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Original Research Article

A Study on Morphometry of Spleen in Aborted Foetuses in Relation to Gestational Age

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Abstract

Background: Spleen is an essential organ due to its significant role in immunological and haematological functions of the body. Splenic notches on various borders establish the lobulation of the spleen in early life. ***Aim:*** To study the morphological and morphometric parameters of the spleen in aborted foetuses ***Materials and Methods:*** 30 foetal spleen specimens (Male-14; Female-16) of both sexes from 12-40 weeks of gestational age were obtained from the Department of Anatomy, Santhiram Medical College, Nandyal. The morphometric parameters like length, width, thickness and weight of the foetal spleen were measured and recorded ***Results:*** The incidence of wedge shape was 23 (76.66%), the pyramidal shape was 6(20%), and leaf-shaped was 1(3.33%). The incidence of the single notch was observed in 19 (63.33%), two notches in 9(30%), and three notches in 2(6.66%) specimens were found in the present study. The parameters like length, width, thickness, and weight of the fetal spleen were increased in relation to the gestational age in the present study. ***Conclusion:*** The present study acknowledges the anatomical and morphological basis of the spleen may be helpful for the surgeons while doing partial splenectomy in the removal of the affected segment by ligating the segmental branch of the splenic artery.

Keywords: Morphometry, notch, shape, spleen.

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INTRODUCTION

Spleen is located in the left hypochondrium and partly in the epigastric region of the abdomen between the fundus of the stomach and the diaphragm [1]. Accessory spleens may be located within the gastrosplenic ligament and at the hilum of the spleen or occasionally, within the greater omentum and rarely left spermatic cord. The stomach and left colic flexure influence the shape of the spleen and three morphological types are desired [2]. The shape of the spleen is crescentic, rhomboid and triangular [3, 4]. The size of spleen varies with age, with the individual and in the same individual under different conditions [5]. Spleen has diaphragmatic and visceral surfaces, superior and anterior borders and inferior and posterior extremities [6]. There is limited research about the sizes of the foetal spleen and infant spleen at 6th week. The length of the spleen is 10mm [5]. The present study was aimed to study the morphological and morphometric parameters of the spleen in aborted foetuses in relation to gestational age.

MATERIALS AND METHODS

A total of 30 foetal spleen specimens (Male-14; Female-16) obtained from the Department of Anatomy, Santhiram Medical College, Nandyal to study the morphological and morphometric parameters of the foetal spleen in relation to gestational age. The foetuses were of both the sexes and of 12 – 40 weeks of gestational age. The foetuses were preserved by injecting 10%forma line solution into the pleural, peritoneal and the cranial cavities. External features of the foetuses and visible anomalies if any were recorded. The morphological parameters like shape, colours were noted, and the morphometric parameters like length, width and thickness of the kidneys by using vernier callipers and recorded. The specimens were categorized into 0-12 weeks, 12-24 weeks, 24-36weeks and >36 weeks of gestational ages. The shapes of the spleen, the number of notches were recorded. Morphometric measurements of fetal spleens were taken with the help of vernier calliper. The weight of the spleens was measured by using a weighing scale. The length of the spleen measured as the distance between the anterior and posterior extremities. The width of the spleen measured as the distance between the superior and inferior borders. The thickness of the spleen measured

as the distance between the superior and inferior borders.

RESULTS

All the foetal spleen specimens were reddish-brown colour in our study. Out of 30 foetal spleen specimens, 23 specimens were wedge-shaped, and six specimens were pyramidal, and one specimen was leaf-shaped observed in the present study [Table-1]. The incidence of wedge shape was 23(76.66%), the pyramidal shape was 6(20%), and leaf-shaped was 1(3.33%). The incidence of the single notch was observed in 19(63.33%), two notches in 9(30%), and three notches in 2(6.66%) specimens were observed in the present study. The weight of the fetal spleen was 0.02 ± 0.01gm in 0-12 weeks, 0.53± 0.048gm in 12-24 weeks, 1.91 ± 0.07gm in 24-36weeks, and 4.09 ± 0.08gm in > 36 weeks of gestational ages respectively. The length of fetal spleen was 5.95 ± 0.03mm, the width was 2.96 ± 0.35 mm, and thickness was 2.15 ± 0.62 mm in 0-12 weeks of gestational age group fetuses. The length of fetal spleen was 11.73 ± 0.61 mm, the width was 6.79± 1.18 mm, and thickness was 5.21 ± 0.58 mm in 12-24 weeks of gestational age group fetuses. The length of fetal spleen was 20.07 ± 1.24 mm, the width was 12.92± 0.62 mm, and thickness was 9.264 ± 0.66 mm in 24-36 weeks of gestational age group fetuses. In >36 weeks of gestational age group fetuses, the length of fetal spleen was 22.41 ± 0.90 mm, the width was 15.65± 0.63 mm, and thickness was 10.66 ± 0.63 mm noted in the present study[Table-2].

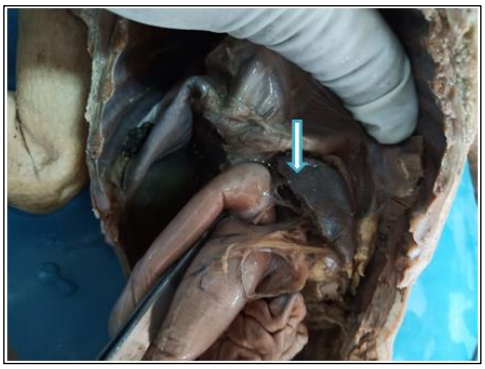

Fig-1: location of spleen in left hypochondrium in aborted fetus insitu

Table-1: Distribution of shape of the fetal spleen in our study

S.No	Shape of the spleen	Number of specimens
1	Wedge	23
2	Pyramidal	6
4	Leaf shaped	1

Table-2: Morphometric parameters of the fetal spleen in our study

Gestational age (Weeks)	Meadn±Sd			
	Length(mm)	Width(mm)	Thickness(mm)	Weight of spleen (Gms)
0-12 weeks	5.95 ± 0.03	2.96 ± 0.35	2.15 ± 0.62	0.02 ± 0.01
12-24 weeks	11.73 ± 0.61	6.79± 1.18	5.21 ± 0.58	0.53± 0.048
24-36 weeks	20.07 ± 1.24	12.92± 0.62	9.264 ± 0.66	1.91 ± 0.07
>36 weeks	22.41 ± 0.90	15.65± 0.63	10.66 ± 0.63	4.09 ± 0.08

DISCUSSION

The location of spleen was observed in left hypochondrium of the abdomen in all the fetuses (Figure-1) in our study in agreement with previous literature [6]. Development and morphometry of spleen studied by the use of ultrasonography in the majority of the studies [7,8].There was a difference in morphometric parameters of spleens between alive and dead subjects [9]. Three faced wedge-shaped fetal spleen in 60% cases; four-faced in 36.5% and two-faced in 3.5% cases [10]. The length, width and thickness of fetal spleen was 1.4 cm, 1.1 cm and 0.8 cm in 12 to 24-week fetuses and 2.4 cm, 1.5 cm and 1.0 cm in 25 to 36-week fetuses[11]. Higher values of dimensions of the fetal spleen as compared to our study probably because of fresh fetuses [12,13]. The size of the spleen increases very rapidly in the embryo from about 6th month [14]. The difference in the dimensions of the fetal spleen in our study may be due to the consideration of differential age group and number of fetuses collected for the study. Morphometric parameters of the fetal spleen in our study are increasing in relation to the gestational age of the fetuses was significant in our study, which is in agreement with previous literature [4]. Limited literature is available on morphometric parameters of the fetal spleen; the research needs to be extended on an increasing number of specimens in relation to each age group may help us in better understanding the morphometry of the spleen for future prospects of the study [15,16].

CONCLUSION

Our study acknowledges the morphological and morphometric parameters of the spleen may be helpful to the clinicians, radiologist and surgeons while doing partial splenectomy in the removal of the affected segment by ligating the segmental branch of the splenic artery.

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