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**Dr. SP Rajan**
Associate Professor, Department of General Surgery, PKDAS Institute of Medical Sciences, Kerala, India

**Dr. Sudheer UK**
Assistant Professor, Department of General Surgery, PKDAS Institute of Medical Sciences, Kerala, India

**Dr. Sreejith**
Assistant Professor, Department of General Surgery, PKDAS Institute of Medical Sciences, Kerala, India

**Dr. Dinesh Babu MV**
Associate Professor, Department of General Surgery, PKDAS Institute of Medical Sciences, Kerala, India

**Corresponding Author:**
**Dr. Sudheer UK**
Assistant Professor, Department of General Surgery, PKDAS Institute of Medical Sciences, Kerala, India

# Indications for splenectomy in a tertiary care hospital

**Dr. SP Rajan, Dr. Sudheer UK, Dr. Sreejith and Dr. Dinesh Babu MV**

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**Abstract**
**Introduction:** The spleen plays an important role in immune-surveillance and haematopoiesis. Its role in the fight against infection, especially infection of encapsulated organisms, is particularly significant. It also removes intracellular inclusions (pitting) and filters aged blood cellular elements from circulation.
**Aim:** This study aims at the indications for elective splenectomy and the outcomes at a tertiary care centre.
**Materials and Methods:** We conducted a Prospective observational study done for 3 years. Total 42 patients who underwent splenectomy, both emergency and elective were included for data collection. Inclusion criteria for the study were all the patients undergoing splenectomy. The spleen was approached via an upper midline or left subcostal incision.
**Results:** In 42 patients with splenectomy M=mean age of the patients was 37.9 ±15.42 years, of which 23(54.8%) are males and 19(45.2%) were females. A majority of the patients were in the age group of 18-45 years. Most common indication was haematological in 42 patients, of which 20 (47.6%). traumatic Idiopathic Thrombocytopenic Purpura (ITP) cause have 8 patients (19%).Most of the patients 3 (60%) patients have complications after trauma.
**Conclusions:** Most cases of splenectomy in our centre caused by trauma, and among the different types of trauma, blunt trauma is the dominant cause. splenectomy must be undertaken only after anticipating both, short- and long-term risks and potential benefits to the patient.

**Keywords:** Indications, splenectomy, tertiary care hospital

## Introduction
Splenectomy is a surgical treatment for a wide range of diseases including symptomatic splenomegaly, autoimmune, malignant, hereditary and congenital disorders, splenic injury/rupture secondary to blunt trauma to abdomen. By far the two most common atraumatic indications for splenectomy are malignancy and haematological autoimmune disorders, such as Idiopathic Thrombocytopenic Purpura (ITP) and Autoimmune Haemolytic Anaemia (AIHA).
The conservative management of splenic injuries has evolved over the past few decades with the realisation of the importance of the spleen in immunological defence against encapsulated organisms and a better understanding of the role of non-operative management of splenic injuries [1]. Non-operative management in adults have achieved success rates ranging from 68 to 83% and is considered to be the cornerstone of treatment in hemodynamically stable patients.[2] Non-operative management represents the progression of 'save our spleen' concept which was initially used for children and later on extended to adults. The only absolute indication for emergency laparotomy is hemodynamic instability [3].
Spleen is the meeting ground of medicine and surgery and most patients for elective splenectomy are primarily evaluated by physicians and then referred to the surgeons. Both physicians and surgeons need to be aware of the utility of splenectomy as a therapeutic option in various medical conditions. Hence the reappraisal of the indications for splenectomy, the effect of splenectomy on the disease process and the safety and complications of the operations itself need to be evaluated time and again so that the procedure can be confidently advised in the set of patients who are most likely to be benefitted by the operation. This study looks at the indications for elective splenectomy and the outcomes at a tertiary care centre.

## Materials and Methods
We conducted a Prospective observational study in our hospital, including patients from October 2017 to October 2020. Total 42 patients who underwent splenectomy, both emergency and elective were included for data collection.

Inclusion criteria for the study were all the patients undergoing splenectomy. Brief history and demographic details, such as age, gender, comorbidities, duration of disease condition, indications of splenectomy were collected.

The spleen was approached via an upper midline or left subcostal incision. Patients requiring an elective splenectomy were given a vaccine prophylaxis against pneumococcal infection at least two weeks prior to their operation. Those who needed an emergency splenectomy for trauma were given a prophylaxis as soon as possible during the postoperative period. Postoperatively, patients were usually given amoxicillin 250 mg twice daily, as an antibiotic prophylaxis against postsplenectomy sepsis for at least the following two years after the procedure surgery.

All hemodynamically unstable patients were immediately taken to the operating room following an FAST Scan to undergo an emergency laparotomy, while those who were stable were evaluated by CT) scan of the abdomen and pelvis and x-ray chest and abdomen.

In those patients who were hemodynamically stable, splenic injuries were Graded I to V according to the American Association for the Surgery of Trauma (AAST) organ injury scale based on the findings of the CT. Those patients who were taken up for immediate laparotomy were graded according to operative findings. Patients who were managed conservatively were kept on Intravenous Fluids on strict bed rest. Enteral nutrition was restricted and vital signs (Pulse Rate, Respiratory Rate, Blood Pressure) were monitored. Serial abdominal examinations and Monitoring of Haemoglobin concentration were done daily. Follow up scans were done after one week and after one month after injury. Outcomes were compared according to Morbidity and Mortality, Postoperative complications, requirement of mechanical ventilation and Length of hospital stay.

All statistical analyses were performed using SPSS V 16. Descriptive statistics such as frequencies, percentages, median and standard deviation was used to describe the demographic, clinical details and the indications. Institutional Ethical Clearance was obtained prior to starting the study.

## Results

**Table 1:** Age distribution of patients undergoing splenectomy

| Age Group in years | Number of cases | Percentages |
|---|---|---|
| 18-45 | 25 | 59.6 |
| 46-50 | 13 | 30.9 |
| >50 | 4 | 9.5 |
| Total | 42 | 100 |

Mean age of the patients was 37.9 ±15.42 years, of which 23(54.8%) are males and 19(45.2%) were females. A majority of the patients were in the age group of 18-45 years.

**Table 2:** Various indications for elective splenectomy

| Indications | Number of cases | Percentages |
|---|---|---|
| Idiopathic thrombocytopenic purpura) | 8 | 19 |
| Haemolytic anaemia | 5 | 11.9 |
| Lymphoma | 2 | 4.7 |
| Myelofibrosis | 3 | 7.1 |
| Hereditary spherocytosis | 4 | 9.5 |
| Traumatic cause | 20 | 47.6 |
| Total | 42 | 100 |

Most common indication was haematological in 42 patients, of which 20 (47.6%). traumatic Idiopathic Thrombocytopenic Purpura (ITP) cause have 8 patients (19%).

**Table 3:** Mortalities after Splenectomy and Their Causes

| Complication | Number of patients | Percentages |
|---|---|---|
| Trauma | 3 | 60 |
| Pulmonary embolism | 1 | 20 |
| multiple trauma | 1 | 20 |
| Intracranial haemorrhage | 1 | 20 |
| Elective | 2 | 40 |
| Intracranial haemorrhage | 1 | 20 |
| Subarachnoid haemorrhage | 1 | 20 |

Most of the patients 3 (60%) patients have complications after trauma

All patients received pre-operative polyvalent pneumococcus, Haemophilus influenza B and Meningococcus vaccinations. Post-operatively, all patients were on lifelong antibiotic prophylaxis with oral antibiotics

## Discussion

The management of splenic injuries has evolved considerably lately, so the classic explorative laparotomy and splenectomy, when needed, has given its place to interventional, nonoperative therapy. However, nonoperative treatment in general fails to manage the rupture in up to 40% of all cases [4].

In present study have mean age of the patients was 37.9 ±15.42 years, of which 23(54.8%) are males and 19(45.2%) were females. A majority of the patients were in the age group of 18-45 years. Unfavourable results of nonoperative treatment are mainly found in older patients (> 55 years), in patients with severe splenic trauma. Ehimwenma and Tagbo [5] reported 91 male individuals mean age 32 years) and in 109 female individuals mean age 29 years). Our results are very similar to those in literature mentioned above.

In our study, most common indication was haematological in 42 patients, of which 20 (47.6%). traumatic Akinkuolie *et al.* [10] described 40% incidence of motor accidents Meshikhes *et al.* [11] pointed to trauma with 20.8% of indications for splenectomy in Saudi Arabia.

Glass JM *et al.* [12] study, among 28 patients who underwent splenectomy in a district hospital, trauma was the indication in only four patients. The remaining 24 patients either had haematological indications or had their spleen removed as part of other abdominal surgery.

In our study, Idiopathic Thrombocytopenic Purpura (ITP) cause have 8 patients (19%). In a study conducted by Winslow *et al.* [13] this rate was 32%. There were 3 cases that underwent a splenectomy due to ITP in our study, three of whom survived, while two did not. One patient died of an intracranial haemorrhage, and another one due to a subarachnoid haemorrhage. whereas this indication involved 23% of splenectomies in the Meshikhes *et al.* [11] study. Most of the non-

emergency cases in our city have the tendency to undergo the elective operations such as splenectomy in the better equipped centers, and most of them probably refer to such centers.

Another splenectomy-associated postoperative complication is the overwhelming postsplenectomy infection (OPSI). OPSI is suspected when a patient after splenectomy presents with sudden systemic infection, occasionally dermatorrhagia and DIC, whereas no obvious site of the infection is present [14]. Although the pathogenesis of OPSI remains unclear, it has a fast, overwhelming onset. It starts as a simple respiratory infection, but it rapidly progresses to hyperpyrexia, headache, shivering, jaundice, anuria, septic shock, acute respiratory distress syndrome (ARDS), multiple organ dysfunction syndrome (MODS), coma, and death. The primary pathogenic bacteria of OPSI are S. pneumoniae, N. meningitides, and H. influenza. In a prospective study by Theilacker *et al*. [15] it was shown that S. pneumonia was the most important cause for severe sepsis development. They also showed that due to proper vaccination of patients after splenectomy, incidence of OPSI has been substantially reduced compared to the past. Although laparoscopic splenectomy is clearly superior to standard laparotomy in terms of postoperative infections, incidence of OPSI remains similar because this complication is related more to spleen removal than to the surgical approach [16].

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