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Original Research Article

A Cadaveric Study of Human Splenic Notches and Fissures

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ABSTRACT

Aim/Objectives: To study the splenic notches and fissures in human cadaver and compare them with the previous studies.
Materials and Methods: A total number of 50 human cadaveric spleens were selected. Features like the notches, fissures on the superior, inferior borders on diaphragmatic and visceral surfaces were studied.
Results: Out of fifty cases, forty two (84%) were with notches and eight (16%) were without notches. Among the forty two, thirty five (70%) spleens displayed notches on the superior border. The number of notches varied from one to four. Seven (14%) spleens displayed notches on the inferior border. The number of notches varied from zero to one. Eight (16%) of spleens did not show notches either on superior or inferior border or on the surfaces. 2% spleens displayed fissures on the diaphragmatic surface.
Conclusion: The presence of notches both on the superior and inferior borders of spleen could be considered as an important morphological significance as far as spleen's structural and functional anatomy is concerned. Present study findings could improve the knowledge of medical professionals, especially anatomists, in their routine class room dissections, for the surgeons in the diagnosis of various diseases of spleen and for the radiologists interpreting the CT scans.

Key words: Notches, Fissures, Spleen, Borders

INTRODUCTION

Spleen consists of a large encapsulated mass of vascular and lymphoid tissue located in the abdomen's upper left quadrant between the diaphragm and fundus of the stomach. [1] It is a derivative of mesenchymal cells that are localized between the dorsal mesogastrium layers. During the fetal life, although spleen occurs in a lobulated form, lobules disappear prior to the child birth. In adult spleen, notches in the superior border are considered as the remains of the grooves from where the fetal lobules have undergone separation. [2]

Spleen was earlier thought to be insignificant. But, growing awareness of its clinical and functional role had furnished much in sights on the conservative strategies in managing conditions associated with spleen. [3] Normally, spleen is not palpable, but it undergoes
Enlargement in diseases almost twice its normal size, to become clinically palpable under left coastal margin. Spleen enlarges

towards umbilicus and reaches right iliac fossa. [4] Splenic notches when become palpated on superior border could indicate an abnormally enlarged spleen, an important clinical sign. Spleen interpretation performed through imaging techniques like computed tomography (CT) scans also relies on the evaluation of splenic notches.

The current anatomical study describes the existence of notches on the superior and inferior borders of the spleen in relation to anomalous fissures that may be of utmost morphological and clinical importance.

MATERIALS AND METHODS

The present study was conducted in the Anatomy Department of Bhaskar Medical College, Yenkapally Village, Moinabad Mandal, Ranga Reddy district, Andhra Pradesh. After the routine dissections for undergraduate medical students, spleens were stored in stainless steel tanks containing 10% formalin. A total of 50 human adult cadaveric spleens were studied. Splenic notches and fissures were studied with regard to its topographical location. The data obtained was tabulated, analyzed statistically and compared with the previous studies.

RESULTS

Out of the 50 spleens studied, 35 (70%) exhibited splenic notches on the superior border (Fig 01), 7 (14%) exhibited splenic notches on the inferior border (Table 1/ Fig 02). 8 (16%) specimens did not show notches (Fig. 03). The average number of splenic notches on the superior border varied between 1 and 4. But the majority of the spleens showed notches that varied between 1 and 2 on the superior border. Rest of the spleens showed one notch on the inferior border.

Fig01. Superior border with single notch.

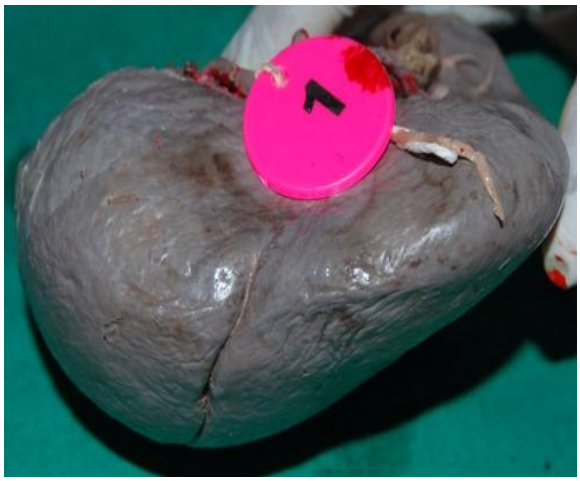

Fig02. Inferior border with single notch.

Table 1. No. of spleens with and without notches (n=50).

	N	%
No. of spleens with notches on the superior border	35	70%
No. of spleens with notches on the inferior border	7	14%
No. of spleens without notches	8	16%

Among those 35 spleen specimens with notches on the superior border, 14 showed 1 notch, 10 showed 2 notches, 3 showed 3 notches and 8 showed 4 notches. Among 7 spleen specimens, we observed only one notch on the inferior border. We also observed one fissure (Fig 04) measuring 50 mm in length on the diaphragmatic surface of the spleen extending into the visceral surface. The results obtained are displayed in (Table 1).

Fig 03. Spleen without notches.

Fig 04: Splen with fissure on diaphramatic surface .

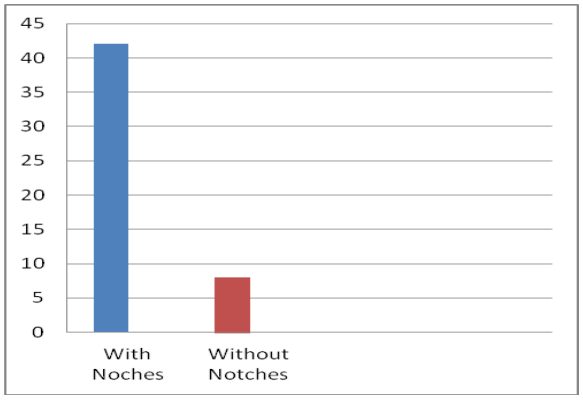

Fig .1: Spleens with and without Notches.

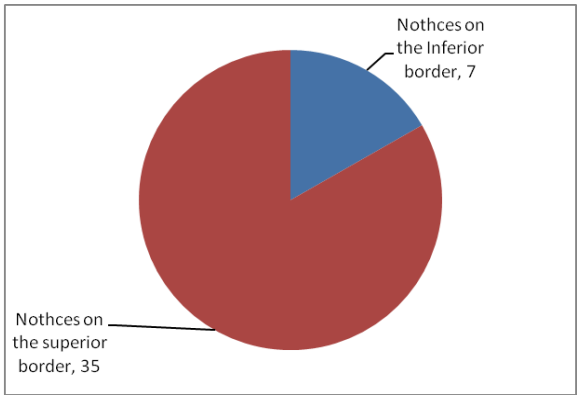

Fig .2. Spleens with notches on the inferior and Superior border.

DISCUSSION

In the early 20th century, spleen was considered as an insignificant organ. [5] But the importance of spleen has now increased because of its immunological and cytopoietic activity especially with regard to its R.B.C storage and blood filtration potential. [3] In this study, 70% of the spleens displayed notches on the superior border. In the previous studies, splenic notches in the superior border were observed in 70%, [6] 95%, [7] 78.6%, [8] of cases respectively. We observed splenic notches on the superior border only in 70% of cases which has coinciding with a previous study 6 (Soyluolu A Y).

In the present study, 14% of the splenic specimens exhibited notches on the

inferior border. In the previous study, the splenic notches on the inferior border were seen in 8% [9] and 2% (Srijit Das, 2008) cases respectively. Hence, our observation with regard to splenic notches on the inferior border does not coincide with the previous studies. Unnotched spleens are a characteristic feature of Rodents. [9] In the present study, there were 16% of UN notched spleens. This could mean that there was a perfect fusion of all the splenic nodules during its development. However, not much literature is available on the presence of UN notched spleens in human beings which is considered very rare. For cases related to unnotched spleens, surgeons may mislead splenomegaly as renal swelling on left coastal margin. But renal swelling had resonant sound on percussion, slight movement on respiration, ballotability, bimanually palpable and insinuation of the hand in between the renal swelling and anterior abdominal wall. Splenomegaly is common in case of malaria, kalazar, typhoid, syphilis, acute and chronic leukemias. In these common cases, the physician feels the notches of spleen on the superior border.

Further, we observed one fissure in a single spleen specimen (2%). It was 50 mm length, on the diaphragmatic surface extending to the visceral surface which may be considered rare. This feature may be due to developmental defect or due to mechanical pressure from the surrounding structures.

CONCLUSION

The presence of notches and fissures in the spleen are important for surgeons and radiologists in diagnosing various diseases. The appearance of fissures on the spleen may mislead the surgeons as a traumatic injury. It is essential for the surgeons and radiologists to become completely aware of anatomical variations that may help in accurate clinical diagnosis and treatment of the disease.

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