



CODEN [USA]: IAJPBB

ISSN : 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4412130>
Available online at: <http://www.iajps.com>

Research Article

### EVALUATION OF MULTIPLE PRIMARY POSTOPERATIVE COMPLICATIONS OF SPLENECTOMY IN PATIENTS PRESENTING TO TERTIARY CARE HOSPITAL

Dr. Ali Zaib Adil<sup>1</sup>, Dr. Syed Muhammad Waqar Haider Bukhari<sup>2</sup>, Dr. Muhammad Ibrar Khan<sup>3</sup>

<sup>1</sup> District Headquarters hospital Rawalpindi, <sup>2</sup> CMO at RHC Khurshidabad District Haveli AJK, <sup>3</sup> Hospital Provincial Dr. Gustavo Aldereguia Lima de Cienfuegos.

**Article Received:** November 2020    **Accepted:** December 2020    **Published:** January 2021

**Abstract:**

*Objective:* To evaluate the percentage of various early postoperative complications.

*Material and method:* This is descriptive type of study with a purposive, non-probability sampling technique. We included all patients who underwent open splenectomy due to injury or other medical conditions.

*Place and Duration:* Study was conducted in the Surgical department of District Headquarters hospital Rawalpindi for one-year duration from 1<sup>st</sup> June 2019 to 30<sup>th</sup> May 2020.

*Results:* A total of 30 patients were enrolled in the study. we examined 30 patients. Of these 30 patients, 18 were admitted to the emergency department after an injury, and the remaining 12 patients were elective for medical conditions. Among these patients, the greatest number of patients undergoing splenectomy was in the age group of 21-30 years, and then in the group of 31-40 years. There were 20 men (67%) and 10 women (33%).

**Key words:** Splenectomy, Complications, Postoperative

**Corresponding author:**

**Dr. Ali Zaib Adil,**

District Headquarters hospital Rawalpindi.

QR code



Please cite this article in press Ali Zaib Adil et al, Evaluation Of Multiple Primary Postoperative Complications Of Splenectomy In Patients Presenting To Tertiary Care Hospital., Indo Am. J. P. Sci, 2021; 08(1).

**INTRODUCTION:**

The spleen, which comprises 50% of the body's lymphoid tissue, has both hematological and immune functions. It is a mobile organ occupying the upper left quadrant and one of the most frequently injured organs in road accidents. In the civilian community, blunt abdominal trauma is the most common cause compared to penetrating trauma. The most common cause of splenectomy is damage to the spleen. Other, less common indications for splenectomy are a hydrated cyst, rupture of the diseased spleen, splenic vein thrombosis, blood dyscrasia, and myeloproliferative disorders. Except in the case of trauma, all of the other conditions mentioned above require proper preparation and planning prior to splenectomy. There are many complications of splenectomy and they are associated with high mortality, especially in emergency situations where patients are not properly prepared and vaccinated, especially against pneumococci. Well-documented complications include left basilar atelectasis, hemorrhage, sub-breast abscess, pancreatic tail damage, thrombocytosis, gastric fistula, and faecal fistula due to colon damage. The aim of our study is to evaluate the percentage of various early postoperative complications.

**MATERIAL AND METHOD:**

This is descriptive type of study with a purposive, non-probability sampling technique. This study was conducted the Surgical Unit-II of District Headquarters hospital Rawalpindi for one-year duration from 1<sup>st</sup> June 2019 to 30<sup>th</sup> May 2020. We included all patients who underwent open splenectomy due to injury or other medical conditions. From 1<sup>st</sup> June 2019 to 30<sup>th</sup> May 2020, we examined 30 patients. Of these 30 patients, 18 were admitted to the emergency department after an injury and the remaining 12 patients were elective for medical conditions. A pre-prepared Proforma was produced for all identified patients' information,

including biological data and pre-operative and post-operative results. A detailed history and clinical examination were recorded for 18 emergency patients. All patients underwent preoperative tests (CBC, CUE, clustering and cross-matching), biochemical (S / E, RPM, RBS, LFT) and radiological tests (X-ray of the chest, ultrasound of the abdominal cavity). ECG of patients over 45 years of age was performed. After the final diagnosis, the patients were operated on urgently. All of these patients were given GA. An exploratory laparotomy was performed by incising the upper midline. After rinsing the peritoneum with 3-4 liters of normal saline, 2 intraperitoneal drains were placed, one in the diaphragmatic space and the other in the pelvis. In the immediate postoperative period, patients were administered intravenous cephalosporins of the third generation, strict water and electrolyte balance and adequate analgesia. The drains were removed on the 2<sup>nd</sup> or 3<sup>rd</sup> day. On the fourth or fifth day, patients were allowed to eat a liquid diet. Vaccination against pneumococci and Hemophilus influenza was performed before the patients were discharged home. The remaining 12 patients out of 30 who were transferred from various medical and oncology departments who had already been diagnosed and were transferred to our department for spleen removal. Before the surgery, vaccinations against pneumococci and hemophilia flu were performed on the operating floor, and splenectomy was performed on a scheduled basis. All information on postoperative complications was recorded and appropriately managed.

**RESULTS:**

A total of 30 patients were enrolled in this study. Among these patients, the greatest number of patients undergoing splenectomy was in the age group of 21-30 years, and then in the group of 31-40 years. There were 20 men (67%) and 10 women (33%) as shown in Table 1.

Table 1: Age / sex distribution of patients

Age in years	=n	Male	Female
1-10	4	4	-
11-20	2	2	-
21-30	7	7	-
31-40	6	2	4
41-50	6	1	5
51-60	5	4	1

Twenty patients (67%) were from urban areas and 10 patients (33%) were from rural areas (Table 2).

Table 2: Urban/rural distribution

Urban	rural
66.7	33.3

Table 3: Indications of splenectomy: trauma / medical conditions

Indications	%age
Splenic trauma	60
Hodgkin's Lymphoma	10
Thalassemia	7
Idiopathic Thrombocytopenic purpura	10
Hyadated cyst	10
Hemolytic anemia	3

Table 4: Complications after splenectomy

Complications	=n
Basal atelectasis	4
Hwmorrhage	4
Subphrenic abscess	3
Damage to pancreatic tail	2
Thrombocytosis	3

Table 5: Splenectomy in traumatic patients

Indications	=n	%age
Splenic trauma alone	6	33
Splenic trauma associated with gut and liver injuries	12	67

Table 6: Complications after splenectomy

Complications	Traumatic patients	Splenectomy with other medical condition
Thrombocytosis	1	2
Haemorrhage	3	1
Left basal atelectasis	3	1
Pancreatic Injury	2	-
Thrombocytosis	-	3

Table 7: Reasons for splenectomy

Reasons	Total	Pt. with complications	Complications
Medical conditions	12	5(16.67%)	7(43.75%)
Trauma	18	7(23.33%)	9(56.25%)

Eighteen patients (60%) had spleen trauma and 12 (40%) had other conditions (Table 7). Abdominal pain was the most common symptom. It occurred in 20 cases (66.7%), followed by shock in 15 cases (50%), 1 case (3.3%) had fever, and 3 cases (10%) had anemia. Tenderness was present in 18 cases (60%), positive Kehr sign in 12 cases (40%), and splenomegaly in 3 cases (10%). Lymph nodes were palpable only in 2 cases (7%). The studies performed for spleen injury included a complete blood test in 18 cases (100%), an ultrasound in 18 (100%), and a chest X-ray in all 18 (100%). Tests carried out in other diseases included a complete blood test in 12

cases (100%), ultrasound in 12 cases (100%), computed tomography in 5 cases (41.7%) and angiography in 2 cases (16.7%). The study included patients who underwent splenectomy due to trauma or other medical reasons. A total of 16 (53%) complications were reported in 12 patients (40%). Of these 12 patients, 5 (17%) were operated on due to medical conditions and 7 (23%) patients were operated on due to trauma (Table 7). Of the 18 splenectomy cases due to trauma, twelve had other abdominal injuries, such as the liver and intestines, and six had only spleen injury (Table 5). Subphrenic abscess occurred in 3 cases (19%) and, according to

the 95% confidence interval, this percentage ranged from 0.00% to 15.60% in all patients (Table 8).

Table 8: Proportion of complications in total patients

Complications	%age	95% CI for %age for all pts.
Basal atelectasis	133.33	(01.17%, 25.50%)
Thrombocytosis	10.00	(0.00%, 20.74%)
Injury to tail of pancreas	06.67	(0.00%, 15.60%)
Subphrenic abscess	10.00	(0.00%, 20.74%)
Hemorrhage	13.33	(01.17%, 25.50%)

It accounts for 19% of all complications (Table 9). Of these, in one case, splenectomy was performed due to the injury, and in two, splenectomy was performed for Hodgkin's lymphoma and idiopathic thrombocytopenic purpura. The case of a traumatic spleen was associated with intestinal damage (Table 6). Haemorrhage occurred in 4 cases (13.3%) and, as estimated by the 95% confidence interval, this percentage ranged from 1.17% to 25.50% in all patients (Table 8). It accounts for 25% of all 16 complications (Table 9). Of these four patients, three were operated on for an injury and one for an echinococcal cyst (Table 6). Two cases were treated

conservatively by blood transfusion and two cases were re-examined. Significant left basilar atelectasis occurred in 5 cases (13.3%) and, according to the 95% confidence interval, this percentage ranged from 1.17% to 25.50% for all complications (Table 9). One patient underwent splenectomy due to an injury (Table 6). All patients responded well to physical therapy. Pancreatic tail injury occurred in 2 cases (6.7%) in this study and, as estimated by the 95% confidence interval, this proportion ranged from 0.00% to 15.60% for all patients (Table 8). It accounts for 13% of all 16 complications (Table 9).

Table 9: Complication percentages in total complication

Complications	%age
Haemorrhage	24
Basal atelectasis	25
Subphrenic abscess	19
Thrombocytosis	19

These patients were operated on due to an injury (Table 6). They were managed conservatively. Thrombocytosis occurred in 3 cases (10%) and, as estimated by the 95% confidence interval, this proportion ranged from 0.00% to 20.74% for all patients (Table 8). It accounts for 19% of all 16 complications (Table 9). In all cases, splenectomy was performed due to idiopathic thrombocytopenic purpura (Table 6). In two cases the platelet count was below 100,000 /  $\mu$ L and in one case it was over 1 million /  $\mu$ L. All patients underwent deep vein thrombosis prophylaxis. Fortunately, there was no embolism. Long-term aspirin therapy was administered to one patient at discharge whose platelet count exceeded one million /  $\mu$ L. This case was operated on for idiopathic thrombocytopenic purpura. In this study, death occurred in 2 cases (6.7%). One patient was operated on for Hodgkin's disease, and one patient was operated on for trauma. This patient also had liver and colon damage. This patient died from complications not directly related to the splenectomy. In the previous case, the cause was a

subphrenic abscess. Proportion of patients with complications = 40% According to an estimate of the 95% range, this proportion will range from 22.45% to 57.53% for all patients.

### DISCUSSION:

The overall rate of complications after splenectomy is difficult to quantify as it varies with different spleen diseases. Defective immune mechanism may be a significant factor in the development of early complications in patients after splenectomy. In the present study, 5 out of 12 patients (41.7%) who underwent splenectomy for disease experienced complications. In a study by Petrovic M, Popovic M, Knezevic S, Matic S, Gotic M, Milovanovic A et al, the rate of postoperative complications was higher for medical diseases. This is comparable to the current study. Another study was conducted by Khan AFA, Gondal KM, Ali AA, the complication rate was 30% in 28 patients who underwent splenectomy for various diseases. This is less compared to the current study. This may be due to the fewer cases and good

postoperative care in this study. In this study, 12 patients (40%) experienced complications. In a study by Juvar I, Dragomirescu C, Priscu A, 68 out of 200 patients (34%) had complications. In another study, the complication rate was 27%, so the complication rate in this study is slightly higher than in the two studies. This slight difference may be due to the lower number of cases in this study and the fact that, in the emergency mode, 18 out of 30 splenectomies (60%) were performed by relatively inexperienced surgeons. In the presented study, basal atelectasis occurred in 4 cases (11.3%). In the study, 19 out of 200 cases (9.5%) experienced pulmonary complications. Consequently, the rate of basal atelectasis is higher in the present study, which can be attributed to the relatively poor nursing care in our system. In another study by Majid A, Zahra F, Waheed M, Manan J, the incidence of respiratory infections was an issue in 9 of 14 patients (64%). It is higher compared to the current study. This may be because of a smaller number of cases, and the study was only done in one disease. In the presented study, thrombocytosis occurred in 3 cases (10%). In another study, 20 out of 200 cases (10%) suffered from thrombocytosis. This is comparable to the current study. Another study by Canonico S, Sciaudone G, Santoriello A, Campitiello F, Ciarleglio FA, Lovine F et al, showed a correlation between persistent thrombocytosis after splenectomy as a causative agent of thrombocytosis. This study indicates that splenectomy contributes to abnormal platelet aggregation and activation of hypercoagulable endothelial cells. There is an increased number of thrombocytes after splenectomy, which can lead to thromboembolic complications in the postoperative period. A prolonged anti-aggregation therapy is suggested. In the presented study, damage to the pancreatic tail occurred in 2 cases (6.7%). In the study, this complication occurred in 5 out of 200 cases (2.5%). Thus, this complication in the present study is greater. This may be due to splenectomy performed by relatively inexperienced surgeons in an emergency. In this study, a subcutaneous abscess developed in 3 out of 30 cases (10%). In the study, septic complications occurred in 20 out of 200 cases (11%). Therefore, the percentage of septic complications is almost similar in the above study. In another study by Shantney CH, septic complications were also one of the common complications after splenectomy. It is worth noting that the rate of septic complications after splenectomy is higher when accompanied by intestinal injuries. In this study, haemorrhage occurred in 4 cases (13.3%). In all these cases, a splenectomy was performed due to the medical conditions. In these cases, the spleen was significantly enlarged. In 2 cases, the haemorrhage

was mild and conservatively treated by blood transfusion. Whereas in the other two cases studies were performed to control significant bleeding. Bleeding occurred from the raw surface of the diaphragm as a result of the formation of adhesions between the massive spleen and the surroundings. One of these two patients died. Therefore, massive enlargement of the spleen increased the risk of postoperative complications. The same conclusions were reached by a study by Arnoltti JP, Karam j, and Brodsky J in Philadelphia, USA. In another study, it was 7.1%. In this study, 2 of 30 cases (6.7%) died. A study by MacRae MH, Yakimets WW, Reynolds T, the mortality rate was 5% (7 out of 142 patients). In a study conducted by Ziemski JM, Rudowski WJ, Jaskowiak W, Rusiniak L, Scharf R, the mortality rate was 4.7%. In another study, it was 4%. Thus, the mortality rate in this study is higher than in the two studies above. This may be due to the lower number of cases covered in this study.

#### REFERENCES:

1. ELSADAWY, ESSAM. "The Effectiveness of Gastrografin Study and Multidetector CT Study in Evaluation of Early Complications of Laparoscopic Sleeve Gastrectomy Complications." *The Medical Journal of Cairo University* 87, no. December (2019): 5113-5120.
2. Peng, Fangyi, Li Lai, Ming Luo, Song Su, Mengyu Zhang, Kai He, Xianming Xia, and Pan He. "Comparison of early postoperative results between robot-assisted and laparoscopic splenectomy for non-traumatic splenic diseases rather than portal hypertensive hypersplenism-a meta-analysis." *Asian journal of surgery* 43, no. 1 (2020): 36-43.
3. Ding, Peng, Ziming Gao, Chen Zheng, Junqing Chen, Kai Li, and Shan Gao. "Risk evaluation of splenic hilar or splenic artery lymph node metastasis and survival analysis for patients with proximal gastric cancer after curative gastrectomy: a retrospective study." *BMC cancer* 19, no. 1 (2019): 905.
4. Matsui, Satoshi, Toshiro Ogura, Daisuke Ban, Kosuke Ogawa, Hiroaki Ono, Yusuke Mitsunori, Atsushi Kudo, Shinji Tanaka, and Minoru Tanabe. "Position of the Pancreas Division Line and Postoperative Outcomes After Distal Pancreatectomy." *World journal of surgery* 44, no. 4 (2020): 1244-1251.
5. Hamdy, Al Sayed Ahmed, Mohamed Fathi Labib, and Ahmed Talaat Gomaa. "Evaluation of Laparoscopic Splenectomy in Idiopathic Thrombocytopenic Purpura." *The Egyptian Journal of Hospital Medicine* 74, no. 6 (2019): 1406-1415.

6. Singh, Nikhil. "Assessment of post operative complication in patients underwent splenectomy." *International Journal of Surgery* 4, no. 1 (2020): 68-70.
7. Dang, Khiem Tran, Shigeyuki Naka, Vinh Quoc Nguyen, Atsushi Yamada, and Tohru Tani. "Functional Evaluation of a Novel Microwave Surgical Device in a Canine Splenectomy Model." *Journal of Investigative Surgery* (2019): 1-8.
8. Galata, Christian, Susanne Blank, Christel Weiss, Ulrich Ronellenfitsch, Christoph Reissfelder, and Julia Hardt. "Role of Postoperative Complications in Overall Survival after Radical Resection for Gastric Cancer: A Retrospective Single-Center Analysis of 1107 Patients." *Cancers* 11, no. 12 (2019): 1890.
9. Srivastava, Manoj Kumar, and Alok Kumar Maurya. "Assessment of Cases of Splenectomy- A Clinical Study." *Journal of Advanced Medical and Dental Sciences Research* 7, no. 4 (2019).
10. Manciu, Simona, Georgiana-Aurelia Nae, Adriana Diaconu, Anca Colita, Mihnea P. Dragomir, Raluca Purnichescu-Purtan, Stefan Tudor, and Catalin Vasilescu. "Long-Term Evaluation of the Outcomes of Subtotal Laparoscopic and Robotic Splenectomy in Hereditary Spherocytosis." *World Journal of Surgery* (2020): 1-9.
11. Collard, Maxime, Tiziana Marchese, Nathalie Guedj, François Cauchy, Caroline Chassaing, Maxime Ronot, Safi Dokmak, Olivier Soubrane, and Alain Sauvanet. "Is routine splenectomy justified for all left-sided pancreatic cancers? Histological reappraisal of splenic hilar lymphadenectomy." *Annals of surgical oncology* 26, no. 4 (2019): 1071-1078.
12. Abdel-Rahman, Amgad S., Fatma MM Salama, and Sayed HM Mohamed. "Value of Multi-Slice Computed Tomography in The Evaluation of Postoperative Complications After Laparoscopic Sleeve Gastrectomy." *The Egyptian Journal of Hospital Medicine* 79, no. 1 (2020): 469-480.
13. Pisapia, Anna, Enrico Crolla, Michele Saracco, Alessandro Saggioccolo, Pasquale Dolce, and Carlo Molino. "The effectiveness of Hemopatch™ in preventing postoperative distal pancreatectomy fistulas." *Expert review of medical devices* 16, no. 3 (2019): 253-256.
14. Hajibandeh, Shahab, Shahin Hajibandeh, Ifrah Hussain, Abdullah Zubairu, Fayyaz Akbar, and Andrew Maw. "Comparison of extended right hemicolectomy, left hemicolectomy and segmental colectomy for splenic flexure colon cancer: a systematic review and meta-analysis." *Colorectal Disease* (2020).
15. Gunay, Yusuf, and Ilhan Tasdoven. "The risks and benefits of non-predictive splenectomy: The necessity of splenectomy and early postoperative outcomes." *Trauma* 16 (2019): 23-9.