

Study of Length and Diameter of Umbilical Cord and Its Embryological Significance.

Dr.Sonal Kulshreshtha^[1], Dr. Sudhir Saxena^[2],

¹Associate Professor, Department of Obstetrics & Gynecology Gajra Raja Medical College, Gwalior (MP)

²Associate Professor, Department of Anatomy Gajra Raja Medical College, Gwalior (MP)

Corresponding author: Dr.Sonal Kulshreshtha

Abstract –

Introduction: The placenta is a vital organ which is absolutely essential to the survive, growth, development and well being of the foetus. Placenta is a focus of increasing interest in modern obstetrics because significant pathology afflicts the placenta, often before affecting the foetus. Placental abnormalities, therefore, can be an “early warning system” for foetal problems. **Aims:** study of length and diameter of umbilical cord and its embryological significance **Material and Methods:** 130 placentas, umbilical cords and neonates constitute the material for the study. The mothers delivered at Kamla Raja Hospital, Gwalior, associated with G.R. Medical College were considered for the study. **Result and discussion:** In the present study the total length of the umbilical cord from the fetal end to placental end were measured. The maximum length was 74.2 cm and minimum length was 18.5 cms. The maximum transverse diameter of the cord was 2.8cm and minimum was 1.2cm. **Conclusion:** Knowledge about the variation in the length and diameter of umbilical cord is important for, obstetricians, radiologist and pediatricians for preventing the intrauterine death and various abnormalities.

Keywords: Placenta, Umbilical cord, , Length of the cord,

Date of Submission: 20-05-2018

Date of acceptance: 04-06-2018

I. Introduction :

Placenta was referred to as “after birth”, “external soul” of life in ancient Egyptian, Indian and Biblical texts. Umbilical cord is usually 1-2 cm in diameter and 30-90 cm in length (Moore K.L.2003). Human placenta is expelled as a flattened discoidal mass with an approximately circular or oval outline, with an average weight about 500 gms (range 200-800 gms), average diameter 18.5 cms (range 1.5-2 cms) average thickness 2-3 cms (1-4 cms) The contents of umbilical cord are left umbilical vein, right and left umbilical arteries with differentiation of nerves in the extra embryonic mesoderm. The allantois and vitello- intestinal duct are incorporated at its fetal end. It is thick at the center and rapidly diminishes in thickness towards the periphery.the human placenta is chorio-allantoic since it is vascularized by vessels. Haemo-choroidal because of nature of its membrane, villous because of its villi, deciduous because maternal deciduas is shed after birth. According to Tropin (1965) almost all discoidal placentas at term cover one fifth to one fourth of the area of uterine cavity wall. The complication during delivery of the fetus, any malformation of the fetus, prenatal and postnatal complications in mother is attributed to the umbilical cord abnormalities and its variation. Any variation in length, vessels pattern may lead to intrauterine death and other abnormalities like renal aplasia, congenital trachea esophageal fistula and chromosomal abnormalities.

II. Material And Methods :

130 placentas, umbilical cords and neonates constitute the material for the study. The mothers delivered at Kamla Raja Hospital, Gwalior, associated with G.R. Medical College, Gwalior were considered for the study. Every minor detail was penned down and the code number given. The placentas and the umbilical cord were collected and identified and then brought adequately to the department of Anatomy for detailed study without any loss of time and well preserved. After collection each placenta was examined immediately. It was washed with normal saline. On initial examination The length of the cord, diameter of the cord, cord coiling, presence of knots and the vascular pattern were studied. The length of the cord was measured from the cut end of the cord up to its placental attachment and with this reading 5 cm was added for the umbilical cord which was uniformly left towards fetal end. Diameter of the cord was measured with the help of Vernier caliper. The presence of cord coiling, presence of true and false knots was also observed.

III. Observations –

Table no 1(a) showing the length of umbilical cord

S.NO	LENGTH (cms)	NO. OF UMBILICAL CORD	%
1	70-80	2	1.56
2	60-70	3	2.31
3	50-60	8	6.12
4	40-50	15	11.53
5	30-40	40	30.76
6	20-30	36	27.69
7	10-20	26	20

Table no 1(b) showing the length of umbilical cord

Length of umbilical cord	In cms
Maximum length of umbilical cord	74.2
Minimum length of umbilical cord	18.5
Mean length of umbilical cord	38.7

The above table shows that the length of umbilical cord was variable from 18.5 cms(shortest cord) to the longest umbilical cord measured was 74.2cms the mean length of the umbilical cord was calculated to be 38.7 cms.median and mode were 31.65 and 19.2 cms. Standard deviation was 13.34 and standard error was 1.25

Table no 2 (a) showing the diameter of umbilical cord

S.NO	Diameter in cms	No. of umbilical cord	%
1	2.6-3	5	3.84
2	2.1-2.5	27	20.76
3	1.6-2.0	66	50.76
4	1.0-1.5	32	24.61

Table no 2 (b) showing the diameter of umbilical cord

diameter of umbilical cord	In cms
Maximum diameter of umbilical cord	2.8
Minimum diameter of umbilical cord	1.2
Mean diameter of umbilical cord	1.72

The diameter of umbilical cord in the present study was found to range from 1.2 cms to 2.8 cms. The mean diameter was calculated to be 1.72 cms. The umbilical cord having diameter less than 1.5 cms were 24.61% while umbilical cord having more than 2.5 cms diameter were only 3.84 %. The variance of all values is 0.18 , standard deviation is 0.43 and standard error is 0.038.

IV. Discussion

According to Standring in Gray's Anatomy 40th edition the mean length of the cord is 50cm. But the length may vary from 20 to 120cm (2008). According to Shunji Suzuki et al, the normal length of the umbilical cord was 45-68cm.(2012)

V. Conclusion

Knowledge about the variation in the length and diameters of umbilical cord is important for sonologists, obstetricians and pediatricians since any variation in length, diameters may lead to intrauterine death and other abnormalities like renal aplasia, congenital trachea-esophageal fistula and chromosomal abnormalities.

References

- [1]. Shunji S, Yukiko F. Length of the Umbilical Cord and Perinatal Outcomes in Japanese Singleton Pregnancies Delivered at Greater Than or Equal to 34 Weeks' Gestation. J Clin Gynecol Obstet. 2012;1(4-5):5762.
- [2]. Standring S, Borley NR, Collins P et al.Gray's Anatomy: The Anatomical Basis of Clinical Practice-Pleura, lungs, trachea and bronchi.40th ed.Spain:Churchill Livingstone; 2008:182
- [3]. Moore K.L, Persaud T.V.N (2003): the developing Human ; y Oriented embryology 7th Ed. .
- [4]. Tropin R.(1965): Novek's : Gynaecological and Obstetrical pathology, 8th ed. (1979). Scynder Co. Philaldephia P.632.

Sarika Singh." Premature Rupture of Membrane Its Factors and Maternal Outcome."IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 5, 2018, pp 49-50.