CASE SERIES

Laparoscopic Splenectomy for Splenomegaly: Case Series with Literature Review

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Abstract

Aim and background: Laparoscopic splenectomy for enlarged spleen even for massive splenomegaly can be accomplished with a good overall outcome. Removal of specimens in toto, without morcellate, is also beneficial as it decreases the chances of splenosis.

Case description: Here we are presenting our early experience of laparoscopic splenectomy in five cases where one patient had massive splenomegaly.

Conclusion: Laparoscopic splenectomy for an enlarged spleen is a safe technique as it causes less post operative pain and the need for analgesia, early recovery, and less postoperative complication in the form of atelectasis. Clinical significance: Splenectomy by laparoscopic should be attempted even in massively enlarged spleen and specimen should be taken out in toto.

Keywords: Case report, Extrahepatic portal vein occlusion, Laparoscopic Splenectomy, noncirrhotic portal fibrosis, Noncirrhotic portal hypertension, Pancytopenia, Splenomegaly.

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Background

A myriad of diseases cause enlargement of the spleen requiring its removal. Conventional open splenectomy is being replaced by a laparoscopic approach with, advancement in laparoscopic tools for ligation and the acquired experience of surgeons.

In cases of the massive spleen (spleen >20 cm in long axis), its removal mandates laparotomy through the left subcostal/midline incision often extended to the incision of the left hemidiaphragm. Laparoscopic splenectomy can be attempted in such cases with a positive outcome.

Here, we are presenting data and our experience of five cases of laparoscopic splenectomy done recently.

Out of these two cases were diagnosed as extrahepatic portal vein occlusion (EHPVO), one EHPVO with early cirrhosis (Child A), one case of hereditary spherocytosis, and one child with idiopathic thrombocytopenia.

Case Description

Case 1

A 37-year-old lady was diagnosed with massive splenomegaly clinically on an antenatal visit 5 years back outside our center. On further evaluation, her hematological parameters were hemoglobin (Hb) of 6 gm%, total leukocyte count (TLC) of 3300 mm^3, and platelets count was 20,000 mm^3. Her ultrasonography (USG) abdomen coupled with a color Doppler of the portosplenic axis revealed multiple cavernoma which replaced the portal vein, the spleen was enlarged 22 cm in long axis, perisplenic collaterals with coarse liver echo texture. She never had any symptoms neither in form of pancytopenia nor related to EHPVO and was nonbleeder. Her pregnancy was uneventful, and she delivered a normal baby by cesarean section.

After that she needed multiple hospitalizations with blood transfusion (4–6 times/year) for the last 10 years outside this center. She presented to our center and on further evaluation the diagnosis was confirmed as EHPVO, however, her liver size was reduced to 11 cm. In view of the long-standing history and reduced liver size on USG abdomen a possibility of Child A cirrhosis was made.

She underwent a laparoscopic splenectomy and biopsy of the liver. Specimen delivered in toto using improvised plastic endo bag (sterile urobag) by midline supraumbilical incision (Figs 1 and 2).

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Patient consent statement: The author(s) have obtained written informed consent from the patients (for case 1, 2, 4 & 5) and the patient's parents (for case 3) for publication of the case report details and related images.

Fig. 1: Specimen removed in toto

Fig. 3: Enlarged spleen seen on laparoscopy

Fig. 2: Final surgical scar and port sites

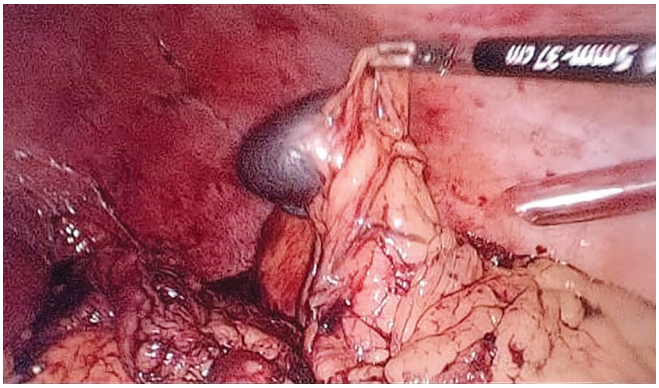


Fig. 4: Accessory spleen at hilum

Case 2

A 36-year-old lady diagnosed to have splenomegaly secondary to hereditary spherocytosis during evaluation for easy fatiguability. She was referred for splenectomy due to persistent anemias (Hb <10 gm%).

She underwent laparoscopic splenectomy. Intraoperative findings were splenomegaly with accessory spleen at hilum (Figs 3 and 4).

Prior to dissection at the hilum, control of the splenic artery was taken by applying Hem-O-lok clip. It reduces splenic blood flow thus the size of the spleen which facilitates handling better and lesser risk of intraoperative bleeding (Fig. 5).

Specimen removed in toto through midline incision is shown in Figure 6.

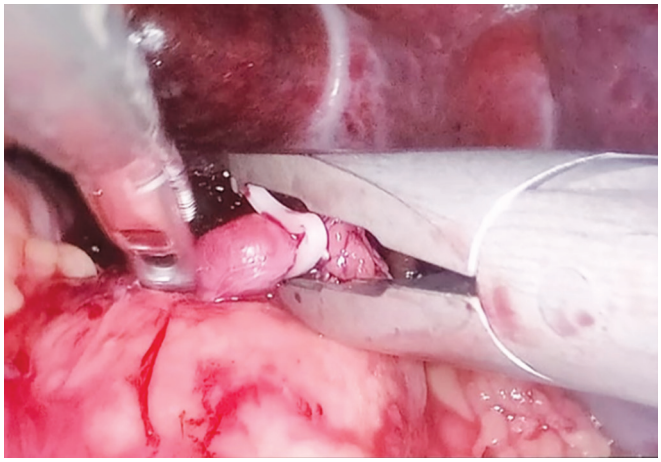


Fig. 5: Hem-O-lok application on splenic artery

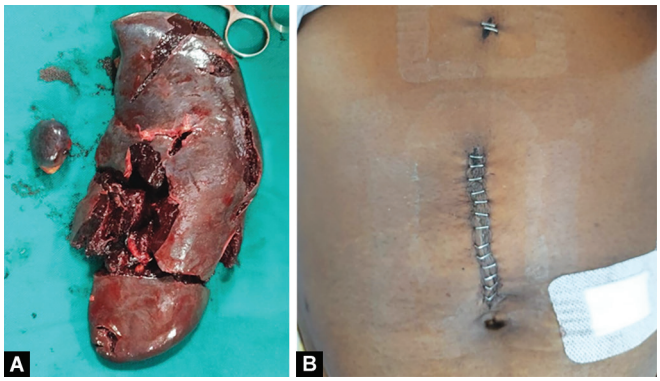
Case 3

A 14-year-old male child presented with a massive lower gastrointestinal (GI) bleed. On evaluation, he was anemic and had palpable splenomegaly. The further workup was diagnosed with persistent thrombocytopenia. He was initially managed symptomatically with a blood transfusion and subsequently underwent a laparoscopic splenectomy. We used the left-up position of the patient by tilting the table and preoperative marking of the spleen which guides port placement precisely (a total four ports of 01 × 10 mm, three ports of × 5 mm were placed) (Fig. 7). Specimen delivered by midline supraumbilical incision (Fig. 8).

Case 4

A 29-year-old lady presented with features of obstructive jaundice of 15 days duration. On evaluation by USG abdomen, multiple calculi were present in the common bile duct (CBD), portal cavernoma was present on color Doppler flow imaging (CDFI) splenoportal axis, and spleen was enlarged to 16 cm in long axis. She never had gastrointestinal bleeding or features of splenomegaly in the form of pancytopenia. She was initially managed with endoscopic retrograde cholangiopancreatography (ERCP) with CBD clearance with stent placement. During stent stent-free period, she again developed obstructive jaundice and magnetic resonance cholangiopancreatography (MRCP) revealed CBD stricture. So finally, she was planned for proximal splenorenal shunt (Linton shunt) followed by hepaticojejunostomy (HJ) later if required.

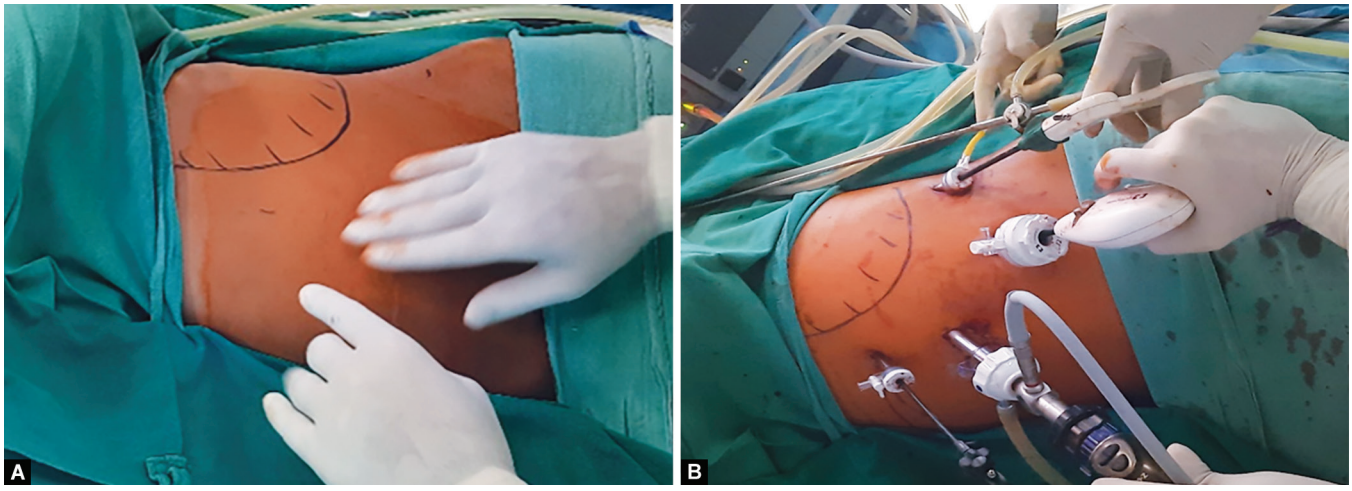
In this patient, a hybrid technique used as splenectomy done laparoscopically and subsequently shun surgery accomplished using a left subcostal incision (Fig. 9A).



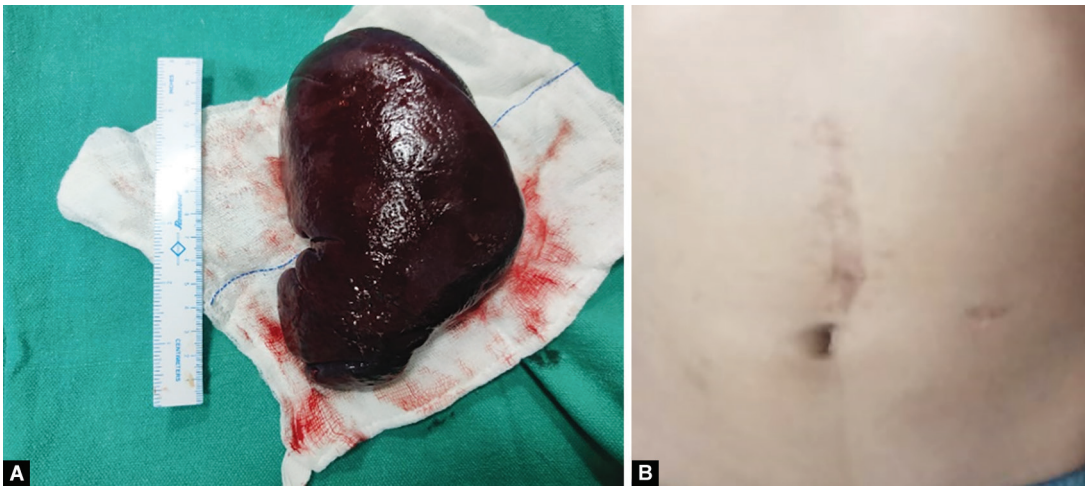
Figs 6A and B: (A) Specimen delivered in toto; (B) Final small surgical scar

Case 5

An 18-year-old girl was diagnosed with a case of EHPVO for 8 years. She initially presented with hematemesis and on evaluation found to have esophageal varices which were managed with endoscopic banding. She also developed pancytopenia with menorrhagia and multiple recurrences of GI bleed. She finally underwent laparoscopic splenectomy. Shunt procedure was not done due to nonshuntable splenic vein. Specimen removed through supraumbilical incision (Figs 9B and C).



Figs 7A and B: (A) Preoperative marking of the spleen; (B) Position of ports placed



Figs 8A and B: (A) Intact specimen; (B) Final healed small surgical scar

Figs 9A to C: (A) Specimen that was taken out in toto; (B) Specimen that was taken out in toto; (C) Final measurement of intact specimen

Discussion and Review of Literature

A myriad of causes [congenital, hematological, portal hypertension (HTN), etc.] leads to enlargement of the spleen. This enlarged spleen is usually required to be removed as it causes pancytopenia, poses a risk of rupture, or is a part of the Linton shunt.

Laparoscopic splenectomy has become the standard approach since 1991 when was first described by Delaitre and Maignien.[1] Moreover, the introduction of advanced laparoscopic tools for the ligation of vessels at the splenic hilum reduced the risk of intraoperative bleeding. It is considered a safe procedure, with a better overall outcome in comparison to the open approach, and the increased experience of surgeons allows operative times comparable to those of an open splenectomy.[2]

Traumatic splenic rupture (advanced grade) is the commonest indication for emergency splenectomy which is usually done by laparotomy in hemodynamically unstable patients. Laparoscopic splenectomy for trauma is reported only in some cases of hemodynamically stable low-moderate grade splenic injuries.[3]

In our series out of five cases, three patients were diagnosed as a case of noncirrhotic portal HTN while two cases of hematological disorders. All patients were vaccinated 4 weeks prior to surgery against *Streptococcus pneumoniae, Neisseria meningitidis, and Haemophilus influenzae* type b.

Three different patient positions to perform surgery have been described in literature anterior, hemilateral, and lateral position. These different patient positions have their advantages and disadvantages. We operated on all these patients in hemilateral position (right lateral 45° tilt of operation table). It allows easy division of short gastric vessels, and good access to the posterior surface and perisplenic ligaments. It also makes dissection and ligation of hilar vessels easier, by keeping the pancreatic tail away from hilar structures.[4] A single dose of prophylactic intravenous antibiotic (third-generation cephalosporin) was given just prior to intubation.

In patients with portal HTN extra precautions are taken during first port (camera port) placement as there is a risk of injury and subsequent bleeding from periumbilical collaterals. After creating the pneumoperitoneum, three additional 5-mm ports (two working and one in the left flank for an assistant to lift the spleen) were placed under vision.

Control of the splenic artery reduces the blood supply thus size of the spleen decreases which facilitates its manipulation and less risk of bleeding at the hilum.[5] We also took control of the splenic artery at the superior border of the pancreas by applying Hem-O-lok clips. Vessels at the splenic hilum can be divided by using an Endo GIA stapler with white reload or by applying a vascular clip.

Specimen usually delivered by putting it into a retrieval bag followed by morcellation. In our series, we removed the spleen in toto as it mitigates the risk of splenosis, and spillage of splenic tissue into peritoneal cavity and also provides intact specimen for histopathological (HPE) examination. Due to the very large size of the specimen in the first patient, we kept the specimen in a sterile urobag and thus delivered it in toto by a small supraumbilical vertical scar.

Incision to deliver spleen supra- or infraumbilical is also a matter of concern as both have pros and cons. Infraumbilical horizontal incision is better cosmetically accepted. Benefits of supraumbilical in patients needed to be reexplored for any postoperative bleeding from the surgical bed. In four patients, we used supraumbilical vertical while in one left subcostal incision to accomplish the shunt procedure.

Conclusion

The size of the spleen does not matter for the laparoscopic approach and the massive spleen can be removed through this method with the advantage of less postoperative pain, hospital stay, and better cosmetically accepted surgical scar.

Ethical Approval

All collected data are retrospective in nature and departmental permission is obtained to publish it.

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