Laparoscopic Splenectomy Benefits and Complications

Essay
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By
Yasser Ibrahim Farahat
M.B.B.Ch.

Supervised by:
Prof. Dr./ Samir Abdel Hameed Galal
Professor of General Surgery
Faculty of Medicine – Cairo University

Prof. Dr./ Moustafa Abdel Rahman ElShazly
Professor of General Surgery
Faculty of Medicine – Cairo University

Ass.Prof.Dr./ Mohamed Hassan Fahmy
Ass.Professor.of General Surgery
Faculty of Medicine – Cairo University

Faculty of Medicine
Cairo University
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Yasser Ibrahim Farahat

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Abbrev	
CRL	Crown-rump length
HIV	Human immunodeficiency virus
ITP	Idiopathic or immune thrombocytopenia purpura
LOS	Length of stay
LS	Laparoscopic splenectomy
OS	Open splenectomy
RBC	Red blood cell
SLE	Systemic lupus erythematosis
TTP	Thrombotic thrombocytopenia purpura

Abstract

The use of laparoscopy as a diagnostic method dates back to the first decades of this century. Laparoscopic surgical techniques were first used by gynecologists and later, in 1989, Dubois performed the first cholecystectomy using a laparoscopic approach. Since then, in the space of few years, there has been an overwhelming spread of video-laparoscopic operating methods, extending the therapeutic possibilities to gastroenterological surgery, as well as thoracic, oncological, urological and of course, gynecological surgery Over the recent years, laparoscopic splenectomy LS has become the preferred approach for the treatment of many conditions requiring splenic removal. At first, limited to small spleens and to benign hematologic disorders, this procedure is now used for a variety of indications

Key Word:

This study aims to highlight the benefits, safety and feasibility complications of laparoscopic splenectomy.

Introduction

The use of laparoscopy as a diagnostic method dates back to the first decades of this century. Laparoscopic surgical techniques were first used by gynecologists and later, in 1989, Dubois performed the first cholecystectomy using a laparoscopic approach. Since then, in the space of few years, there has been an overwhelming spread of video-laparoscopic operating methods, extending the therapeutic possibilities to gastroenterological surgery, as well as thoracic, oncological, urological and of course, gynecological surgery ***(Lombardo et al., 1994)***.

Over the recent years, laparoscopic splenectomy LS has become the preferred approach for the treatment of many conditions requiring splenic removal. At first, limited to small spleens and to benign hematologic disorders, this procedure is now used for a variety of indications ***(Brasesco et al., 2001)***.

LS for splenomegaly is feasible for experienced laparoscopic surgeons. For spleens weighing <2000 gms, the outcome was comparable to that of normal spleens,

whereas LS for spleens >2000 gms was associated with a higher conversion rate, greater blood loss, a longer hospital stay, an increased morbidity ***(Terrosu et al., 2002)***.

LS is being accepted as an effective alternative to open splenectomy in treating ITP ***(Aramaki et al., 2003)***.

Although a rare condition, wandering spleen can be diagnosed accurately by imaging studies, mainly CT scan and angiography. Nowadays, the laparoscopic approach is preferred and enables the surgeon to perform either splenopexy or splenectomy, depending on the vascular status of the spleen ***(Rosin et al., 2002)***.

Open partial splenectomy and laparoscopic cyst wall unroofing are both effective tools in the management of splenic non-parasitic cysts. Surgeons must master both techniques as nowadays spleen-preserving techniques should be attempted in every case of splenic non-parasitic cyst ***(Gianom et al., 2003)***.

LS is one of the best choices when proper indications exist and good techniques under laparoscopy are provided ***(Tan et al., 2001)***.

Aim of the Work

This study aims to highlight the benefits, safety and feasibility complications of laparoscopic splenectomy.

Surgical Anatomy of Spleen

The spleen is concealed at the left hypochondrium and is not palpable under normal conditions.

- It is related to the posterior portions of the left 9th 10th and 11th ribs, being separated from them by the diaphragm and the costodiaphragmatic recess ***(Harold Ellis and GrobIer, 1997)***.

I. Embryology of the Spleen:

In the first trimester of pregnancy, the fetal spleen is erythropoietic and myelopoietic. These functions are preempted successively by the liver and bone marrow. In human beings, splenic erythropoiesis fades after the fifth prenatal month ***(Leon Weiss and Roy Greep, 1977).***

The spleen begins to develop of mesodermal cells in the dorsal mesogastrium, which, because of the splenic presence becomes divided into lienorenal and gastrosplenic ligament. The spleen thus comes to lie at the left margin of the lesser sac ***(MacMinn, 1995).***

II. Gross Anatomy of the Spleen:

A. General anatomy: (fig. 1)

It is the largest single mass of lymphoid tissue in the body.

The spleen is about the size of the cupped hand. It forms the left lateral extremity of the lesser sac. It is about 12 cm long, 7cm wide and 4 cm thick in the adult ***(Harold Ellis and Grobler, 1997)***.

The spleen is concealed at the left hypochondrium and is not palpable under normal conditions.

It is related to the posterior portions of the left 9th, 10^{th} and 11^{th} ribs, being separated from them by the diaphragm and the costodiaphragmatic recess ***(Skandnlakis et al., 2000)***.

It is invested by two layers: an external serous layer of peritoneum and an internal fibroelastic layer or capsule ***(Harold EIlis and Grobler, 1997)***.

Peritoneal connections: (fig. 1)

The spleen is almost completely clothed with peritoneum and projects into the greater sac between the stomach and the lateral part of the left kidney.

TheGastrosplenic ligament: is a double layer of peritoneum that connects the left part of the greater curvature of stomach to the hilum of the spleen. It is continuous with the greater omentum below. In this double layer of peritoneum are the short gastric and the left gastro-epiploic vessels.

TheLienorenal or splenorenal ligament: is also a double peritoneal layer and extends between the hilus of the spleen and the anterior aspect of the left kidney. The splenic artery and vein lie within this ligament, as well as the tail of the pancreas

The phrenicocolic ligament: is a fold of peritoneum attaching the splenic flexure of the colon to the diaphragm at the level of the 10^{th} and 11^{th} ribs. The inferor part of the spleen restupon this ligment ***(Skandalakis et al., 2000)***.

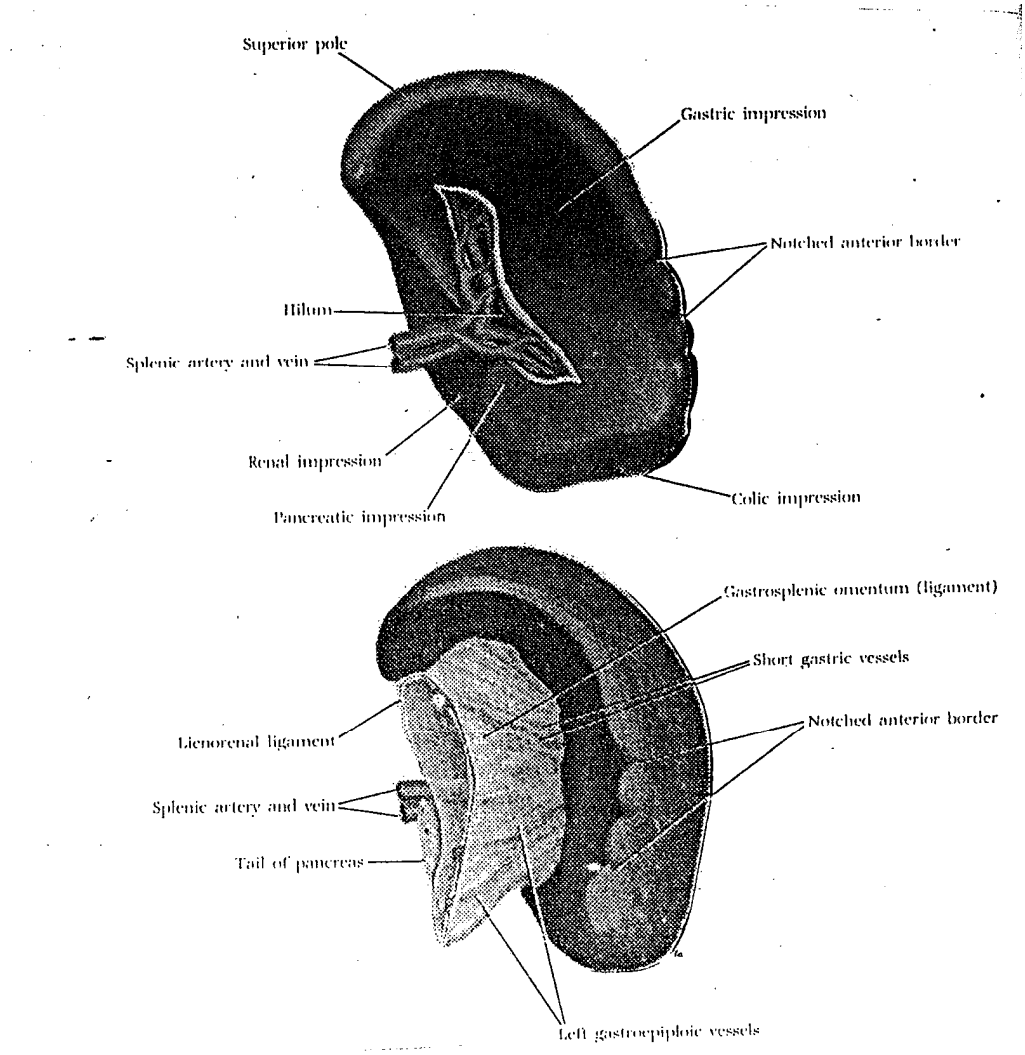

Figure 1: Peritoneal connectionsof the spleen. ***(Rischard rt al., 1978)***.

Relations:

- Posterior: the left cupala of the diaphragm, separate the spleen from the pleura, left lung and the 9th, 10th, 11th ribs.
- Anteriorly: the stomach.
- Inferiorly: the splenic flexure of the colon.
- Medially: the left kidney.

- The tail of pancreas about against the hilum of the spleen through which vessels and nerves enter this organ. ***(Harold Ellis and Grobler, 1997).***

Blood supply of the spleen:

Arteries: Fig 2:

The large tortous splenic artery runs transversely from right to left along the superior margin of the pancreas. In which it is sometimes embedded. It is the largest branch of the coeliac trunk it gives the following branches.

(1) The pancreatic branches

(2) The superior polar artery arises a distance from the hilus and before entering the spleen it gives off 5 to 7 short gastric arteries to the stomach.

(3) The left gastroepiploic artery runs along the inferior pole of the spleen to the greater curvature of the stomach and the greater omentum.

(4) The superior and inferior terminal arteries, about 5 or more.

(5) Inferior polar

Clinical consequences: if one of these vessels is damaged or blocked, no blood passes directly into area it normally supplies, consequently, an infarct may result ***(Harold Ellis and Grobler, 1997).***

The splenic vein:

It begins in several large branches leaving the hilum of the spleen. It has a much straighter course than the artery behind the pancreas from left to right. Then it Joins the superior mesenteric vein to form the portal vein.the spleneic vein Receives the short gastric veins, the left gastro-epiploic vein and several pancreatic veins

Before joining the superior mesenteric vein the inferior mesenteric vein joins the splenic vein behind the head neck area of the pancreas anterior to the inferior vena cava. The inferior mesenteric may drain directly into the superior mesenteric vein ***(Harold Ellis and Grobler, 1997)***.

Lymphatic drainage of the spleen:

The vessels from the capsule of the spleen enter the lymph glands at the hilum which drain the nodes along the splenic artery i.e. the pancreatlcosplenic glands and

finally into the coeliac glands. These nodes also receive lymph from the stomach and pancreas ***(Harold Ellis and Grobler, 1997)***.

Nerve supply:

It is derived from the celiac plexus and enters with the splenic artery, the fibers are principally not wholly sympathetic in origin and terminate at blood vessels and unstrained muscle fibers of the capsule of spleen ***(Harold Ellis and Grobler, 1997)***.

Abnormalities:

- **Absence:** very rare and most associated with a congenital - eardiac abnormalities and accessory lobes of the tongue.
- **Wandering spleen:** with torsion of its pedicle in which the normal attachment allows the spleen to move.
- **Accessory spleens (fig. 3):** Accessory spleens have been reported in 14 to 30 percent of patients, with a higher incidence occurring in patients operated on for hematological disorders.