at caesarean section. This case illustrates the importance of undertaking the ultrasound localisation of the placenta only when the patient's bladder is full.

### Discussion

This investigation suggests that placental localisation by ultrasound is accurate. The placenta can be shown by ultrasound from the first trimester onwards. Ultrasound allows visualisation of the foetus, particularly the presenting part as well as the placenta and the lower uterine segment, for which a full bladder is essential. In all cases ultrasound allows positive visualisation of the posterior placenta, while with radio isotope scanning the anterior and posterior position of the placenta must be inferred by the relative intensity of the count.

All other methods of placental localisation involve exposure of the mother and the foetus to irradiation. The works of Stewart and Kneale (1968) indicates that irradiation is preferably avoided altogether during pregnancy and numerous investigators have demonstrated that pulsed ultrasound as used in diagnostic work has no harmful effect on the foetus (Smyth 1966; Kohorn *et al* 1967; Abdulla *et al*, 1971; Hellman *et al*, 1970; and Boyd *et al*, 1971).

This is a simple and safe method of placental localisation and can be repeated without any risk or inconvenience to the mother or risk to the foetus. This is important as there is an increasing demand for placentography, particularly during the middle trimester.

Our first year's experience with ultrasound scanning as a means of placental localisation has been encouraging. In 98.7 per cent, the placentae were accurately localised and forty-six out of forty-eight

cases of placenta praevia were correctly identified. There were two (4.16%) false negative results, at least one of which would have been avoided if the scanning had been repeated with a full bladder. These results are similar to those reported by others. Donald and Abdulla (1968) reported 94 per cent accuracy, Campbell and Kohorn (1968) reported also 94 per cent accuracy, Bishop (1966) reported 65 per cent accuracy, Gottesfeld *et al* (1966) reported an accuracy of 97 per cent and Taylor *et al* (1967) also reported 97 per cent accuracy.

#### Summary

Placental localisation was performed in 400 cases by ultrasonic scanning. Confirmation of the exact site of the placental attachment was obtained in 150 cases and in 148 of these the ultrasound diagnosis was confirmed. The technique used and the characteristic appearance of the placenta on an ultrasonogram are described. It offers a means of placental localisation which is reliable, safe and speedy.

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*See Figs. on Art Paper III-IV*