

Elective Splenectomy-Clinical Profile, Indications and Outcome in a Tertiary Care Centre

Bikram Basukala¹, Sitaram Ghosh², Sarang Bharati³

¹Resident, Department of Surgery, Armed Force Medical College, Pune, India

^{2,3}Professor, Associate Professor, Department of Surgery, Command Hospital Southern Command, Pune, India

Abstract: ***Introduction:** Elective splenectomy can be performed both by conventional open surgery as well as laparoscopically for various clinical conditions-benign to malignant. The elective splenectomy can be combined with various other procedures or it can be the part of other operations. **Aim:** The aim is to study the clinical profile, indication and their outcomes in the patients undergoing elective splenectomy. **Method:** This is a hospital based descriptive observational study auditing the elective splenectomies performed from 2014 to 2019 from prospectively maintained database. **Results:** Total of 57 patients studied, the most common indication is EHPVO. 49% and 44% cases were performed by open and laparoscopic approach respectively with 7% conversion rate. 40.36% of cases were combined with one or more additional procedures. The total morbidity rate was 24.56 % with slightly higher in open approach. **Conclusion:** The most common indication of elective splenectomy is EHPVO. Morbidities are in the form of well known complications. Though laparoscopic approach is favoured in elective splenectomy, the requirement of other procedures makes open approach still a preferred approach.*

Keywords: Elective splenectomy, EHPVO, hypersplenism, lienorenal shunt

1. Introduction

Elective splenectomy can be performed both by conventional open surgery as well as laparoscopically. The elective splenectomy can be combined with various other procedures or it can be the part of other operations such as distal pancreatectomy, total gastrectomy.

Haematological conditions like Idiopathic thrombocytopenic purpura (ITP), hemolytic anaemia, hereditary spherocytosis and cases of hypersplenism –primary or secondary have been the common indications of elective splenectomy. Nowadays malignant conditions such as leukemia and lymphoma are selectively treated with elective splenectomy when the spleen is primarily involved[1]. Various imaging modalities like computerised tomography have decreased the role of elective splenectomy as a part of the staging laparotomies for lymphoma which used to be common indication of elective splenectomy in the past. [2]

Splenectomised patients are at increased risks of septic complications particularly by encapsulated bacteria, the most important septic complication being overwhelming post splenectomy infection (OPSI) which is fulminating sepsis, meningitis or pneumonia caused by encapsulated bacteria.[3,4]

This study aims to study the clinical profile, indication and their outcomes in the patients undergoing elective splenectomy.

2. Material and methods

The study is a hospital based descriptive observational study auditing the elective splenectomies performed between 2014 to 2019 in a prospectively maintained database. All patients undergoing elective splenectomy during the study period was included in the study.

Preoperatively, patients were evaluated with detailed clinical history, physical examination and necessary investigations. A well informed consent was taken in written from the patients or parents in case of minor. All the patients undergoing elective splenectomies were vaccinated as per protocol before surgery. All the surgeries were performed by a team of gastro intestinal surgeons. The surgical approach was preoperatively planned depending upon the indications and surgical plan. The splenectomy was combined with various other procedures when indicated. The patients were followed up for the period of hospital stay and four weeks post-surgery. All patients included in the study were evaluated by Indications, clinical presentations, type of surgery (open vs laparoscopic), tissue diagnosis and post-operative outcomes (01 month period)

Quantitative data is presented with the help of mean and standard deviation. Qualitative data is presented with the help of frequency and percentage table. Results were graphically represented when deemed necessary. Appropriate statistical tool was applied to study the different clinical parameters. Data analysis was done with Microsoft Excel 2016 and SPSS version 22. Graphical representation was done with the help of Microsoft Excel 2016.

3. Results

In our study, total patients who underwent elective splenectomy were 57 (N=57). Out of them, 37(65%) were female and 20(35%) were male. The ratio of male: female is 1:1.85. Mean age of study population was 26.28±16.46 years, ranging from 6 years to 74 years. (Figure 1)

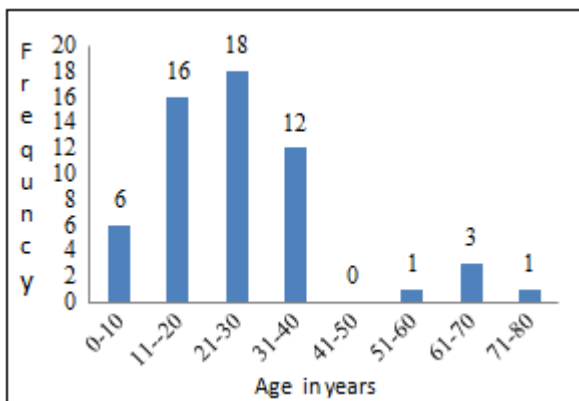


Figure 1: Demographic profile

In our study, the most common indication for elective splenectomy was Extra Hepatic portal vein thrombosis (EHPVO) accounting for 24.6% cases. Among the haematological conditions, the commonest indication was Idiopathic thrombocytopenic purpura (ITP) accounting for 19.3% cases. The only malignant indication was Non-Hodgkin's Lymphoma comprising of only one case. (Figure 2)

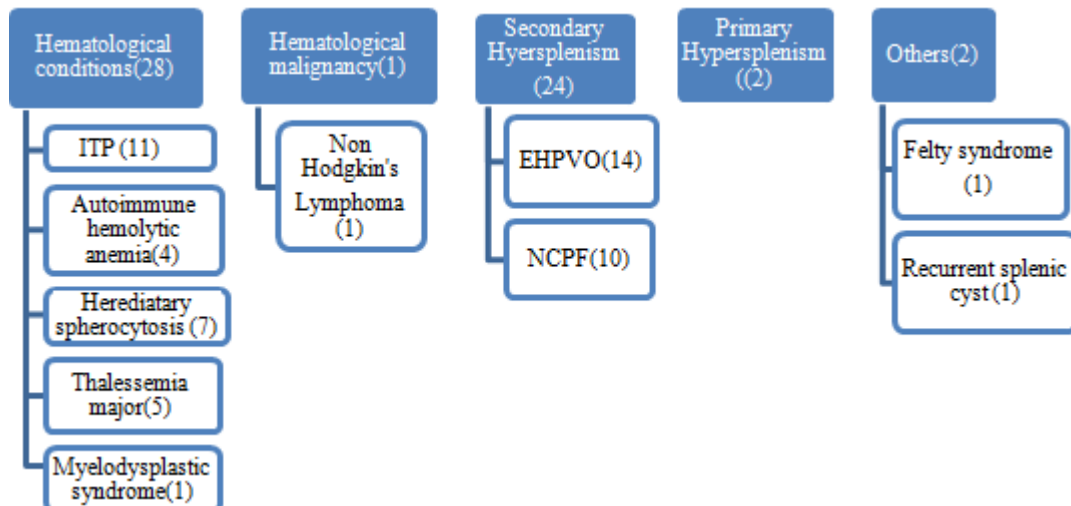


Figure 2: Distribution of indications

The chief presenting complaints were as shown in table. Many of the patients presented with more than one symptoms. (Figure 3)

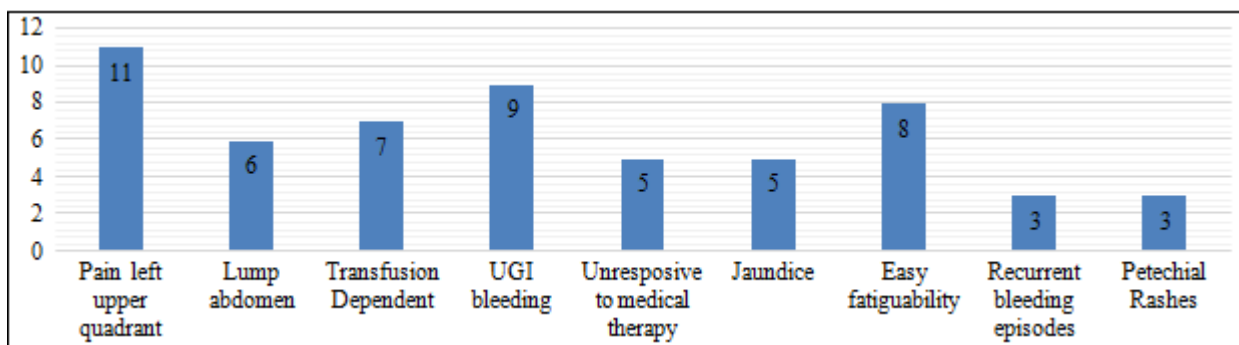


Figure 3: Distribution of clinical presentations

Open splenectomy was performed in 28 (49%) of the cases while 25 cases (44%) cases were performed laparoscopically. A total of 4 (7%) cases were converted from laparoscopic to open. Out of 4 conversions, 2 cases were converted due to intraoperative bleeding and other 2 cases were due to dense adhesions. (Figure 4)

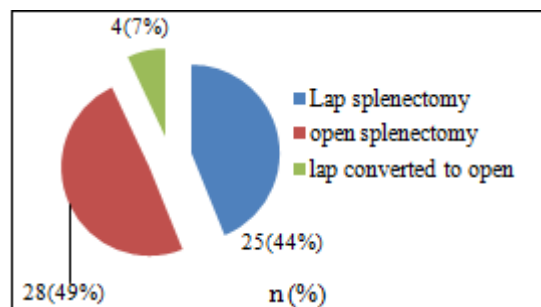


Figure 4: Distribution of indications

In 34(59.64%) cases, only splenectomy was performed while in 23 (40.36 %) cases splenectomy was combined with one or more additional procedures. The commonest procedure was lienorenal shunting in case of EHPVO (10) and NCPF (6). Most of the cases with additional procedures were open splenectomies. (Table 1)

Table 1: Distribution of additional procedures

Additional procedures Indications	Lienorenal shunt	Cholecystectomy	Drainage of walled off necrosis	Liver biopsy
EHPVO	10			1
NCPF	6			4
HS + Cholelithiasis		3		
HS + Acute pancreatitis (resolved)			1	
Haemolytic anaemia + Gall bladder sludge		1		
EHPVO+ Cholelithiasis		1		
Total(27)	16	5	1	5

The morbidity rate in our study was 24.56%(14 of 57 cases) as shown in table 2. Most of them were well known complications.

Table 2: Distribution of complications

Complications	Laparoscopic group	Op	Lap converted to open group
Lower respiratory infections	1	1	0
Pancreatic fistula	1	2	1
Wound infections	0	2	0
Left sub-diaphragmatic collection	0	1	0
Non specific infections requiring antibiotics	0	2	0
Intra operative injury to left pleura	1	0	0
Ascitis	1	0	0
Sub acute intestinal obstruction	0	1	0
Thrombocytosis	1	0	0
Total (14)	5	8	1

The length of hospital stay was considered as the day of surgery to the day of discharge of the patient. In our study, the overall length of hospital stay is 7.96 ± 3.7 days. In lap converted to open group, it is slightly more than both the other groups.

Table 3: Distribution of length of hospital stay

Overall	Laparoscopic group	Open group	Lap Converted to open group
7.96 days	6.68 days	8.92 days	9.25 days

Out of 57 cases, 55 final splenectomy specimens histopathological examination were reported as congestive splenomegaly consistent with different diagnosis.

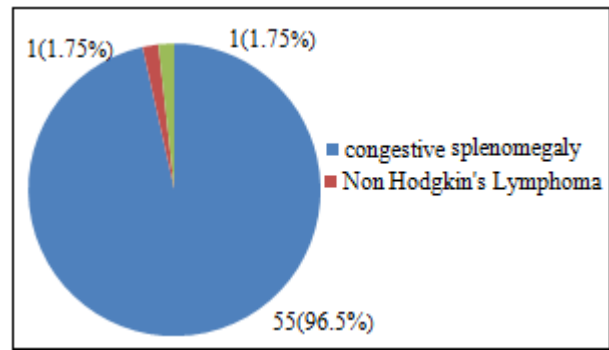


Figure 5: Distribution of histopathology examination

4. Discussion

The change in indications of elective splenectomy is seen over the course of the time. In the past, the elective splenectomies series suggested tremendous increase in splenectomy for staging laparotomy in Lymphoma that declined subsequently since 1970's. [5]

At present, the major indications of elective splenectomies are haematological conditions and hypersplenism- primary and secondary. Out of 57 elective splenectomies performed in our study, commonest indication was EHPVO. ITP was the most common haematological indication. Only malignant condition was Non-Hodgkin's lymphoma. A study from south India also showed ITP being the most common haematological indication followed by hypersplenism for elective splenectomy. In their study, malignant conditions were 3.7% which include NHL and Hodgkin's Lymphoma. [6] Similarly, a north Indian study is also consistent with our study which showed hypersplenism being the most common indication of elective splenectomy and EHPVO being the commonest among them. A case of lymphoma was the only malignant condition (1.64%) in their study.[7] The decrease in malignant indication is attributable to different newer less invasive diagnostic modalities available avoiding extensive staging surgery. In contrast a Turkish study from 2010 to 2017 showed malignancy being the most common indication for elective splenectomy (34.2%).[8] Jawad Ahmad et al in his 16 years study in northern Ireland had ITP as most common haematological disorder undergoing splenectomy.[9] A US based article reviewing 1715 cases of elective splenectomy from 2005 to 2011 found elective splenectomy performed for 78.4% for benign and 21.6% for malignant conditions. The most common benign and malignant conditions were ITP and lymphoma consisting 57.6% and 18.2 % respectively.[10] Demographic data varies in different studies. The present study had preponderance of female patients with 64.9% of cases. There are variations in this demographic indicator in different studies with male: female ratio >1[11], 1:1[12] and <1[6]. The differences in these figures may be attributable to the smaller sample size.

Though laparoscopic splenectomy is now considered gold standard for elective splenectomy. In our series, open approach outnumbered laparoscopic surgery (43.85% vs 49.15%). The requirement of additional procedures like shunt surgery and presence of massive splenomegaly justify the higher number of open surgeries in our study. In a 10

year north Indian study, open surgery largely out-numbered laparoscopic surgery (88.5%) due to various additional procedures[6] These open surgeries may further decrease in future with advancements in minimally invasive techniques. Moreover, some studies have already shown feasibility of laparoscopic approach even in massive splenomegaly. The conversion rate to open splenectomy in our series is 7.02% which is comparable with the literatures suggesting 5.2 to 10.3 %.[13,14]

In our series, the peri-operative morbidity rate was 24.56%. Different studies showed the rate ranging from 15% to 63%. [10,15]. Peri-operative complications in our series were mostly well known complications. Our study showed fewer complications rate with laparoscopic approach (35.71%) Vs (50%).All the patients in our series were vaccinated at least 02 weeks pre-operatively, no serious infections were encountered during our one month of follow up. But true incidence of OPSI could not be assessed during this short follow up period.

Following tables depicted comparison between different studies in different variables.

Table 4: Perioperative complications in various studies

Study	Peri-operative complications	% of patients
Mauricio Macedo et al [16](2010)	Conversion due to haemorrhage	6%
	Diaphragmatic injury	1.6%
	Pneumothorax	1.6%
	Portal vein thrombosis	1.6%
Babar Rehmani et al [6](2017 et al)	Conversion due to haemorrhage	3,27%
	Chest infection	1.63%
	Left sub-diaphragmatic collection	1.63%
	Thrombocytopenia with IVC thrombosis	1.63%
Present study	Conversion due to haemorrhage	3.50%
	Chest infection	3.50%
	Left sub-diaphragmatic collection	1.75%
	Pancreatic fistula	3.50%
	Thrombocytosis	1.75%

Table 5: Comparison between laparoscopic and open approach in different variables

Study	N	Approach	Length of hospital stay(days)	Peri-operative complications (%)
Adrian Park et al [17](1999)	147	Laparoscopic	2.4	10.2%
		Open	9.2	34.9%
Zhu J et al (2010) [18]	79	Laparoscopic	NA	13.6%
		Open	NA	41.2%
Present study	25	Laparoscopic	6.68	20 %
		Open	8.92	28.57%

The strength of this study is fairly adequate sample size within 5 years of time when compared to other studies of similar duration. The limitation of this study is its shorter follow up period. Though the study has been conducted in a tertiary centre hospital in western India, the study populations included patients from all over the country, hence the results can't be attributed to specific part of the country where the centre belongs.

5. Conclusion

The elective splenectomy is performed in varied clinical conditions, ranging from benign to malignant. The most common indications were EHPVO, NCPF and ITP. The study concluded with decreased incidence of malignant condition for elective splenectomy. Though laparoscopic splenectomy is emerging as a feasible and gold standard treatment for elective splenectomy but requirement of various additional procedures mostly shunt procedures make open surgery still a commonly preferred approach.

Conflicts of interest: The authors declare no conflicts of interest.

Disclosures and funding: None

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