

Gross study of Placenta in Normal and IUGR cases

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ABSTRACT-The placentas of 100 mothers with Intrauterine Growth Retardation(IUGR) were compared to placentas collected from 100 mothers who had uncomplicated pregnancies. This study demonstrated that, marginal insertion of umbilical cord is associated with IUGR babies. The findings of this study support the hypothesis that, in IUGR some alterations in uteroplacental blood flow and possibly umbilical blood flows causes significant changes in placental structure and function.

KEYWORDS-Insertion, IUGR, Umbilical blood flow, Uteroplacental circulation, Umbilical cord

I. INTRODUCTION

Every placenta shows many degenerative features, these are physiologic sequence of evolution, when they occur in excess, they must be considered as pathological, particularly when they affect foetal growth deleteriously. A wide variety of morphologic changes has been reported in the placentas of IUGR cases. The reports on the attachment of umbilical cord on placenta in Intrauterine growth retardation cases (IUGR) are scanty. Therefore it was decided to study the exact site of umbilical cord attachment in IUGR cases and its correlation with placental weight and foetal weight. Perceival (1980)¹ observed that the eccentric attachment of the umbilical cord was most common in normal placenta. Shanklin (1970)² noticed marginal type of cord insertion in infants weighing less than 2500 gms. He after studying 5000 placentas, observed a high degree of correlation between anomalous cord insertion and low birth weight. Rath et al (1994)³ observed that association between marginal attachment of the cord and low birth weight is statistically significant. The low birth weight may be explained by an altered distribution of foetal blood in the placenta as a result of different modes of arrangement of intracotyledonary vessels of placenta of complicated pregnancy. This vascular arrangement may be hampering equal distribution of blood flow in the placenta, increasing the risk to the mother and fetus.

II. MATERIAL AND METHODS

The study of placentae in normal and IUGR cases was carried out at R.N.T. Medical College & Hospital, Udaipur. The placentae were collected from 200 women admitted to the labour Rooms of the hospital (either directly or through the antenatal wards). All the cases were within the age group of 18-40 years, of average height and weight and includes both primigravida and multigravida. GROUP 1- NORMAL PREGNANCY 100 patients included in this group, normal Hb and urine analysis, not associated with any disease.

GROUP 2-IUGR CASES 100 cases of IUGR were included. After the delivery placentae were collected for gross studies, length and site of insertion of umbilical cord were noted. The placenta was washed and surface dried between blotting papers, the surface area of the placenta was recorded by cutting out its shape on a piece of plastic sheet which was mapped on a graph sheet to calculate the area, assuming the placenta to be a perfect circle, the mean radius 'r' was estimated from the surface area. The minimum distance between the site of insertion of umbilical cord and the margin of the placenta was measured and denoted as 'd'. The insertion percentage = $d/r \times 100$ was then worked out.

A low insertion percentage implies a marginal insertion, while a high insertion percentage indicates a centrally attached umbilical cord.

III. OBSERVATIONS & RESULT

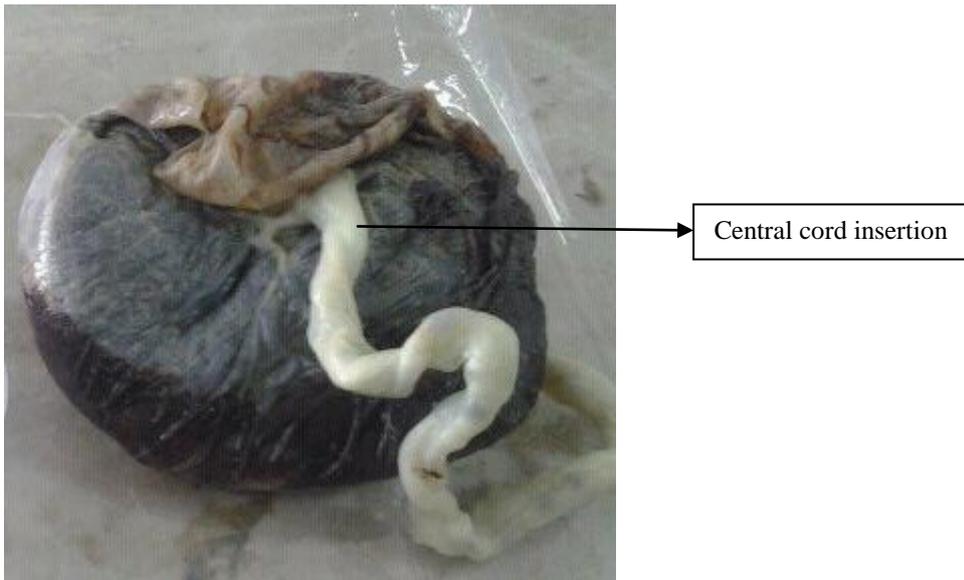


Fig: normal control placenta showing fetal surface and central cord insertion

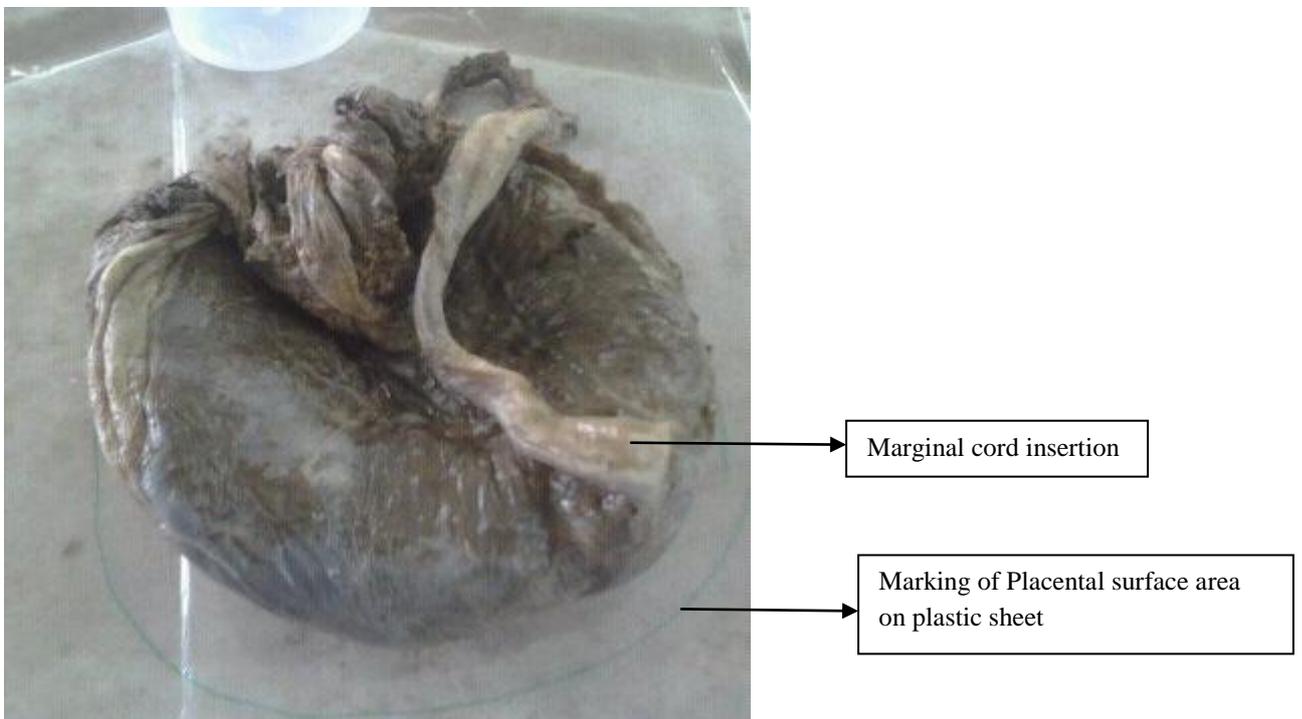


Fig: IUGR placenta showing fetal surface and Marginal cord insertion

TABLE NO-I
INSERTION OF UMBILICAL CORD IN CONTROL GROUP

Insertion	No. of Placentas	% of Placentas
Central	38	38
Lateral	25	25
Marginal	18	18
Medial	19	19

TABLE NO-II
INSERTION OF UMBILICAL CORD IN IUGR GROUP

Insertion	No. of Placentas	% of Placentas
Central	29	29
Lateral	22	22
Marginal	35	35
Medial	14	14

IV. DISCUSSION

Table-III: Statistical comparison of insertion of umbilical cord in control and research group

Author and year	Place	Number of cases	Insertion(Marginal/Ecentric) in %		Result
			Control	Research	
Kotgirwar ⁴ (2011)	Bhopal	55	14	18	Insignificant*
Pradeep S Londhe ⁵ (2012)	Andhra Pradesh	374	1.8	8.5	Significant*
Gediminas Meëëjus ⁶ (2005)	Lithuania	120	54.5	70.8	Insignificant*
Nayereh Ghomian et al ⁷ (2012)	Iran	46	78.3	60.9	Insignificant*
Present study	Udaipur	200	18	35	Significant*

*Significant $p < 0.01$, $p < 0.05$, *insignificant $p > 0.05$

The umbilical cord may have a central, lateral ,marginal or medial insertion ,central and lateral insertions account for more than 90% of cords and have no clinical importance(Heifetz 1996)⁸.Marginal insertions(5-7%)may be more susceptible to vessel rupture and has been associated with fetal growth retardation,stillbirth and neonatal death.Incidence of velamentous insertion(1-2%) increases with maternal cigarette smoking,advanced age or diabetes mellitus and among multiple births,malformed infants and in vitro fertilization pregnancies(Heifetz 1996)⁸.

In the present series,different insertions were:central 38 in control 29 in IUGR ,eccentric (medial)19 in control 14 in IUGR,marginal18 in control 35 in IUGR and Lateral 25 in control 22 in IUGR and these are included below.

In the present study, statistically significant value of marginal insertion of cord in IUGR (Research)group were found. The study is consistent with study of Pradeep S Londhe⁵ et al. Among western researchers Nayereh Ghomian et al⁷ , Gediminas Meëëjus⁶ observed insignificant value of marginal insertion of cord among research group.

In our study ,the marginal attachment of Umbilical cord with 0.25 insertion percentage was seen in 35% cases.The association between marginal attachment of the cord and low birth weight is statistically significant.The low birth weight may be explained by an altered distribution of fetal blood in the placenta as a result of different modes of arrangement of intra cotyledonary vessels of placentas of complicated pregnancy (Rath et al 1994)³. This Vascular arrangement may be hampering equal distribution of blood flow in the placenta,increasing the risk to the mother and fetus.Sonographic study could also show clearly the site of insertion of the umbilical cord of the placenta and in hypertensive mothers,it was mostly marginal.It confirms the observations of Pretorius et al(1996)⁹ and Di Salvo et al (1998)¹⁰.In case the ultrasound report reveals marginal attachment,it is advisable to get it confirmed by colour Doppler imaging,if possible.

S Biswas¹¹ (2013) Velamentous insertion and marginal insertion of cord was a significant finding in the placentas of IUGR fetuses. (Bjoro K Jr¹². Davies BR, Casaneuva E, Arroyo P¹³) Biswas and Ghosh¹⁴ found that in the majority of IUGR cases, positions of insertions of umbilical cords were eccentric whereas in the control group, the majority was central.In our study majority of IUGR cases, positions of insertions of umbilical cords were marginal whereas in the control group, the majority was central.

V. CONCLUSION

In conclusion, the present study reveals the method of precise location of umbilical cord by calculation of insertion percentage. It is noticed that it can be diagnosed during antenatal check up by available technique to further strengthen the proposed precautions to be taken during and after labour.

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