

RELIABILITY OF TRANS-ABDOMINAL ULTRASONOGRAPHY IN DETERMINING EXACT LOCATION OF PLACENTA IN PATIENTS OF PLACENTA PREVIA MAJOR

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ABSTRACT

Objective: To determine the reliability of trans-abdominal ultrasonographical localization of placenta in cases of placenta previa major, by taking peroperative finding as gold standard.

Study Design: Validation study.

Place and Duration of Study: Maternity ward, Obstetrics and Gynecology department, Military Hospital Rawalpindi from 2007 to 2008.

Patients and Methods: A total of 100 patients fulfilling the inclusion and exclusion criteria were recruited for the study. These patients were admitted to the maternity ward, where trans-abdominal ultrasound was performed, site of the placenta and its relation to the internal os was documented. These patients underwent elective cesarean section, during which the site and relation of the placenta to the internal os was confirmed.

Results: The mean age of patients was 34.23 ± 6.76 years. Transabdominal ultrasound had a sensitivity of 93.4% in localizing major placenta praevia while the specificity was 83%. Positive predictive value was 94.7%, negative predictive value was 80% and accuracy 91%.

Conclusion: Trans-abdominal ultrasound was found highly effective in diagnosing and localizing placenta previa.

Keywords: Cesarean section, delivery, obstetrics, prenatal, placenta previa, ultrasonography.

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INTRODUCTION

Placenta Previa is a common yet underestimated and under reported condition¹. Maternal and fetal morbidity and mortality from placenta previa are considerable and associated with high demand on health services².

By definition, placenta previa is the condition in which placenta is situated in the lower uterine segment². If it encroaches on the cervical os, it is considered major or complete previa, if not, then minor or partial previa exists. This diagnosis has evolved from the original I-IV grading system and is determined by ultrasonographic imaging techniques, relating the leading edge of the placenta to the cervical os and the leading fetal pole³.

Normally placenta is situated in the upper

half of the uterus; however, some times placenta develops at an abnormal site. A low lying placenta in the second trimester can progress to the upper segment in the third trimester due to rapid growth of lower uterine segment^{4,5}.

Ante-partum hemorrhage complicates 2-5% of pregnancies, with placenta previa being the cause in approximately one-third of such cases². Hemorrhage is especially likely to occur when uterine contractions dilate the cervix or when separation is provoked by unwise digital vaginal examination⁶.

Trans-abdominal ultrasound has played a revolutionary role in accurately diagnosing abnormal placentation⁷.

All cases of antenatal diagnosis of placenta previa especially those with a prior cesarean scar should be managed vigilantly with adequate blood transfusion and with the presence of senior obstetricians during surgery to prevent maternal catastrophes.

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PATIENTS AND METHODS

The study was done in the maternity ward, obstetrics and gynaecology department, Military Hospital Rawalpindi from Jan 2007 to Jan 2008.

We enrolled 100 consecutive patients at 34 or more weeks of gestation with ultrasonographically diagnosed major placenta previa after obtaining informed, written consent. Patients with multiple pregnancies, deformities of the uterus and cervical or uterine fibroids were excluded from the study. The inducted patients were admitted to the maternity ward, where transabdominal ultrasound was performed, site of the placenta and its relation to the internal os

We also studied these patients in terms of their age, parity, previous caesarian sections and need for emergency hysterectomy.

Data analysis were carried out using SPSS 17. Descriptive statistics were used to describe the data. Sensitivity, specificity, positive predictive value, negative predictive value and accuracy were calculated for transabdominal ultrasound for detection of partial and complete placenta previa using operative findings as gold standard.

RESULTS

One hundred female patients were included in this study, having a mean age of 34.23 ± 6.76

Table-I: Ultrasound and operative findings in (n=100).

| Ultrasound Finding | Operative Findings | |
|--------------------------|--------------------------------|---------------------------------|
| | Partial placenta previa (n=75) | Complete placenta previa (n=25) |
| Partial Placenta Previa | 71 | 4 |
| Complete Placenta Previa | 5 | 20 |

was also documented. Their ultrasound was performed within 02 weeks preceding caesarian section by consultant obstetrician and consultant radiologist. These patients later underwent elective caesarian section by senior obstetrician in the presence of experienced anaesthetist during which the site and relation of the placenta to the internal os was confirmed. The relation of the placenta to the internal os was expressed as partially covering the os and completely covering the os

The ultrasound was performed by consultant obstetrician and later confirmed by consultant radiologist.

A transverse incision of the lower segment of the uterus was used in all the cases. In patients with anterior placenta praevia the surgeon first defined the placental edge and then went through the membranes above or below the placenta to deliver the baby. In only 5 of the patients the surgeon had to go through the placenta.

years. Majority of the patients were para 3 or more.

A total of 75 patients were diagnosed on antenatal ultrasound to be having partial placenta

Table-II: Validity outcome of transabdominal ultra sonographical localization of placenta.

| Parameters | Percentage |
|---------------------------|------------|
| Sensitivity | 93.4 |
| Specificity | 83 |
| Positive predictive value | 94.7 |
| Negative predictive value | 80 |
| Accuracy | 91 |

praevia and 25 patients had complete placenta previa. During surgery 76 patients were found to be having partial placenta previa while 24 patients had complete placenta praevia table-I. Thus transabdominal ultrasound has a sensitivity of 93.4% in localizing major placenta previa while the specificity is 83% and accuracy is 91%. Positive predictive value was 94.7% and negative predictive value was 80%, as shown in table-II.

Out of the 100 patients 5 had to undergo emergency hysterectomy as shown in fig-1. Two of these patients had placenta accrete. Out of the 5 patients who underwent hysterectomy, 3 had previous c sections while 2 had no previous c section as shown in fig-2.

DISCUSSION

Diagnostic modality of choice for placenta previa is trans-vaginal ultrasound; however, since it is not widely available every where in developing countries also because of fearsome risk of torrential vaginal bleeding occurring in case of vaginal probe accidentally hitting the os in placenta previa major; transabdominal ultrasound seems a safer option. The patients with an antepartum diagnosis of placenta previa with previous cesarean section should be considered at high risk of developing placenta accreta⁸.

The policy of our unit is that all patients with major placenta previa are considered high risk pregnancies requiring full involvement of senior medical staff during antenatal period. Four units of blood are arranged for operation of major degree placenta previa. Operations of such patients are planned as an elective procedure and are performed by consultant obstetrician in the presence of an experienced anaesthetist.

The time interval between ultrasound and delivery has significant influence on the classification and clinical outcome of placenta previa. Several studies have demonstrated that the distance between the placental edge and cervical os changes as the pregnancy advances⁹. Two previous studies were inducted done to examine ultrasound findings in late pregnancy and showed a longer time interval between ultrasound and delivery. Oppenheimer et al performed a retrospective analysis of 52 cases of placenta previa, where ultrasound examinations were performed on an average of 05 weeks prior to delivery¹⁰. Dawson et al used Trans-labial ultrasound in 40 women with suspected placenta previa with an average interval of six weeks

between ultrasound and delivery¹¹. We, however, did the scan within 02 weeks.

Another study which supports our study was conducted by Lodhi SK et al, they assessed the role of ultrasound in detecting the migration of placenta previa during the third trimester. In their study ultrasound was repeated every two weeks until delivery or placental migration for more than 3 cm from the internal cervical os. Detailed information for placental position, distance from cervical os and relation to the presenting part was recorded. Women with major degree placenta previa were admitted in the

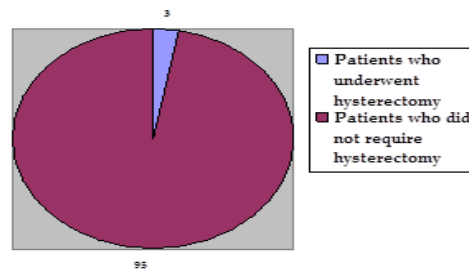


Figure-1: Patients details regarding Hysterectomy.

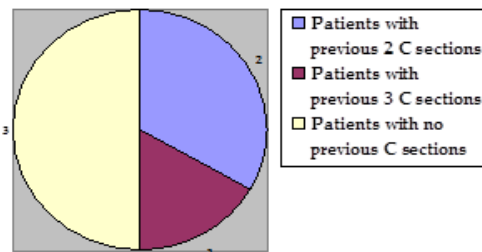


Figure-2: Patients details regarding C-section.

hospital at 32 to 34 weeks of gestation. Delivery plan was made according to degree of placenta previa after completing 37 weeks of gestation. Cesarean section was done for the women with major degree placenta previa or minor degree placenta previa with antepartum hemorrhage and obstetric indication. Out of 80 women placental migration to a distance of more that 3 - 5 cm from the internal cervical os occurred in 20 cases by 36 weeks of gestation and 20 had complete placenta previa. Out of remaining 40 cases 12 patients had vaginal delivery and 28 had

cesarean section. Placental migration was not observed in women with total placenta previa or posterior placenta previa when the distance of lower edge of placenta was less than 1 cm from the internal cervical os, concluding that ultrasound is important for the diagnosis of placental localization and placental migration during third trimester¹².

In our study most of the women were aged 31-35 years whereas a smaller number were below 25 years or above 35 years. The least of them were above 40 years, which may be partly due to the fact that most of the women have completed their families near this age and not much of the patients report with a pregnancy after 40 years of age. This is in comparison to other studies¹³. In a study by Cieminiski A and Dlugolecki F, the occurrence of placenta previa increased with maternal age and was highest in women aged 35 years or older and lowest in women less than 25 years. In their study advancing age and multiparity appears to increase the occurrence of placenta of previa¹⁴.

In our study maximum number of patients (n=43) were para 3. Hussian et al, in their study saw the prevalence of lower segment placenta and its relation with previous cesarean section, parity and maternal age. In their study prevalence of placenta previa (2.58%) was seen in third and higher gravida groups. Also higher prevalence was seen in 30 years and above as compared to below 30 years age group¹⁵. In a study by Malik AM et al, it was concluded that placenta previa is more prevalent in elderly, grand multiparous with history of previous cesarean delivery¹⁶.

In our study there was no case of wound infection or hematoma. No anesthetic complication was encountered because all surgeries were performed in the presence of senior anaesthetist who was aware of potential problems that can arise in such cases, thereby proving that anticipation and timely management can keep the risk to minimum¹⁷.

Out of total five emergency obstetric hysterectomies in our study, 03 were associated with previous cesarean sections, all were multiparous with age more than 30 years. Out of two cases of placenta accrete, which ended up in obstetric hysterectomy, one had bladder injury during surgery which was repaired immediately. Perveen S in a case series studied the reasons of emergency hysterectomy, concluding that the main indication of emergency cesarean hysterectomy was adherent placenta in patients with placenta previa and previous uterine scar¹⁸.

Placenta previa and placenta accrete with accompanying hemorrhage are the main contributors in maternal mortality. These are preventable deaths in experienced hands. Taddesse et al, studied that blood loss in operations done by junior residents were more than that by consultants¹⁹.

Our study supports the role of trans-abdominal ultrasonography in antenatal diagnosis of cases of placenta previa major, which enables us to be well prepared, with expert handling of such high risk pregnancies, leading to timely decisions and hence reduced fetomaternal complications.

CONCLUSION

Trans-abdominal ultrasound was found highly effective in diagnosing and localizing placenta previa.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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