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Follow up of potential placenta previa detected during II trimester targeted scan

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Abstract: *Placenta previa is a rare but leading cause of III trimester bleeding which causes significant maternal and fetal morbidity and mortality. Timely diagnosis of placenta previa is of utmost importance This was a prospective observational study aimed at placental localization in 5424 patients referred for II trimester targeted scan from May 2018 to April 2019 for a period of 12 months. Potential placenta previa defined as placenta with lower egde < 2cm from the os or touching or covering the os was identified in 108(2%) of the cases. These patients were followed up to evaluate the placental migration. Placenta previa was diagnosed in 20 cases(18% of the potential placenta previa cases and 0.3% of the total cases.)16 out of the 20 cases had caesarean delivery. None of the placenta previa cases were missed during the targeted scan. Hence placental localization during II trimester targeted scan is an indispensible screening tool in diagnosing placenta previa.*

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I. Introduction

Placenta previa is a term that refers to a placenta that is previous to the fetus in the birth canal[1].Placenta previa is a rare but important cause of III trimester bleeding[2]. Placenta previa causes significant increase in maternal, fetal as well as neonatal morbidity and mortality if not managed effectively. Therefore timely and accurate diagnosis of placenta previa is of paramount importance. The incidence of placenta previa at term ranges from 0.2 to 1.2%[3]. The detection rate of potential placenta previa varies from 1.9 to 5% during mid pregnancy scan[4]. However the low persistence rate of previa to term is attributed to several factors[5]. They include technical factors like overdistended bladder or concomitant lower uterine segment contraction. It is commonly explained by the concept of placental migration. The term placental migration is often misleading. It is explained that the placenta is carried towards the fundus away from the os due to the elongation of the uterus and differential growth primarily in lower uterine segment[6]. This is postulated to cause the low persistence of mid trimester previa to term[7]. Therefore patients detected with low lying placenta during II trimester scan must be followed up in III trimester to reevaluate the placental location[8,9]. This study aims to detect the potential placenta previa cases during II trimester targeted scan and follow up those cases to term and identify the cases which persist as previa till term[10].

II. Material And Methods

This prospective comparative study was carried out on antenatal patients referred from the department of Obstetrics and Gynaecology to the Department of Radiodiagnosis for II trimester targeted scan

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of Radiodiagnosis, at Tirunelveli Medical College Hospital, Tirunelveli, TamilNadu, India.

Study Duration: May 2018 to April 2019 for a period of 12 months.
Sample size: 5424 patients.

Inclusion criteria:

1. Pregnant women referred for targeted scan between 20 to 22 weeks

Exclusion criteria:

1. Multiple pregnancies
2. Terminated pregnancy due to congenital anomaly
3. Patients who lost follow up at 36 weeks

Procedure methodology

The study protocol was approved by the institutional ethical committee. An informed consent was obtained from the patients.

Evaluation was done using Mindray DC N3 machine with curvilinear probe of frequency range 3 – 5 MHz.As a part of the targeted scan between 20 to 22 weeks, placental localization was done by transabdominal route with empty or near empty bladder in the absence of lower uterine segment contraction[7]. In the presence of lower uterine segment contraction the placental localization is re evaluated after the contraction goes off. Placental localization was grouped as follows[2]:

1. Normal – lower edge >2cm from the internal os
2. Potential previa:
    a. < 2cm from the os
    b. Touching or covering the os

Patients with potential placenta previa were rescanned at 36 weeks to determine the placental location. In cases when the visualization of lower placental edge and /or cervix was difficult due to obscuration by fetal parts, transvaginal scan was done

Placenta previa at term was classified as follows:

1.Grade I: Lowlying : lower edge of placenta <5cm from the internal os.
a.lower edge 2-5cm from os
b.lower edge 1-2cm from os
c.lower edge <1cm from os
2.Grade II : Marginal: lower edge of placenta reaches the internal os but not covering it
3.Grade III : Complete: lower edge covering the os[1]
Placenta previa cases were followed up and the mode of delivery and placental location was confirmed in all cases.

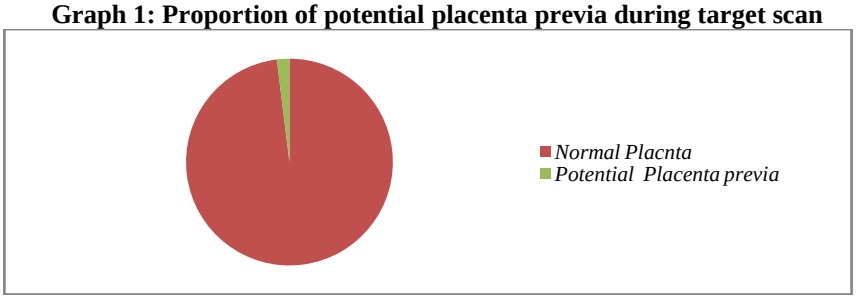
Statistical analysis

Data was analyzed using SPSS version 20. The sensitivity, positive predictive value and diagnostic accuracy of placental localization during II trimester targeted scan in diagnosing placenta previa was calculated.

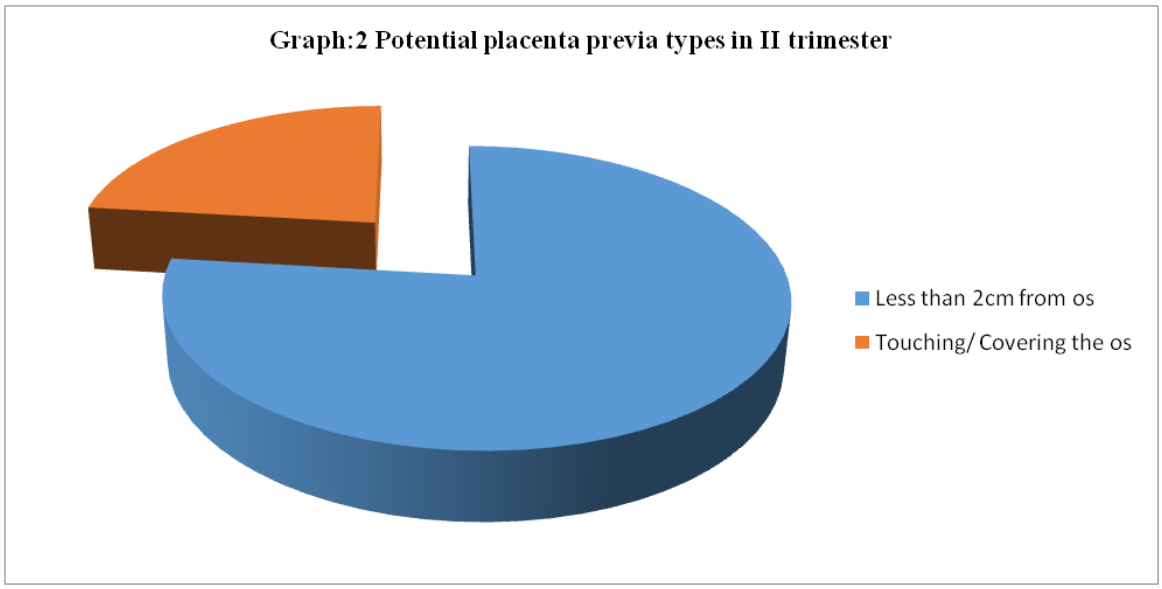
III. Results

Total cases in whom placental localization was done during II trimester targeted scan: 5424
Number of cases diagnosed as potential placenta previa: 108 (2%)

Graph 1: Proportion of potential placenta previa during target scan



Types of low lying placenta detected during II trimester targeted scan:
<2cm from os: 83
Touching / Covering the os: 25



Placenta previa at term: 20 cases

Table: 1 Types of placenta previa at term:

Type of placenta	Number of cases
Grade 1.Lowlying placenta	14
a.2-5cm	6
b.1-2cm	4
c.<1cm	4
Grade 2.Marginal	3
Grade 3.Covering os	3
Total	20

Graph 3: placenta previa types at term

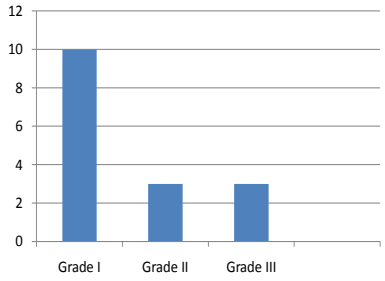


Table 2: Comparison of cases detected as potential previa during targeted scan and previa at term

20WEEKS PREVIA	TERM PREVIA			
		POSITIVE	NEGATIVE	TOTAL
	POSITIVE	20	88	108
	NEGATIVE	0	0	0
	TOTAL	20	88	108

Sensitivity : 100%
Positive predictive value: 18.52%
Diagnostic accuracy: 18.52%

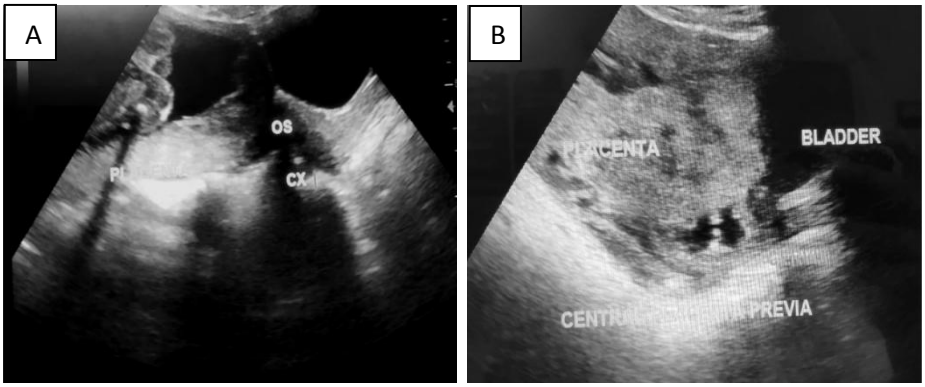


Figure 1 - A: 20 weeks - Lower edge covering the os, B: 36 weeks – Complete placenta previa

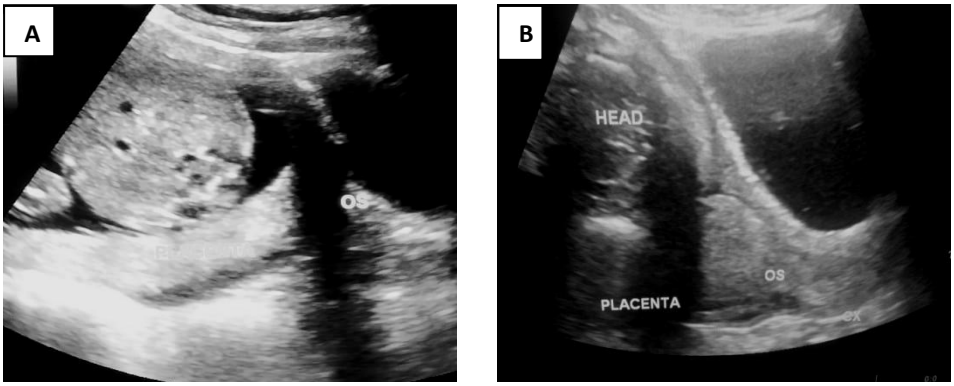


Figure 2- A: 20weeks - Lower edge covering the os, B: 36weeks- Complete placenta previa

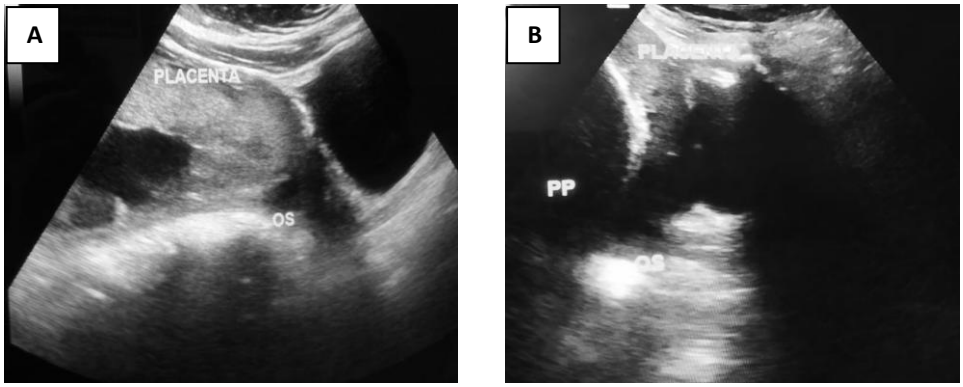


Figure 3- A: 20weeks - Lower edge covering the os, B: 36weeks- Marginal placenta previa

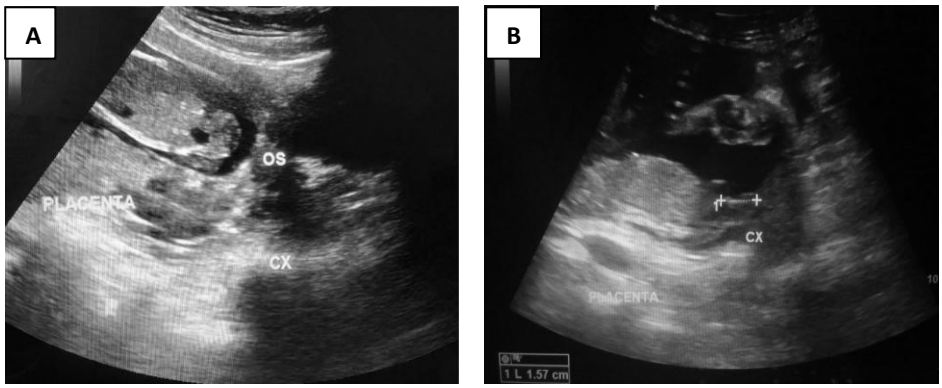


Figure 4 - A: 20weeks - Lower edge 1cm from os, B: 36weeks- Grade I lower edge 1.5cm from os

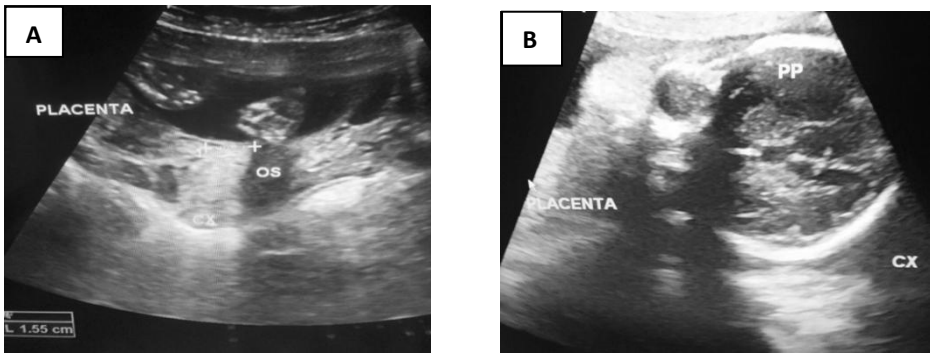


Figure 5 - A: 20weeks - Lower edge 1.5cm from os, B: 36weeks- No previa

IV. Discussion

Potential placenta previa during II trimester targeted scan at our institution is termed for the placenta if the lower edge is less than 2cm from the os or touching or covering the os. The incidence of potential palcenta previa at our institution was 108 out of the 5424 patients which accounts to 2%. Artis et al[11] described incidence of midtrimester previa as 0.4% by transabdominal route. They ascribed the lower incidence to meticulous scanning techniques like emptying the bladder and waiting for the myometrial contractions to resolve. Similar techniques were strictly followed in our study. Lauria et al[5] described an incidence of 2.7% with similar techniques which correlates with our study. Taipale et al[4] reported incidence of placenta previa as 4% at 12-16 weeks, 2% at 18 – 20 weeks and 1% at 21 -23 weeks and thus preferred 21- 23 weeks for midpregnancy placental localization.

We followed transabdominal route in all cases and used transvaginal ultrasound only when the diagnosis was inconclusive in the follow up scan at 36 weeks. Becker et al[2] used transvaginal ultrasonography only in uncertain and suspicious situations (4.2%) and missed no cases of placenta previa at delivery and considered transabdominal ultrasonography is satisfactory for screening of placenta previa. In our study also none of the placenta previa cases was missed in II trimester scan by transabdominal route. Many studies advocate transvaginal ultrasonography as a superior method for evaluating placental location[12]. But Heller et al[7] reported that cervix is rarely obscured by fetal parts in the II trimester and transvaginal scan is not always warranted.

Out of the 108 cases identified as potential previa, in 83 cases the lower edge was within 2cm form the os. In the remaining 25 cases the lower edge was touching or covering the os. In our study the extent of placenta overlapping the os was not measured. Taipal et al[4] considered 15mm, Lauria et al[5] considered 10mm of overlap of the os as cut off point to identify all cases of placenta previa at delivery.

The incidence of placenta previa at term was 0.3% in our study which is close to the reported incidence of 0.5%. Taipal et al[4] reported a very low incidence of 0.14%. They explained the difference due to use of transvaginal ultrasound and other factors like rarity of grand multiparae, racial factors and lack of selection bias.

In our study follow up was done at 36 weeks . Heller et al reported[7] the clearance rate of low lying placenta as 66% at 27 weeks, 90% at 32 weeks and 96% at 36 weeks.

In the follow up scan at 36 weeks , out of the 108 cases 20 cases had persistent previa. Out of the 20 cases 3 cases were marginal placenta previa and 3 cases were complete placenta previa covering the os. 14 cases were Grade I placenta previa. Out of the 14 cases, 4 cases were within 1cm from the os, 4 cases were 1-2cm from the os. In 6 cases the lower edge was 2-5 cm from the os.

The mode of delivery was followed up in all cases to confirm the placental position. All cases of complete previa (3 in number), marginal previa(3 in number), placental lower edge <1cm form the os (4 in number), placental lower edge 1-2cm from the os(4 in number) were delivered by caesarean section. 2 out of the 6 cases in which lower edge was 2-5cm from the os were also delivered by caesarean section. Rest of the 4 cases had vaginal delivery. The placental position was confirmed in all cases.

Heller et al[7] reported caesarean deliveries in all cases of complete and marginal previas and when lower edge was less than 2 cm from the os. They attributed the caesarean delivery as an institutional practice in any case with persistent previa. Hence they reported that it could not be commented whether any case of marginal previa could have safely delivered vaginally. Vergani et al[13] suggested that if the placenta to os distance was more than 1cm, safe vaginal delivery was possible without any increased risk of hemorrhage. However this study was limited by not analysing the chances of mode of delivery in cases with placenta previa.

The sensitivity of detection of placenta previa is 100% in our study which was in comparison to the study conducted by Lauria et al[5]. All cases of persistent previa were identified during the II trimester scan. Inspite of the low positive predictive value due to the low persistence rate of previa at term, placental localization is mandatory in II trimester targeted scan.

V. Conclusion

Incidence of low lying placenta at targeted scan is much commoner than placenta previa at term due to the well known concept of placental migration. But accurate and timely diagnosis of placenta previa alleviates any maternal, fetal and neonatal morbidity and mortality. None of the cases of placenta previa were missed during the targeted scan. So placental localization during targeted scan, identifying potential placenta previa and follow up of such cases is indispensible in the timely and exact diagnosis of placenta previa.

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