A Cadaveric Study on Morphometric Features of Spleen and Splenomegaly with Accessory Spleen in Hilum
Khaleel N1, Abinet GM2, Angadi A V3, Muralidhar P S4, Shabiya M5, Shaik Hussain Saheb *6.

1,2 Associate Professor, Assistant professor and & HOD, Department of Anatomy College of Medicine and Health sciences, Arba Minch University, Arba Minch, Ethiopia.
3 Professor & HOD, Department of Anatomy, SSIMS & RC, Davanagere, Karnataka, India.
4 Associate Professor of Anatomy, GIMS, Gulbarga, Karnataka, India.
5 Associate Professor, Kasukurthi Health Care Pvt Ltd, Bangalore, Karnataka, India.
6 Associate Professor of Anatomy, SSIMS & RC, Davanagere, Karnataka, India.

ABSTRACT

Background: Anatomical knowledge regarding the external morphology of the spleen is essential for surgical intervention and radiological diagnosis. Splenomegaly is defined as pathologic enlargement of the spleen measured by size or weight. A normal spleen has a craniocaudal length of no more than 12 cm and weighs less than 200 g. It is surrounded by a thin capsule. The spleen is usually not palpable unless it is enlarged; therefore, a palpable spleen is almost always abnormal. At times the spleen may be difficult to palpate, but dullness to percussion during inspiration in the area of the lower left intercostal space in the left anterior axillary line suggests splenic enlargement. Massive splenomegaly, weight >1000 g usually occurs in lymphoma, myeloproliferative disorders, visceral leishmaniasis, and malaria.

Materials and Methods: This study was conducted in different medical institutions, to find morphometric features, splenomegaly in cadaver during routine anatomy dissection as part of curriculum, 100 cadavers were observed to find out splenomegaly.

Results: Out of 100 spleens studied, 81 cases wedge shaped spleen was the most common, followed by 12 tetrahedral shaped spleens and 7 oval shaped spleens. Average weight of the spleen was 175g. Average length of the spleen was 11.64cm, Average breadth of the spleen was 7.3cm and average thickness of spleen was 3.6cm. Out of 100 cadavers observed only one cadaver observed with massive splenomegaly with one accessory spleen in hilum. The spleen weight was 875gm, length was 18.15 cm, width was 8.65cm, thickness was 5.75cm and extended upto 7 rib and it is easily palpable below the rib cage from lumbar aspect. The cadaver was male and age around 55 years.

Conclusion: The morphometric knowledge of spleen will helpful for surgeons and for understanding deceases related spleen. The knowledge of splenomegaly is important in finding splenic disorders and accessory spleen information helpful in understanding embryonic development of spleen.

KEY WORDS: Splenomegaly, Spleen, Hilum of Spleen, Accessory spleen.

原创研究文章

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Conclusion: The morphometric knowledge of spleen will helpful for surgeons and for understanding deceases related spleen. The knowledge of splenomegaly is important in finding splenic disorders and accessory spleen information helpful in understanding embryonic development of spleen.

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Loss. Splenomegaly can usually be diagnosed through palpation during a physical exam and with help of MRI & CT scan. Treatment of splenomegaly primarily focuses on treating the underlying cause. In certain cases, such as with massive splenomegaly caused by cancer, splenectomy, or the removal of the spleen, may be required[4,5]. The aim of present study is to find morphometric measurements of spleen and Splenomegaly in cadaver and measurements of it.

MATERIALS AND METHODS

This study was conducted in different medical institutions, to find the morphometric measurements of spleen, and to find splenomegaly in cadaver during routine anatomy dissection as part of curriculum, 100 cadavers were observed to find out splenomegaly. The cadaver was observed before starting of abdominal dissection. Abdominal palpation was done for finding enlargement of spleen. After finding the spleen with excessive enlargement, the spleen was collected and measured weight, length, width and thickness and observed for accessory spleen in its hilum. The findings were recorded.

RESULTS

| Measurement of the spleen | Weight  | Length  | Breadth | Thickness |
|--------------------------|---------|---------|---------|-----------|
| Weight                   | 192g    | 11.64cm | 7.3cm   | 3.6cm     |

Out of 100 cadavers observed in different medical colleges during routine anatomy dissection as part of curriculum. Out of 100 spleens studied, 81 cases wedge shaped spleen was the most common, followed by 12 tetrahedral shaped spleens and 7 oval shaped spleens. Average weight of the spleen was 192g. Average length of the spleen was 11.64cm, Average breadth of the spleen was 7.3cm and average thickness of spleen was 3.6cm (Table 1). Only one cadaver observed with massive splenomegaly with one accessory spleen in hilum. The spleen weight was 875gm, length was 18.15 cm, width was 8.65cm, thickness was 5.75cm and extended upto 7 rib.
and it is easily palpable below the rib cage from lumbar aspect (Figures 1,2,3). The cadaver was male and age around 55 years.

**Fig. 1:** Showing the spleen with excessive enlargement and accessory spleen in hilum

**Fig. 2:** Showing enlarged spleen, accessory spleen in hilum and impressive splenic notches.

**Fig. 3:** Showing the diaphragmatic surface with costal impressions.

**DISCUSSION**

The spleen develops from both coelomic epithelium and from mesenchyme of dorsal mesogastrium. During development several lobules form which fused with each other to form the spleen at later stage. In adult the notched superior border of spleen is a foot print of lobulated development of spleen in embryonic period [6,7]. The shape of the spleen varies from wedge, tetrahedral and oval, the shape of the spleen depends on neighbouring structures during development and fusion of multiple spleniculi[1].

In the present study we have recorded different shapes of spleens that are wedge shaped 81%, and it is most common, followed by tetrahedral 12% cases, and oval were 7% of spleens. The previous studies also reported about shapes of spleens but all were reported different values in relation with shapes. In the present study different dimensions of spleens were studied like length, width and thickness. The average length of the spleen was 11.64cm, average breadth of the spleen was 7.3cm and average thickness of spleen was 3.6cm. In the present study average weight of the spleen was 195g. The value related to dimensions were in correlation with previous studies. The splenic notches were observed in most of the cases on superior border and near the anterior end [7,8,9,10,11,12,13,14].

Splenomegaly is defined as enlargement of the spleen measured by weight or size. The spleen plays a significant role in hematopoiesis and immunosurveillance. The major functions of the spleen include clearance of senescent and abnormal erythrocytes. Approximately one-third of circulating platelets are stored in the spleen. The normal position of the spleen is within the peritoneal cavity in the left upper quadrant adjacent to ribs 9 through 11. The normal-sized spleen abuts the stomach, colon, and left kidney. The size and weight of spleen may vary and correlates with weight, height, and sex of an individual, with larger spleen size seen in men compared to women, and in heavier or taller individuals. A normally sized spleen measures up to 12 cm in craniocaudal length. A length of 12 cm to 20 cm indicates splenomegaly, and a length greater than 20 cm is definitive of massive splenomegaly. The normal weight of the adult spleen is 70 g to 200 g; a spleen weight of 400 g to 500 g indicates splenomegaly and spleen weight greater than 1000 g is definitive of massive
splenomegaly. The normal-sized spleen is usually not palpable in adults. However, it may be palpable due to variations in body habitus and chest wall anatomy. Splenomegaly may be diagnosed clinically or radiographically using ultrasound, CT imaging, or MRI. Splenomegaly may be a transient condition due to acute illness or may be due to serious underlying acute or chronic pathology. In present study we have found one case with excessive enlargement of spleen, the spleen weight was 875gm, length was 18.15 cm, width was 8.65cm, thickness was 5.75cm and extended upto 7 rib and it is easily palpable below the rib cage from lumbar aspect. The cadaver was male and age around 55 years. This values are in corelation with previous studies. [15,16,17,18,19]. The knowledge of the anatomy and function of the spleen is helpful for the understand of its role in disease. Studies on the morphometry of spleen will be helpful to surgeons and interventional radiologists.

Conflicts of Interests: None

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