

MORPHOMETRIC VARIATION OF PLACENTA AND UMBILICAL CORD INSERTION

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ABSTRACT

Objectives: The main purpose of this study is to relate and appraise the morphological variations of placenta and umbilical cord in normal pregnancy.

Materials and Methods: The study included 100 placentas which were collected from Government Maternity Hospital Hashtnagri and studied in the Anatomy department of Khyber Medical College Peshawar over one month duration. The morphological variations of placenta, like shape, weight and attachment of umbilical cord were noted and photographed.

Results: In our study, we observed round placentas in 91 cases (91%), oval placentas in 5 cases (5%), irregular placentas in 3 cases (3%), and bilobed placenta in 1 case (1%), respectively. Normal cord insertion was found in 75% and abnormal insertion in 25% of cases respectively. The mean placental weight was 509.5g (normal weight ranges between 400 to 650gs).

Conclusion: In the present study, the majority of the placentas presented with round shape, few placentae with oval and irregular shape or with an accessory lobe. The existing study also included variations in insertion of umbilical cords which was eccentric in majority of the cases followed by central and marginal insertion.

Keywords: Anatomical variation, placenta, Umbilical cord

INTRODUCTION

The placenta is an intricate multifunctional structure. It is associated with gas exchange, nutrition supply, waste elimination, hormones function and immune maintenance. Placenta provides a unique circulating system for the developing intrauterine foetus.¹ The implantation of the blastocyst into the maternal uterus initiate the development of placenta, and it develops throughout the pregnancy. The placenta is a vigorous feto-maternal tissue containing decidua basalis (maternal) and chorion frondosum (embryonic) components. At the end of the first trimester (12 weeks) of pregnancy, the maternal blood

supply to the placenta is completed.^{2,3} The normal placenta attaches to the uterine wall and is a round or oval-shaped structure. It is roughly 22 cm (9 inches) in diameter, thickness is about 2–2.5 cm (8 to 1 inch).² The weight of the placenta in normal pregnancies varies from 400gms to 650gms.⁴

The foetal life line is umbilical cord.² In the human placenta many vessels traverse towards foetal surface.³ It is 55 to 60 cm in length and 2.0 to 2.5 cm in diameter at term.⁵ The umbilical cord contains two arteries and a vein and these vessels are enclosed by embryonic connective tissue called Wharton's jelly. The umbilical cord is inserted on the placenta in different positions which can be eccentric, central and marginal. Cord attachment to placenta can affect the growth of the fetus.^{6,7}

The placenta and cord are organs of vital importance for continuation of pregnancy and foetal

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nutrition. It has great importance amongst the embryologists, anatomists, pathologists and obstetricians.^{1,8} Abnormalities in the placental attachment of umbilical cord leads to congenital anomaly in fetus and is a factor of intra uterine growth retardation and preterm labour.^{3,9}

By knowing about the variations in the morphology of placenta and umbilical cord insertions, obstetricians and gynaecologists can take necessary precautions beforehand which can minimize placenta and umbilical cord related complications and improve fetal outcome. My study will help to highlight the variations in the placenta and umbilical cord in our part of the world.

MATERIALS AND METHODS

This study is descriptive and observational. A total of 100 placentas with umbilical cord were collected from Government Maternity Hospital Hashtnagri Peshawar. The study was conducted in the Department of Anatomy, Khyber Medical College Peshawar. The placentas with attached membranes and with umbilical cord were collected immediately after delivery and caesarean section. The morphological variations of the placenta and the attachment of umbilical cord were studied. The morphometric study of placenta which includes: shape, weight and insertion of umbilical cord were observed in fresh specimens.

Inclusion Criteria:

Pregnant women between the age of 20-35 years, with parity between 0-5 and full term with a blood pressure of 120/80 mmHg were included.

Exclusion criteria:

Those antenatal with diabetes mellitus, obstetric abnormalities, i.e. abruptio placentae, congestive cardiac failure, fallots tetralogy renal disease, liver disease twin pregnancy hypertension, jaundice and with history of preterm labour were omitted from this study.

RESULTS

In the present study, two arteries and one vein was observed in the umbilical cord and the average cord diameter was 1.17 cm. Centrally attached cord was found in 75% cases, 23% were eccentric and 2% were marginal. There was no remarkable difference in placental weight and the mean placental weight

was 509.5gms. The average thickness of the placenta was 2.03 cm.

In our study, we observed oval placentas (5%), round placentas (91%), irregular placentas (3%), and bilobed shaped placenta (1%), respectively.

Table 1:

Serial no	Umbilical cord insertion	Percentage
1	Central	75%
2	Eccentric	23%
3	Marginal	2%

Table 2:

Serial no	Placental shape	Percentage
1	Round	91%
2	Oval	5%
3	Irregular	3%
4	Bilobed placenta	1%

DISCUSSION

In our study, central cord insertion was seen in 75% of cases, eccentric in 23% and marginal insertion in 2% of cases.

In the present study, we found 75% of cases with central insertion of cord, only 25% with eccentric and marginal attachment. This work correlates the work of Mane.

In the present study velamentous cord insertion was not found as we excluded patients with advanced maternal age, hypertension metabolic disorder like diabetes mellitus and other fetal abnormalities, which correlates with Kishwara et al. 2009. Chandni Gupta et al. 2019 described the average diameter of umbilical cord as 1.16 cm but in our study, it was 1.17 cm. Kishwara et al. 2009 found placenta of oval, round, and irregular shape in 38.3%, 36.6%, and 25% of cases, respectively, but in our study, we observed oval (5%), round (91%), irregular (3%), and bilobed shape placenta (1%), respectively. Our work shows similarities with work of Raghunath et al. as he worked on 101 placentae out of which 94 were round in shape and 7 were oval in shape. Kurlandaivelu et al. found that out of the 51 placentae, 48 were circular and 3 were oval in shape. Large and massive placentas are indicators of future diabetes and hypertension.

In our study, the thickness of the placenta was

2.03 cm, which was almost similar to the studies of Raghunath et al, as he noted 2.1 cm.

CONCLUSION

The knowledge of placental attachments of umbilical cord is important as abnormal attachment can cause intrauterine death of fetus due to tear of umbilical vessels during labour.

Abnormal shape especially bilobed placenta and extra lobes are mistaken for retained placental tissues.

In my study I have examined the structure of placenta and umbilical cord in our part of the world which will help us in the future management of mother and new-born and help us in avoiding complications.

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