

Laparoscopic splenectomy for haematological disorder: our experience

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Abstract

Laparoscopic splenectomy has universal acceptance due to less morbidity and decreased incidence of peri-operative and postoperative complication. It is not a popular procedure in Pakistan due to technical challenges. Here, we are presenting our experience of laparoscopic splenectomy for haematological disorders at Aga Khan university hospital.

A total of seven cases, underwent elective laparoscopic splenectomy for haematological disorders. The operative time was less than 3 hours with minimal blood loss with rapid and uneventful recovery. There was no procedure related morbidity or mortality; however, one patient expired due to overwhelming post splenectomy sepsis.

Our initial report highlights the safety of laparoscopic splenectomy and we propose it to be the procedure of choice in elective splenectomy.

Keywords: Laparoscopic splenectomy, Open splenectomy, Idiopathic Thrombocytopenic Purpura.

Introduction

Splenectomy for the treatment of haematological disorder has been well recognized therapeutic modality. Since it was initially described in hereditary spherocytosis, in 1910 and for ITP in 1916.¹

Several authors have reported series of Laparoscopic splenectomy (LS); an operation which is feasible, safe and has demonstrated increasingly consistent results.² Most of these authors report encouraging data with regard to peri-operative morbidity, complications and patient reoperation.¹⁻³ The most frequent medical indication is haematological disorders i.e. ITP (Idiopathic Thrombocytopenic Purpura), lymphoma, autoimmune haemolytic anaemias, splenic cyst, Evan and Felty syndrome, and hypersplenism in leukaemia and thalassaemia.

Laparoscopic splenectomy was introduced a decade ago and has been described as a safe and feasible alternative to open splenectomy both in children^{4,5} and adults. Successful laparoscopic splenectomy has been reported with distinctive advantage of shorter hospital stay, lower incidence of post operative acute chest syndrome and lower wound related complications.⁶ The decrease in the incidence of post operative acute chest syndrome in lap splenectomy (5.2%)

compared to open procedure(33.3%) has been attributed to several factors including reduced manipulation and disruption of fat during laparoscopy, preventing fat embolism and thrombosis in locally damaged tissue vessels reduced.⁷

Although LS with its advantages was introduced in late 80s, but in Pakistan limited data is available. Following are a few cases done in Aga Khan university hospital over a period of 10years.

Case Report

Case #1:

A 24 years old female, known case of ITP and hypertension received steroids therapy for ITP that failed to increase the platelet count and finally was planned for splenectomy. Preoperatively ultrasound done was normal. The patient had very low platelets <50000/dl. Total splenectomy was done laparoscopically. Total duration of surgery was <2 hours, there was minimum blood loss and patient did not require blood transfusion postoperatively. He was discharged within 5 days and followed up in the clinic with no post operative complications and good cosmesis. Post operatively platelets remained between 150000-400000/dl.

Case # 2:

A 24 years old male with primary disease of congenital dyserythropoetic anaemia and refractory anaemia, was managed with repeated blood transfusions. Patient was electively admitted for splenectomy. His preoperative haemoglobin was 6.5gm/dl. Ultrasound showed moderately enlarged spleen. He underwent hand assisted laparoscopic splenectomy. Total duration of surgery in this high risk patient was 3 hours with blood loss of between 200-500ml. Post operative haemoglobin was between 11-12gm/dl. He was followed up in the clinic with no complications.

Case # 3 and Case # 4:

A 44 years old female patient, known case of ITP, had persistently low platelets refractory to steroid therapy. Ultrasound showed normal spleen but platelets persistently remained <10000/dl. She underwent splenectomy with hand assisted laparoscopic splenectomy. Total duration of surgery was <3hrs with peri-operative minimum blood loss. Post

operatively, she was discharged within 5 days and no postoperative complication seen. Post operative platelets remained >400000/dl.

Another 28 years old female patient had similar history and underwent laparoscopic splenectomy with three hours operative time and minimal blood loss. Post operatively she was discharged within 5 days and no postoperative complication was seen. Post operative platelets were >400000/dl.

Case # 5:

A 39 years old female with primary diagnosis of chronic myeloblastic leukaemia had three cell lines depressed due to hypersplenism. Preoperatively her platelets were only <50000/dl. She received steroid and azathioprine for the primary disease. She underwent laparoscopic splenectomy with <3 hours operative time and minimal blood loss. She was discharged within 5 days without any complications.

Case # 6:

A 65 years old male, known case of ITP, had very low platelets of <5000/dl refractory to medical management, underwent laproscopic splenectomy. Perioperatively patient remained well with minimum blood loss and there was improvement in the platelet count after splenectomy. However, patient developed overwhelming post splenectomy infection and expired secondary to severe sepsis.

Case # 7:

A 15 years old male, known case of ITP for 10 years, presented with complaint of bruises and gum bleed. He was on steroids and azathioprine for 4 months but there was no improvement in platelet count. His pre-operative platelet count was 18000/dl. He underwent laparoscopic splenectomy and was discharged after 6 days of hospital stay. His post operative platelet count was 324000/dl. He did not have any post-operative complication.

Discussion

Advances in skills and technology have enabled surgeons to opt for laparoscopic surgeries instead of the open ones. This has lead to a wide range of open procedures to be replaced by minimally invasive counterparts.⁸

For LS, patients were given a single dose of Gram positive antibiotic prophylaxis at the time of induction and received 250 milligram intravenous hydrocortisone and half Mega Unit of platelets before start of anaesthesia. After intubation a nasogastric tube and Foley's catheter was passed. The patient was placed in a semi lateral decubitus posture in reverse Trendelenburg position.

After insertion of a 10 mm umbilical port via Hassan's

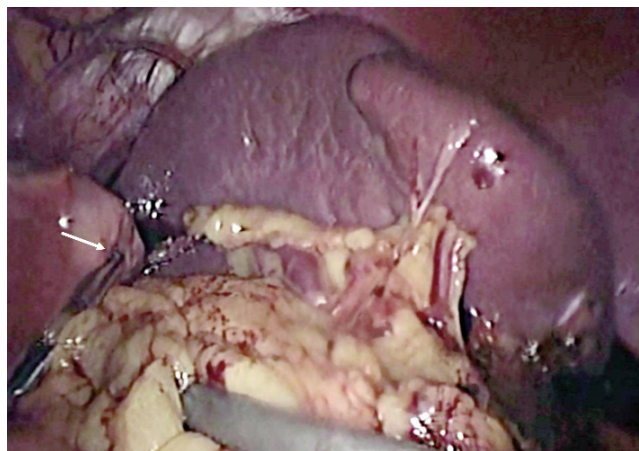


Figure-1: Division of short gastric vessels with harmonic (arrow).



Figure-2: Application of stapler (Endo GIA ©Ethicon) for division and ligation of hilum.

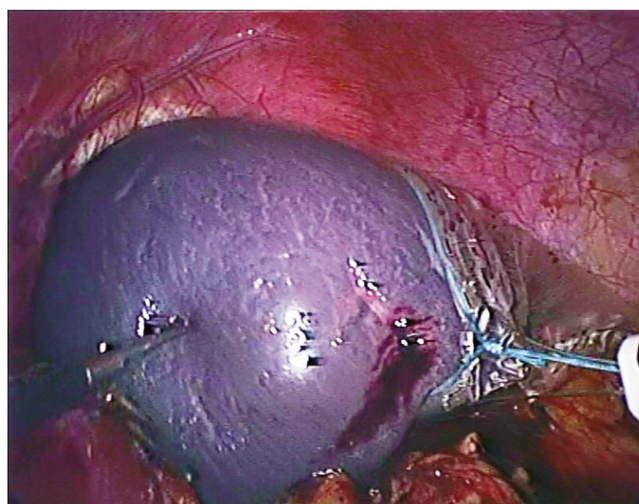


Figure-3: Spleen being pushed into bag for retrieval.



Figure-4: Final picture of abdomen at the end of surgery showing port sites (black arrow 10mm port and arrow heads 5mm ports) and site of removal of spleen through a 13mm port site (White arrow).

technique, pneumoperitonium was created. Further two 5 mm ports are introduced along the costal margin and a third port (13 mm) was introduced at the level of the 11th rib along the anterior axillary line as shown in Figure-4.

After laparoscopic examination to search for an accessory spleen, the dissection began at splenic flexure with a harmonic ultrasonic dissector. The gastrocolic ligament was opened and short gastric vessels were divided using a harmonic dissector (Figure-1). The dissection proceeded cephalad along the greater curvature till all short gastric vessels were divided and stomach fell away from the spleen. Next, the splenorenal ligament was divided. The spleen was just hanging by the phrenosplenic ligament.

Attention was focused to splenic hilum, a plane was developed behind the pedicle and this was encircled using vascular loops, the hilum was then stapled and divided using a laparoscopic vascular endostapler (Figure-2). Usually two 75 mm cartridges are required to divide the hilum. The stapling device was introduced through the 13 mm port. Once the hilum was divided the remaining mega unit of platelets was transfused.

At this stage spleen was hanging by a very small part of phrenosplenic ligament, a small bag fashioned from a urine

collection bag was introduced in the peritoneal cavity and spleen was placed in the bag (Figure-3). The bag was partially retrieved through 13 mm port and at this point a small incision was given through this port making it a 5 cm incision. The spleen was retrieved in a piece meal fashion.

In one study, 103 patients underwent laparoscopic splenectomy with conversion of only 4 patients to open due to haemorrhage. The mean post surgical stay was 2.5 days and 5.8% patients developed post surgical complications including pneumonia, pleural effusion, and post surgical ileus which resolved spontaneously.⁸ In another study, 147 patients underwent LS, with longer mean operative time for LS than OS (145.1 vs. 77.3 minutes) but mean intraoperative blood loss was significantly lower in LS.¹

Similarly, in our cases, there was minimal intraoperative blood loss, quick recovery and no complications; however, one patient expired secondary to overwhelming post splenectomy sepsis.

It is well proven from literature, that laparoscopic splenectomy has universal acceptance due to low postsurgical pain, hospital stay, incidence of post operative acute chest syndrome and wound related complications. Moreover, decrease manipulation and disruption of fat during laparoscopy procedure prevents fat embolism and thrombosis in locally damaged tissue vessels.^{1,7}

LS has been criticized due to limited tactile feedback and inability to identify accessory splenic tissue. Failure to find and destroy accessory splenic tissue may lead to treatment failure in case of primary splenic malignancy.⁹ It is crucial to avoid iatrogenic splenic rupture. Therefore, splenic size and surgeons experience are key determining factors when deciding on an open hand assisted or a total laparoscopic splenectomy.

The key reason of presenting these cases is that although laparoscopic splenectomy had been introduced a decade before and the first case in Pakistani literature was reported in 1992, it is not yet commonly performed because it remains an advanced technique. Like other solid organs laparoscopy procedures, it possesses specific technical challenges.² Some of these challenges are lack of tactile feedback,¹⁰ difficult assessment of accessory spleens,^{10,11} use of harmonic scalpel and endostapler¹⁰ and laparoscopic control of bleeding, and finally the removal of spleen. All these reasons make LS a technically difficult procedure with steep learning curve achieved after at least 20 LS. So, the crucial adjuvants to a laparoscopic surgeon for LS are patient selection, experienced anaesthesia team and a multidisciplinary approach to prevent and manage complications.

Our initial report highlights the safety of laparoscopic splenectomy and opens the horizons of laparoscopic splenectomy in a developing country.

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