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Indications And Outcomes Of Splenectomy: An Observational Study

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Abstract:
Background*: Splenectomy is done for various hematological disorders in which, the spleen exerts a destructive effect on blood cells, leading to anemia, thrombocytopenia, leukopenia or a combination of all these. Though previous studies reported details on the pattern of outcomes of splenectomy, the literature is still less. In this research, we report our experience with splenectomy for hematological disorders intending to determine the indications, complications and outcome of splenectomy.*
Objective: *This study was done to know the indications and outcomes of splenectomy done at a tertiary care centre.*
Materials and Methods*: This observational study was done in the Department of General Surgery at NRI Medical College, Mangalagiri, Andhra Pradesh, India from November 2021 to November 2023. 25 patients who underwent splenectomy were included as per the eligibility criteria. Indications and complications for splenectomy were assessed.*
Results*: Most of the patients were aged 41 to 50 years. Most of the patients were males. The most common indication was found to be splenomegaly. Pulmonary complication is the most common complication seen in the postoperative period. 19 patients did not require ICU management and were discharged within 10-15 days postoperatively. The remaining 6 cases including cases of polytrauma and patients with higher age groups needed postoperative ICU stay for about 10 days.12 patients underwent additional procedures. 7 of them underwent devascularization.*
Conclusion: *We suggest that patients should be vaccinated against encapsulated bacteria to reduce the infection rate. Laparoscopic splenectomy is a feasible option for selective cases, as it is associated with less pain during postoperative period.*
Key Words: *Splenectomy, Splenomegaly, Haematological disorders, Postoperative complications, Outcomes*

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I. Introduction

The spleen is a lymphoid organ with hematopoietic and immune functions. Splenectomy, the removal of spleen, is a common component of the management of various hematological disorders. Benign and malign hematological disorders constitute the major indication for elective open splenectomy.[1] It is a standard surgical treatment modality for patients with refractory, recurrent, or chronic diseases for which medical treatment fails. [2]

Splenectomy is done for various haematological disorders in which, the spleen exerts a destructive effect on blood cells, leading to anaemia, thrombocytopenia, leukopenia or a combination of all these.[3-4] Haematological disorders, especially sickle cell disorder (SCD) and thalassaemia, are common in India and certain parts of the Middle East.[5-8] Most of the patients with these disorders were referred for splenectomy by physicians, due to splenic dysfunction. The role of splenectomy in certain haematological disorders is well known.

Splenectomy is successful in reversing conditions causing hypersplenism like in patients of myeloproliferative disorders. ITP (idiopathic thrombocytopenic purpura) is also one of the common hematologic indications for splenectomy. Studies have reported that 60–90% of success rates for ITP with splenectomy.[9-10] Presence of an accessory spleen should also be considered among patients scheduled for splenectomy for hematologic reasons. The morbidity and mortality were reported to be ranging from 8 to 52% and 1.7% for

splenectomy as per the previous studies. [11-14] Though previous studies reported details on the pattern of outcomes of splenectomy, the literature is still less.[15-16] In this research, we report our experience with splenectomy for haematological disorders intending to determine the indications, complications and outcome of splenectomy.
Objective: This study was done to know the indications and outcomes of splenectomy done at a tertiary care centre.

II. Methods

The current study was done at a tertiary care centre in India from January 2022 to January 2024.
Study Design: Observational study.
The study is observational, as no therapy was given to patients as a part of the study.

Study Location: This study was done at a tertiary care teaching hospital in the department of General Surgery at NRI Medical College, Andhra Pradesh, India.

Study Duration: 2 years: November 2021 to November 2023

Sample size: 25.

Sampling procedure: convenience sampling

Sample size calculation:

The most common splenic disorder is splenomegaly. The most common indication for splenectomy is also splenomegaly. The prevalence of splenomegaly was 2% as per previous research.[17]
The sample size is calculated as follows:
$N=Z^2PQ/E^2$
Error=5%, Z- Confidence intervals=90%
N=22
22 is the minimum sample size, hence we included 25 patients in our research.

Subjects & selection method: The study population was drawn from patients who were scheduled for splenectomy at our tertiary care center.

Inclusion criteria:
1. All the patients who underwent splenectomy in our hospital
2. Either sex

Exclusion criteria:
1. Patients who haven't given consent for study
2. Pregnant and lactating women
3. Patients who won't fit for general anesthesia.

Methodology:

After Involving patients as per the inclusion and exclusion criteria, data collection was done. A detailed history was taken from each patient. Thorough physical examination, vital signs and systemic examination were done. The data was subjected to statistical analysis and then a conclusion was drawn.

Parameters assessed:
- Age
- Gender
- Indications for splenectomy
- Outcomes including:

Intraoperative blood loss
Postoperative pulmonary complications
Thrombotic complications
- Types of splenectomies
- Vaccinations
- ICU stay

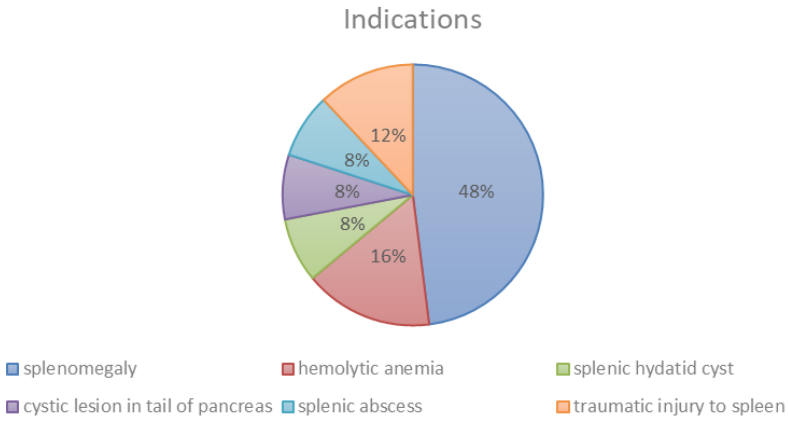
Definitions: Spleen measures up to 12 cm in craniocaudal length. 12 cm to 20 cm denotes splenomegaly and a length more than 20 cm indicates massive splenomegaly. Spleen weighing more than 1000 grams is also considered splenomegaly.
Splenic abscess – is diagnosed when there is a triad of fever, left upper quadrant tenderness and leukocytosis. Biochemical leak is referred to when the drain fluid amylase levels are 3 times higher than the serum amylase levels on or after Post operative day 3.
Ethical considerations: Written Informed consent was obtained from every patient who participated in the study.
Statistical analysis- Data was analyzed using Microsoft Excel 2021. They were expressed as frequencies and percentages.

III. Results

The current study included 25 patients for whom splenectomy was done.
Age: Most of the patients belonged to the age group 41 to 50 years (40%). The age of the patients ranged from 8 yrs. to 70 years with mean age of 46.8 yrs.
Gender: 14 patients were males, and 11 patients were females.
Clinical features: Most common presentation is mass per abdomen (80%) followed by dull aching type of pain in left side of the abdomen (20%).

Indications for splenectomy:

Splenomegaly is the most common indication-48% of patients- Portal venous thrombosis with bleeding varices was seen in 5 patients (20%). Non-Cirrhotic Portal Fibrosis with Portal Hypertension was seen in 2 patients. Hemolytic anemia is the next most common cause- 16% of patients. Trauma was the reason in 12% of patients.



Graph 1: Indications of Splenectomy

Outcomes:

Postoperative pulmonary complications were seen in 5 patients, Biochemical leak in pancreatic tail was seen in 2 patients, thrombotic complications were seen in 1 patient and surgical site infection was seen in 3 patients.

Outcomes /Complications	No. of patients
1. Postoperative pulmonary complications	5 (20%)
2. Biochemical leak in tail of the pancreas	2(8%)
3. Thrombotic complications	1(4%)
4. post-operative surgical site infections	3(12%)

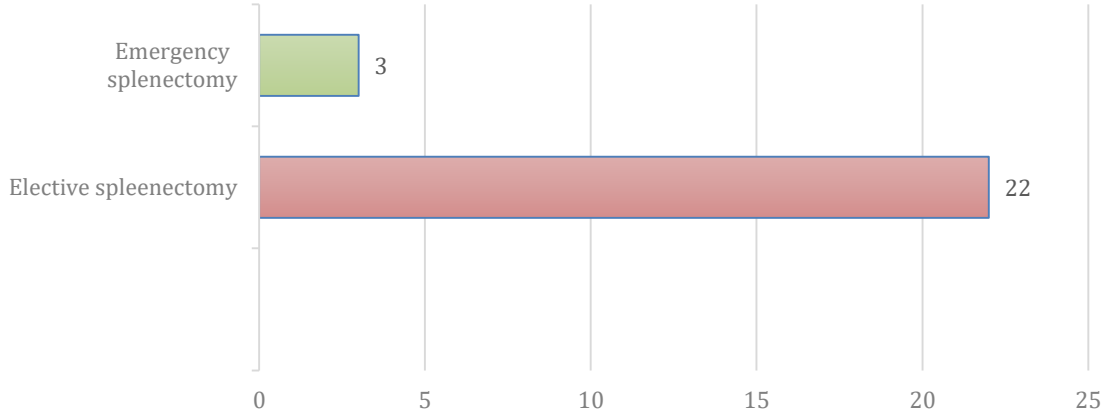
Table 1: Outcomes of splenectomy

Post op. lung complications: Lower lobe atelectasis of lungs - 2 cases (8%). Pleural effusion – was seen in 1 case (4%) of polytrauma and was managed by guided tap of pleural effusion.

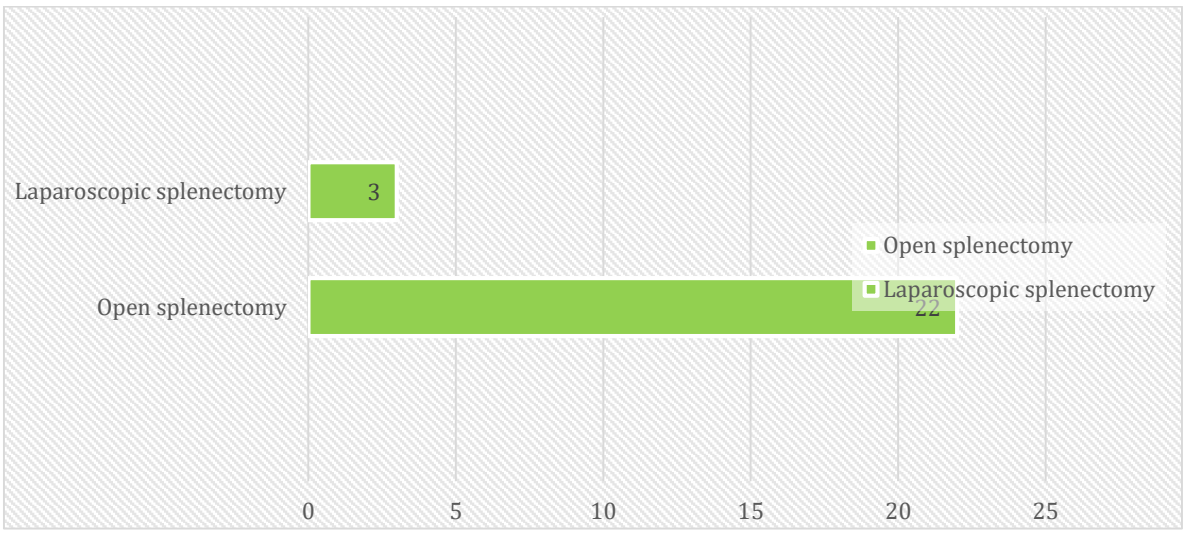
Lung Complications	**No. of patients**
1.Lower lobe atelectasis	2 (8%)
2. Pneumonia with ARDS	1(4%)
3. Pleural effusion	2(8%)
4. No lung complications	20(80%)

Table 2: Lower lobe lung complications

Types of splenectomies done: Splenectomy was done by open approach in 22 patients. Laparoscopic approach was done in splenic abscess and splenomegaly patients. Elective splenectomy was done in 22 cases and 3 cases were done under emergency. Emergency splenectomy was done in a case of splenic abscess and 2 cases of polytrauma.



Graph1: Type of splenectomy



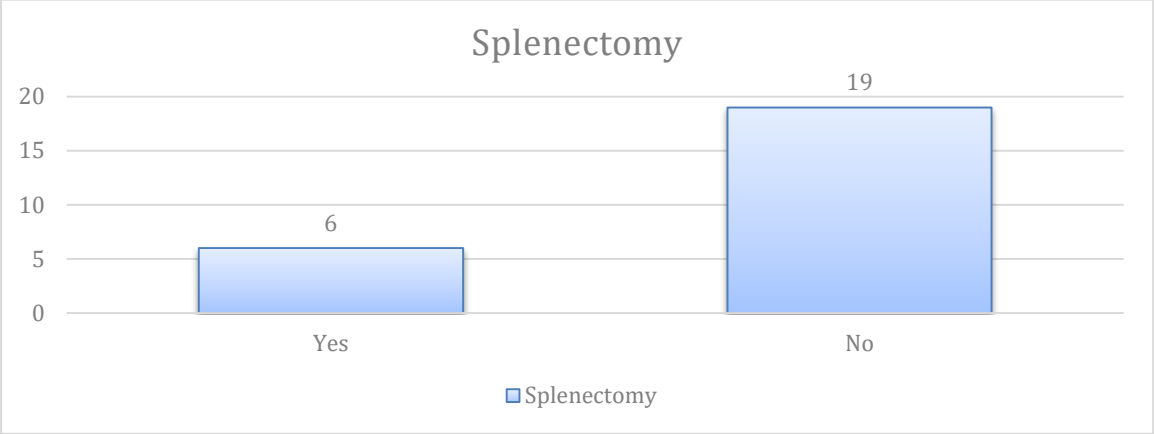
Graph 2: Type of splenectomy

Vaccination:

Vaccinations are given for elective cases pre-operatively as per schedule and for emergency cases they were given postoperatively after 2 weeks on postoperative day 14th.

ICU Stay:

In our study of 25 patients 19 patients do not require ICU management and were discharged within 10-15 days postoperatively. In the remaining 6 cases including cases of polytrauma and patients with higher age group needed postoperative ICU stay for about 10 days.



Graph 3: ICU stay among patients.

Intraop. Blood loss: The average blood loss was 250-300 ml with emergency cases having higher volume loss up to 950 ml.

Additional procedures done:

12 patients underwent additional procedures. 7 among them underwent devascularization.

Additional procedures	Number	Underlying disease
1. Devascularisation	7	Portal hypertension with bleeding varices
2.Distal pancreatectomy	2	Cystic lesion in tail of pancreas
3.Splenorenal shunt	2	Portal hypertention with pre hepatic portal vein thrombosis with esophageal varices
4.Pancreaticojejunostomy	1	Mucinous cystadenoma of pancreas

Table 3: Additional procedures done.

IV. Discussion

The current study included 25 patients who underwent a splenectomy at our tertiary care center over 2 years. The most common indication was found to be splenomegaly. Pulmonary complication is the most common complication seen in postoperative period. 19 patients do not require ICU management and were discharged within 10-15 days postoperatively. In the remaining 6 cases including cases of polytrauma and patients with higher age group needed postoperative ICU stay for about 10 days.12 patients underwent additional procedures. 7 among them underwent devascularization.

Davies et al.[18] did a study on splenectomy. Among 105 splenectomy patients, 58 were males. Male preponderance was similar to the current study. The median age was 54 years and it ranged from 10–87 years. 37 patients underwent emergency splenectomy. Elective splenectomy was performed commonly compared to emergency splenectomy similar to the current study.

Machado et al.[19] did a retrospective analysis on 150 patients who underwent splenectomy. The most common indication for splenectomy was found to be sickle cell disease followed by beta thalassemia, thrombocytopenic purpura. 2/3rd of patients had a good response to splenectomy.

Ciftciler et al.[20] did a study on 102 patients. The median age was 52 years. 70% of patients underwent splenectomy for their haematological disease, in contrast to the current study findings.

Patel et al.[21] reported the effect of splenectomy among patients with purpura who are resistant to medical treatment. 91% of the patients had complete response after splenectomy.. Few more studies proved that splenectomy is a potent surgical modality for symptomatic patients with splenic lymphoma.[22-23]

One study showed that there is significant continuous fall in annual blood transfusion need and increase platelet counts occurred after-splenectomy in thalassemia patients.[24]

Infection is a common complication of splenectomy. In our study, no patient had infection. Bisharat et al. Showed the incidence of infection after splenectomy as 3.2%.[25]

Limitations:

Small sample size

Mortality rate and re admission rate was not assessed, as patients were followed up only for 2 weeks after discharge.

V. Conclusion

In our study, the major indication of splenectomy was found to be Splenomegaly. We suggest that patients should be vaccinated against encapsulated bacteria to reduce the infection rate. Laparoscopic splenectomy is a feasible option for selective cases, as it is associated with less postoperative pain. The study is self-sponsored. There were no conflicts of interest.

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