



ISSN: 2277- 7695

TPI 2016; 5(3): 37-40

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www.thepharmajournal.com

Received: 18-01-2016

Accepted: 22-02-2016

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Study of discrepancies in human placental attachment of umbilical cord and its clinical implication

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Abstract

Introduction: The human placenta is circular, hemochorial and deciduate that functions as a fetomaternal organ. It is made from sac frondosum & decidua basalis. Abnormalities among the event and computing machine of insertion of the umbilical cord can have an impact on maternal and fetal well-being. The umbilical cord is often attached near to the centre of the placenta. The numerous kinds of umbilical cord attachment into the placenta are: central, eccentric, battledore (marginal), velamentous (membranous) and separate. Therefore, information relating to the variations among the placental attachment of umbilical cord is significant for clinicians.

Aims and Objectives: This study is undertaken to ascertain various kinds of placental attachment of umbilical cord.

Materials and Methods: The samples were 100% solution mounted 100 cord human placentas collected from department of medicine. The study was administered in department of Anatomy, Subharti University, Meerut, India. Study of varied kinds of placental attachment of umbilical cord was done by eye observation. The data obtained was tabulated & statistically analysed.

Observations and Results: Out of 1 hundred placentas determined sixty-eight placentas had central attachment of umbilical cord, sixteen placentas had eccentric attachment, twelve placentas had battledore (marginal) attachment and 4 placenta had membranous (velamentous) attachment.

Conclusion: Variation among the placental attachment of umbilical cord is explained to diverse nonhereditary variances. Therefore, early prenatal ultrasonographic identification of anomalies helps in reducing the risk in maternal and perinatal outcome.

Keywords: Umbilical cord attachments – eccentric, battledore, velamentous, furcate, nonhereditary anomalies, preterm labour

Introduction

The word placenta comes from Latin - flat cake and Greek -" Plakous" that suggests "flat, slab like." [1]. Only eutherian mammals possess placenta. The human placenta is circular, hemochorial and deciduate that functions as a feto-maternal organ. It is developed from sac frondosum & animal tissue basalis. The umbilical cord could also be a passage between the developing embryo or foetus and thus the placenta [2]. It is developed from the connective stalk or body stalk that connects the foetus & the placenta [3]. Anomalies among the event and computing machine of insertion of the umbilical cord can have an impact on maternal and foetal well-being. It leads to abnormality in foetus and associated with intra uterine growth retardation (IUGR) and preterm labour. The umbilical cord is often attached near to the centre of the placenta. It ought to insert at any purpose between its centre and margin, a condition remarked as a battledore placenta (marginal). Typically, the cord fails to realize the placenta itself and ends among the membranes as a velamentous insertion. In such cases larger branches of the purpose vessels traverse the membranes before they reach and divide on the placenta. They travel defenceless through the membranes to the placenta, that puts the foetus at risk as a result of firmness or tearing of the vessels can disrupt blood flow to and from the foetus. The cord would possibly branch off before the cord inserts onto the surface of the placenta resulting in a separate cord insertion [4]. Information relating to the variations among the placental attachment of umbilical cord is significant for Clinical Anatomists, Obstetricians & Gynaecologists and Radiologists. Therefore, this study is conducted to know the variations among the placental attachment of umbilical cord.

Aims and objectives: This study is undertaken to ascertain varied kinds of placental attachment of cord: 1) Central 2) Eccentric 3) Battledore (Marginal) 4) Velamentous (Membranous) 5) separa

Materials and Methods

The study was conducted in the, Department of Reproductive Medicine, National Institute of medical science and research Jaipur Rajasthan. Altogether normal placenta was taken in the study. Damaged, mutilated, distorted placenta was excluded from present study. Study of different kinds of placental attachment of umbilical cord was done by naked observation of eye. The data obtained was tabulated & statistically analysed

Study design: It is a descriptive study. The study was administered on 100% solution mounted 100 normal placentas in the department of Obstetrics and Gynaecology, National Institute of medical science and research Jaipur Rajasthan, India. The pattern of placental attachment of umbilical cord determined in all 100 specimens. Out of 1 hundred specimens, sixty-five placentas had central attachment of umbilical cord, seventeen placentas had eccentric attachment, eleven placentas had battledore (marginal) attachment and 5 placentas had membranous (velamentous) attachment Velamentous (Membranous) cord insertion (1%): insertion of the umbilical cord on the foetal (chorioamniotic) membranes. Separate cord insertion: once blood vessels divide before reaching the placenta.

Discussion

This study disclosed that commonest style of attachment of umbilical cord was Central (65%), tailed by Eccentric (17%), Battledore (Marginal) 11% and Velamentous (Membranous) 5%. This finding is similar with the findings of Jeyasingh T *et al.* [6] and Yousuf *et al.* [7]. Marginal cord insertion and velamentous cord insertions unit of measurement classified as abnormal umbilical cord attachment. Velamentous cord insertion occurs in near to the singleton pregnancies and Marginal cord insertion in near to 7% [8]. In Velamentous cord insertion, the umbilical vessels unit of measurement susceptible to compression and rupture as a result of the shortage of protection from Wharton’s jelly [9]. Velamentous cord insertion is eight times common in cord than singleton pregnancies, with double the risk with monochorionic cords, and three times risk in cord pregnancies with foetal growth restriction [10]. The pathological process of the abnormal umbilical cord attachment is not well understood. Three theories are proposed: 1) The abnormal primary implantation or ‘polarity theory’, that postulates that umbilical cord insertion computing machine is determined at initial implantation by the orientation of the foetal pole relative to the tissue layer surface; 2) The speculation of response that postulates that the placenta grows in areas where there is no good blood circulating areas and atrophies. 3) The “abnormal placental development because of diminished sac vessel branching” theory, that postulates that non-central insertion results from abnormal vasculogenesis among the placenta [8].

Advanced maternal age (>35 yrs) was significantly associated with associate increased risk of velamentous umbilical cord attachment. Donald N *et al.* [11] conducted a ultrasonographic (USG) study in forty-six pregnancies as well as thirty-eight singletons and eight cords for a whole of fifty-four placental umbilical cord attachments. Deformities among the placental attachment of umbilical cord are associated with complications of physiological state and poor foetal outcome as a result of compression of purpose vessels. These complications are associated with intrauterine growth retardation (IUGR) and preterm labour. There are several variations with cord insertion into the placenta [5]: Central insertion (90%): Eccentric cord insertion: lateral insertion of the umbilical cord >2 cm from the placental margin Battledore (Marginal) cord insertion (7%): insertion of the umbilical cord. They determined thirty-eight (70.37%) cord attachments, 12 (22.22%) marginal and 4 (7.41%) velamentous attachments, that was nearly virtually like present study. Sepulveda W *et al.* [12] conducted a color man of science ultrasonographic study in 825 pregnancies and determined 774 (93%) central attachments, 43 (5.21%) marginal attachments and eight (0.96%) velamentous attachments, that unit of measurement higher once place next to the present study. Separate style of umbilical cord attachment wasn’t determined in the present study but in line with study conducted by Manikanta R *et al.* [13], Shrivastava S *et al.* [14], and Arora NK *et al.* [15] determined 7.27%, 1.28% and 3.12% separate style of umbilical cord attachment individually.

Conclusion

The present study reveals the variations of human placental attachment of umbilical cord and thus the foremost typical kind was Central (65), followed by Eccentric (17), Battledore (Marginal) (11) and Velamentous (Membranous) 5. Variation among the placental attachment of umbilical cord is expounded to varied nonhereditary anomalies like preterm labour, low birth weight, intrauterine growth retardation (IUGR), oesophageal abnormally, anomaly and ventricular septal defect (VSD). So, this study is useful for all the clinicians for proper identification and treatment of illness. Therefore, early prenatal ultrasonographic identification of these anomalies helps in reducing risk in maternal and perinatal outcome.

Table 1: Various types of umbilical cord attachment

S. No.	Various types of umbilical cord attachment	Total No. of Placenta Studied	Percentage
1	Central	65	65
2	Eccentric	17	17
3	Battledore (Marginal)	11	11
4	Velamentous (membranous)	5	5
5	Furcate

Table 2: Comparison of various types of umbilical cord attachment with previous studies.

S. No	Authors	No of placenta studied	Central (%)	Eccentric (%)	Battledore (Marginal) (%)	Velamentous (Membranous) (%)	Furcate (%)
1	Donald N <i>et al.</i> [11] (1988)	54	70.37	--	22.22	7.41	--
2	Sepulveda W <i>et al.</i> [12] (2003)	825	93	--	5.21	0.96	--
3	Manikanta R <i>et al.</i> [13] (2012)	110	75.45	--	16.36	0.9	7.27
4	Yousuf <i>et al.</i> [7] (2015)	150	24	66	2	8	--
5	Shrivastava S <i>et al.</i> [14] (2018)	78	32.05	57.6	8.97	--	1.28
6	Arora NK <i>et al.</i> [15] (2016)	32	18.75	59.38	15.62	3.12	3.12
7	Jeyasingh T <i>et al.</i> [6]	50	22	70	8	--	--

	(2016)						
8	Present study	100	68	16	12	4	--



Fig 1: Central attachment of umbilical cord.



Fig 2: Eccentric attachment of umbilical cord.



Fig 3: Battledoor attachment of umbilical cord.



Fig 4: Velamentous attachment of umbilical cord

Fig 1-4: Types of attachment of umbilical cord.

References

1. <https://en.wikipedia.org/wiki/Placenta>
2. https://en.wikipedia.org/wiki/Umbilical_cord
3. Hiralal K. DC Dutta's textbook of Obstetrics. 8th edn. The health sciences publisher, New Delhi, 2016, 32-44.
4. Standring S Gray's Anatomy-The Anatomical Basis of Clinical Practice. 40th edn. Churchill Living stone, Elsevier, New York, USA, 2008, 1303.
5. <https://radiopaedia.org/articles/variation-in-cordinserion>
6. Jeysingh T, Rohinidevi M, Vimala V. Variations in the placental attachment of umbilical cord and its embryological significance. IOSR Journal of dental and medical sciences, 2016;15(3)7:101-103.
7. Yousuf MS, Tarannum Y, Naval KP. Variations in the placental attachment of umbilical cord and its clinical significance. Journal of medical and dental sciences, 2015;4(70):1-7.
8. Baergen RN. Pathology of the Umbilical Cord. Manual of Pathology of the Human Placenta. 2nd edn, Springer Science & Business Media, New York, 2011.
9. Benirschke K. Manual of pathology of the human placental. 2nd edn. Spinger Science & Business Media, New York, 2011.
10. Hubinont C, Lewi L, Bernard P, Marbaix E, Debieve F, Jauniaux E. Anomalies of the placenta and umbilical cord in cord gestations. Am J Obstet Gynecol. 2015;213(4):S91-S102.
11. Donald N, Di Salvo, Carol B, Benson Faye C. Laing. Sonographic evaluation of the placental cord insertion site. American journal of radiology. 1988;170:1295-1298
12. Sepulveda WI, Rojas JA, Robert *et al*. Placental detection of velamentous insertion of umbilical cord: a prospective colour Doppler ultrasound study. Ultrasound Obstet Gynecol, 2003; 21:564- 569. [13] Manikanta R, Geetha S P, Nim V K. Variations in placental attachment of umbilical cord. J Anat. Soc. India. 2012;61(1):1-4.

13. Shrivastava S, Mishra B, Sudhakar KR, Shrivastava VK, Shivhare PR. Variation of human placental attachment of umbilical cord. International Journal of Scientific Study. April. 2018;6(1):17-20.
14. Arora NK, Khan AZ, Haque M, Srivastava S, Farden Q. Variations in placental attachment of umbilical cord. Annals of International Medical and Dental Research. 2016;2(1):110-12.