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Original Research Paper

Anatomy

LOBULATIONS OF SPLEEN : A CASE STUDY

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ABSTRACT The spleen filters unwanted materials from blood. In pre-natal life the spleen manufactures erythrocytes and post-natal period, spleen manufactures erythrocytes prenatal life and destroys aged RBCs in post-natal life, apart from producing lymphocytes. The spleen performs hematological and immunological functions. The spleen shows various notches along its borders except intermediate border. These notches represent the fetal lobulated spleen. The findings of the present research study will be of fundamental importance to the surgeons, radiologists, and anatomists. The present research study denotes a human cadaveric multilobulated spleen. In the present study, the spleen from fifty embalmed cadavers was collected during routine dissection in, Department of Anatomy, Karuna Medical College Vilayodi, Palakkad 678103, Kerala, India.

KEYWORDS : Spleen, Splenic notches, lobulated spleen, Borders of spleen.

INTRODUCTION

The spleen has the following surfaces namely diaphragmatic and visceral surface. spleen has two poles, i.e anterior and the posterior poles. spleen has two borders, superior and inferior (Chaware et al., 2012). The diaphragmatic surface is convex and smooth. The visceral surface is irregular, and is marked by gastric, renal, colic, and pancreatic impressions created by related organs in embalmed cadavers. The spleen is related to left 9th, 10th, and 11th ribs (Patil et al., 2014). The shape of the spleen varies from a curved wedge, triangular, to a domed tetrahedron (Gandhi and Chavan, 2013). The spleen is suspended in the upper left quadrant of the abdominal cavity between the fundus of the stomach and the diaphragm.

The size and weight of the spleen vary with age, pathology, filtration process which it undergoes. In adults; it is approximately 12 cm long, 7 cm broad and 3-4 cm wide. Its average adult weight is 150 g, the normal range is wide, between 80 and 300 g (Nayak et al., 2014).

According to previous reports the superior border, there may be one or two notches, persisting from the lobulated form of the spleen in early fetal life (Yildiz et al., 2013). The additional collection of fully functional splenic tissue which are totally detached from spleen may exist near the spleen, which is called as the accessory spleen. Accessory spleens are found at the hilum of the spleen, in the gastrosplenic ligament and in the lienorenal ligament in the greater omentum (Kumari et al., 2014).

The spleen develops from the mesoderm. Numerous lobules fuses with each other in the form of the lobulations. in adult spleen that can be seen on the superior as well as on the inferior borders. The number of notches varies from 0 to 6, and commonly, one or two notches are seen.

MATERIALS AND METHOD

The morphological features of the spleen were measured. The shape, poles, borders, surfaces, and the impressions 0f related organs on the spleen were observed. Accessory splenic tissues, if they were present, were noted. To dissect the spleen from the abdominal cavity, they were detached from their various attachments, and the splenic vessels were cut near the hilum after ligation. En masse removal of abdominal viscera was carried out. The dissected spleen was washed in water. The shape of the spleen was noted.

The spleen was weighed on an electronic weighing machine and their lengths, breadths, and widths were measured. We considered the greatest distance between the two poles of the spleen as its length, the greatest distance between two points at the same level on the superior and inferior borders as its breadth and the greatest width as the width of the spleen. The values were measured using wernier calipers. The data which was thus obtained was analyzed and compared with that of previous studies.

OBSERVATION

A lobulated spleen with multiple hila and fissures were procured from undergraduate dissection study. The study was done in the Department of Anatomy Karuna Medical College Vilayodi, Palakkad 678103, Kerala, India. The diaphragmatic surface of the spleen showed a uniform morphology while its visceral surface showed cadaveric impressions of gastric, renal, colic, and pancreas. The anatomical splenic notches were present on the superior as well as on the inferior borders. The spleens apparently looked healthy with a light purple/pinkish gray color. Specimen I was 3.5 cm thick, 8 cm broad, and 13 cm long and specimen II was 4 cm thick, 8cm broad, and 14 cm long. In specimen the hilum of the spleen was divided into three parts, and all the three parts allowed the passage of individual branches of the splenic vessels.

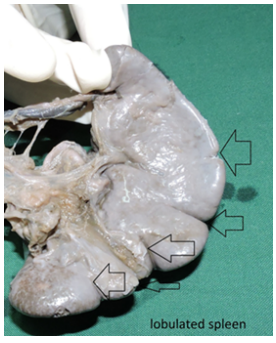

Figure 1: Specimen indicating lobulations in Spleen.

The specimen had the largest division of the hilum which was situated at highest above the intermediate border near the anterior end of the spleen. The other two hila were situated closer to the intermediate border of the spleen on the visceral surface. Upper border of the spleen presented three fissures. The lower border of the spleen also featured three fissures. Most of these fissures were seen on both visceral and diaphragmatic surfaces of the spleen.

The fissure pattern of the specimen was represented as a notch in diaphragmatic surface. Two fissures from superior border were deep and directed downward. The visceral peritoneum of the spleens extended completely till the bottom of all the fissures in both specimens. Because of the presence of these fissures, the spleen had a characteristic multilobulated appearance with distinct lobes/lobules. The splenic notches were found on the superior as

well as on the inferior borders. The number of notches seen was upto six, but commonly, there were only one or two notches.

DISCUSSION

The spleens variations might result in diagnostic pitfalls (Setty and Katikireddi, 2013). The spleen may retain its fetal lobulated patterns. In splenomegaly the anterior end and diaphragmatic surface may become palpable below left costal margin. The notches if present are often exaggerated and may be easily palpable. The inferior border may become palpable below left costal margin.

Splenomegaly is common in the case of malaria, typhoid, and leukemia. When the spleen is enlarged, it enlarges toward the umbilicus and right iliac fossa. Surgeons used to do segmental splenectomy. However, the importance of the spleen in protection from infection, and it was thought that the other lymphatic organs of the body could take over spleen's functions. However, a series of recent animal experiments and patients' follow-up studies revealed its actual importance in protection from blood born sepsis, where its role as a blood filter was found to be significant (Alshukry, 2008). Thus, the knowledge of the variational anatomy of the spleen is of fundamental importance.

CONCLUSION

Splenic notches are very common on the superior border than on the inferior border, thus essential for the surgeons and radiologists to be aware of the variations that help in clinical diagnosis. The appearance of fissures on the spleen may mislead the surgeons as a traumatic injury.

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