

Histomorphological spectrum in splenectomy specimens- A 5 year retrospective study

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Abstract

Objective: To study the pathology of splenectomy specimens in a tertiary care center.

Materials and Method: This is a non interventional 5 year retrospective study carried out in the PG Department of Pathology, GMC Jammu, from 1 January 2011 to 31 December 2016. Our study included 85 cases, slides & data for which were retrieved from the histopathology section & the slides reviewed by the authors.

Results: Out of 85 cases, 55 were males and 30 females, the M:F ratio being 1.83:1. The age of the patients ranged from 2 to 67 years of age, maximum number of patients were in the age group of 20-30 years(n=32), followed by age group of 30-40 years(n=23). Maximum number of cases were reported as traumatic spleen(n=56), followed by congestive splenomegaly(n=9), septic infarct(n=3), normal spleen with foci of congestion(n=4), hemorrhagic infarct(n=3), splenic abscess(n=2), tubercular splenic abscess(n=4) and one case each of hypersplenism, echinococcus granulosus, Chronic myelogenous leukemia (CML) and myeloid metaplasia. Only one case of malignancy i.e. CML was reported in our study.

Conclusion: Splenectomy as a surgery, is both therapeutic and diagnostic, however in our study, it was mostly therapeutic. Other treatment options like partial splenectomy or repair of the laceration should be done to avoid post splenectomy complications.

Keywords: Spleen, Splenectomy, Traumatic spleen.

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Introduction

Galen considered "spleen" as an organ of mystery. Spleen is the largest organ of the mononuclear phagocytic system and is involved in all systemic inflammations, generalized haematopoietic disorders as well as metabolic disturbances.⁽¹⁾ The weight of the spleen is 150gm and lies between 9th to 12th rib in a healthy adult and between fundus of the stomach and diaphragm. It is composed of red pulp(76-79%) and white pulp(5-20%) which are separated by a marginal zone. Spleen lies in the left hypochondrium, where it is not protected by the bony cage, making it more prone to traumatic injury. The incidence of traumatic rupture of the spleen increases due to rise in automobile accidents.^(2,3) Spleen is considered as a vestigial organ, not essential for life, so surgeons do not hesitate to perform splenectomy. The surgery is performed electively or as an emergency procedure secondary to blunt trauma to the abdomen. Indications of therapeutic splenectomy includes splenic rupture, hametological disorders, abscess, storage disorder, cyst, tumours, infiltrative disorders and certain miscellaneous conditions.⁽⁴⁾ However, the procedure should be avoided unless absolutely necessary as it can lead to complications. Removal of spleen exposes the patient to infections especially polysaccharide capsule bearing bacteria i.e. pneumococcal, hemophilus influenza and meningococcus. Splenectomy should be done whenever, the benefits outweigh the complications of splenectomy.

This study aims to study histomorphological spectrum of splenectomy patients along with correlation with age, sex and clinical diagnosis.

Materials and Method

This is a non interventional 5 year retrospective study carried out in the PG Department of Pathology, GMC Jammu, from 1 January 2011 to 31 December 2016. The indications of splenectomy along with other clinical details were recorded from the histopathological forms in the record section. The dimensions, weight, capsular features and other gross features were analysed from the grossing forms. A total of 85 cases were studied. Blocks and slides were retrieved and reviewed by two pathologists. Ethical clearance was taken by the ethical committee.

Results

Out of 85 cases, 55 were males and 30 females, the M:F ratio being 1.83:1. The age of the patients ranged from 2 to 67 years of age. The age distribution is depicted in Table 1.

Table 1

S. No	Age in years	Males	Females
1.	0-10	2	2
2.	10-20	6	4
3.	20-30	20	12
4.	30-40	16	7
5.	40-50	5	3
6.	50-60	4	1
7.	60 and above	2	1
	Total	55	30

The histomorphological distribution of various splenic lesions is depicted in Table 2.

Table 2

S. No	Histopathological diagnosis	Number	Percentage (%)
1.	Traumatic spleen	56	65.8
2.	Hemorrhagic infarct	3	3.5
3.	Septic infarct	3	3.5
4.	Tubercular splenic abscess	4	4.7
5.	Chronic myeloid leukemia	1	2.3
6.	Myeloid Metaplasia	1	1.2
7.	Hypersplenism	1	1.2
8.	Hydatid cyst of spleen	1	1.2
9.	Congestive splenomegaly	9	10.5
10.	Normal spleen with foci of congestion	4	4.7
11.	Splenic Abscess	2	2.3
	Total	85	100

Majority of the cases 65.8% (n=55) of splenectomy were indicated for trauma following road traffic accidents and blunt injury abdomen. The main clinical features were pain epigastric region, tenderness abdomen, pain being referred to left shoulder, features of hypovolemic shock. The main gross finding in cases of traumatic spleen were capsular rupture, laceration and haemorrhage while vascular congestion, necrosis and neutrophilic infiltrate at the ruptured area were the main microscopic findings. The specimen received for hematological disorders showed increase in size and weight. Splenectomy specimen diagnosed as a case of Chronic myelogenous leukemia measured 30×20×8 cm and weighed 2.75kg in a 50 year old female who presented with the clinical complaints of fatigue, listlessness, fever and pain abdomen. A case of myeloid metaplasia was reported in a 40 years old male who presented with hepatosplenomegaly with portal hypertension, with the spleen weighing 3.5 kg. Microscopic examination of spleen showed infiltration by immature cells including myelocytes and metamyelocytes along with megakaryocytes. A splenectomy specimen of a 5 year old female was received, who was a known case of thalassemia, with

history of 60 blood transfusions. Grossly the splenectomy specimen measured 13×6×5cm and weighed 750gm. Microscopy showed area of hemorrhage, congestion with heavy sprinkling of golden yellow pigment. It was reported as a case of hypersplenism. Cases of congestive splenomegaly, showed congestion of the red pulp, with marked sinusoidal dilatation, presence of gamma gandy bodies and fibrous thickening of the capsule. The cause of chronic venous congestion of the spleen was mainly portal hypertension due to cirrhosis and budd chairi syndrome, as per the patient's clinical details. One case showed the presence of echinococcus granulosus in both spleen and kidney in a 29 year old female. On gross examination the spleen showed pearl white hydatid cyst membrane. Microscopically acellular thick eosinophilic outer membrane and inner germinal layer were seen. Two cases were reported as a cases of splenic abscess, one in a 25 year old female and second in a 49 year old male, grossly spleen were moderately enlarged and heavy. Cut section revealed a thick walled cavity filled with pus. Microscopy showed acute inflammatory infiltrate comprising of both viable and degenerated polymorphs in a necrotic background. No epithelioid cell granulomas were identified in the smears examined. AFB stains were negative. Cases of septic infarct spleen showed the presence of pale infarct grossly, microscopy showed acute on chronic inflammatory infiltrate with areas of necrosis. Cases of hemorrhagic infarct presented with acute abdominal pain in the age group of 25-50 years, in two males and one female. Microscopy showed vascular congestion, hemorrhage and areas of necrosis. Four cases of granulomatous reaction in spleen were diagnosed in patients in the age group of 20-40 years of age. Three cases were diagnosed in males and one in female. Two of the four cases had history of pulmonary tuberculosis. Grossly spleen was moderately enlarged. Cut section showed multiple yellow white nodules scattered in the splenic parenchyma. Microscopy showed multinucleated giant cells, chronic inflammatory infiltrate in a necrotic background. Ziehl Neelson stain was done, which revealed the presence of acid fast bacilli, thus confirming the diagnosis of tuberculous splenic abscess.

The splenic sections were studied for any infectious pathology, particularly malaria, but were found to be negative.

Discussion

Many studies regarding splenic pathology have not been documented in literature in this region. This study reports histomorphological findings in 85 splenectomy specimens over a three a period of 5 years.

The spleen is the most commonly injured abdominal organ from non-penetrating injuries. Its location and anatomic features are primarily responsible for its susceptibility to injury from external forces.⁽⁵⁾

The aetiology of traumatic rupture of spleen include automobile accidents, fall from a height or on level ground, blows and kicks, athletic injuries, gunshot wounds and others. The non traumatic causes of splenic rupture include; infectious mononucleosis, Acquired Immune Deficiency Syndrome (AIDS), malignancies, peliosis, granulomas and infarct.

In our present study, out the 56 cases of traumatic spleen, 35 cases were due to road traffic accidents(RTA), 10 due to blunt trauma abdomen due to either fall from height, 5 cases were due to fall in bathroom especially in the elderly and 5 cases due to blunt trauma abdomen in fights (kicks and blows on abdomen) and 1 case was seen due to blunt trauma abdomen in a 56 year old lady due to kick by horse. In RTA, victims were both the pedestrians and occupants of vehicles. Maximum number of cases were adult males in the 2nd and 3rd decade. There were 36 males and 20 females. The male to female ratio was 1.8:1. The cause of such age and gender distribution in RTA associated traumatic spleen, was attributed to the fact that young males are into more physically demanding activities and their exposure to trauma is more in comparison to females of the same age group. This is in concordance with Al-Kindi H et al.⁽⁶⁾ The higher frequency of traumatic spleen in road traffic accidents and blunt trauma abdomen have also been reported in studies of Smith J et al.⁽⁷⁾ The age and gender distribution is similar to reported series in literature.⁽⁸⁻⁹⁾ Patel H et al⁽¹⁰⁾ (2016) did a study on 100 splenectomy specimens over a period of 1 year and reported maximum number of cases in the third decade(29%), with a slight male preponderance. The male to female ratio was 1.3:1. The most common cause of splenectomy was congestive splenomegaly followed by trauma. This variation may be due to the fact that due to less incidence of RTA in that region.

Splenic infarcts are result of tissue necrosis due to parenchymal ischemia due to disruption of blood supply to that area. Splenic infarction may also develop secondary to thromboembolism, infiltrating hematological disorders, cardiovascular disorders, autoimmune/ collagen tissue diseases, trauma, surgery (pancreatectomy or liver transplantation) or an infection.⁽¹¹⁾

The occurrence of myeloid tissue in extramedullary sites is known as Myeloid Metaplasia. It is clinicopathological syndrome characterized by extramedullary hematopoiesis in spleen, splenomegaly, hepatomegaly, presence of immature white and red cells in the peripheral blood film along with anaemia.

In our study we reported a case of myeloid metaplasia with myelofibrosis. In myeloid metaplasia with myelofibrosis i.e. MMM, splenomegaly is secondary to extramedullary hematopoiesis.⁽¹²⁾ Splenectomy directed management in MMM is done in drug resistant and drug failure cases. In a retrospective study by Tefri A et al (2000),⁽¹³⁾ 223 consecutive

splenectomies were done in MMM, the median spleen mass was 2700 g (range, 380-7735 g). Splenectomy in MMM does not alter the natural history of the disease but gives relief to the patients from spleen related symptoms.

Hypersplenism is a disorder which causes the spleen to rapidly and prematurely destroy blood cells. An enlarged spleen is one of the symptoms of hypersplenism.

In secondary hypersplenism, the underlying disease must be treated to prevent further sequestration or destruction blood cells, and possible spleen enlargement. Splenectomy should be the last resort. Splenectomy will correct the effects of low blood cell concentrations.

Conclusion

In our five year retrospective study on splenic pathology, traumatic spleen was most commonly encountered, particularly in association with RTA.

Splenectomy in our centre, was done as a therapeutic surgery, but less invasive procedures like FNAC or conservative procedures like partial splenectomy or repair of the lacerations should be encouraged particularly in children, to prevent the risk of overwhelming post splenectomy infections(OPSI).

References

1. Aster J C. Diseases of white blood cells, lymph nodes, spleen and thymus. In: Kumar V, Abbas AK, Fausto M. (Eds) Robbins and Cotran Pathologic basis of disease. Elsevier Saunders, Philadelphia, 7th Ed. 2005: Pp702-705.
2. Ameh E A, Chirdan L B, Nmadu PT. Blunt abdominal trauma in children: epidemiology, management and management problems in a developing country. Paediatric Surgery International. 2000;16:505-509.
3. AL-Kindi H, Devi L, George M. Splenic pathology in traumatic rupture of the spleen: A five year study. *Oman Medical Journal* 2009; 24(2):81-83.
4. Park AE, Godinez Jr. CD. Spleen. In: Schwartz's Principles of Surgery. 2010. p. Chapter 34.
5. Parsons L, Thompson JE. Traumatic rupture of the spleen from non-penetrating injuries. *Ann Surg* 1958 Feb;147(2):214-223.
6. AL-Kindi H, Devi L, George M. Splenic pathology in traumatic rupture of the spleen: A five year study. *Oman Medical Journal* 2009; 24(2):81-83.
7. Smith J, Caldwell E, D' Amours S, Jalaludin B, Surge M. Abdominal trauma: a disease in evolution. *ANZ Journal of Surgery*. 2005;75:790-794.
8. Adelusola K A, Osasan S A, Afolabi O A. Histopathological study and audit of the spleen in Nigerians. *Afr J Health Sci* 2007;14(3-4):195-200.
9. Khalid A, Ul Haque A, Naseem L. Spectrum of disease entities in splenectomy specimen. *International Journal of Pathology* 2006;4(2):88-93.
10. Patel H, Goswami H, Patel M. Histopathological study of splenectomy specimen with correlation with age, sex and cause of splenectomy. *BJKines NJbas*, Vol 8(2), Dec 2016.
11. O Engin, C Osman, BK Filiz, A Nurdan, AC Arif. *Turk J Emerg Med* 2015;15(2):96-99.

12. Koch CA, Li C-Y, Mesa RA, Tefferi A. Nonhepatosplenic extramedullary hematopoiesis: associated diseases, pathology, clinical course, and treatment. *Mayo Clin Proc.* 2003;78:1223-33.
13. Tefferi A, Mesa RA, Nagorney DM, Schroeder G, Silverstein MN. Splenectomy in myelofibrosis with myeloid metaplasia: a single-institution experience with 223 patients. *Blood.* 2000;95:2226-2233.