

## Case Report

# Emergency Presentation of Spleen Associated Complication After Laparoscopic Sleeve Gastrectomy

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## Abstract

Laparoscopic Sleeve Gastrectomy (LSG) is a purely restrictive surgical procedure effective for the management of morbid obesity. Early post-operative complications include bleeding, staple line leak and development of an intra-abdominal abscess. Life-threatening spleen associated complications are rare. Herein, we present two rare splenic complications following LSG treated at our department. A 29 years old female patient presented 2 months following LSG to our emergency department with upper abdominal pain of acute onset.

By imaging studies, a hypodense lesion with irregular margins demonstrated at the upper pole of the spleen with small amount of free fluid. At surgery, a large abscess engulfing the spleen was seen in the left upper quadrant with complete disruption of the upper splenic pole. Splenectomy was completed. The second case is a 38 years old female patient presented to our emergency department, 10 days following LSG with weakness, dizziness and vomiting few hours prior to referral. On ultrasound, a large amount of hemoperitoneum was found. At surgery, a large amount of hemoperitoneum was seen along with active bleeding from splenic parenchyma. Splenectomy was done.

## Introduction

Obesity is defined as a BMI >30 and considered by the World Health Organization (WHO) to be a worldwide epidemic. Obesity is a disease affecting adults and children mainly in the industrialized countries and its effect on national health and cost is supreme [1]. Bariatric procedures were developed to combat obesity and are categorized as purely restrictive (adjustable gastric band, LSG), restrictive procedure with minor malabsorptive component (roux en y gastric bypass, single anastomosis gastric bypass) or largely malabsorptive procedure with a restrictive component (duodenal switch, biliopancreatic diversion). Sleeve gastrectomy was initially introduced in 1990 as an alternative to duodenal switch procedure to decrease complication rates [2,3].

Along with its restrictive nature, LSG may cause early satiety due to resection of the ghrelin producing part of the stomach [4]. Today sleeve gastrectomy is accepted as a standalone procedure

for the treatment of morbid obesity [5]. Complications following LSG could be categorized as acute (within two weeks) and late (after two weeks). Among the acute complications are hemorrhage, staple line leak and intra-abdominal abscess formation. Among the late complications are stricture formation, nutritional deficiencies and gastro-esophageal reflux. Spleen associated complications following LSG are rare [6]. We hereby report two cases of splenic complications following LSG presented to the emergency department at Rambam Healthcare Campus, Haifa, Israel.

## Case 1

A 29 years old, healthy female patient, presented to the emergency department with upper abdominal pain radiating to the left shoulder two months after LSG procedure. The pain lasted 12 hours with a progressive intensity. Chills, nausea and vomiting were observed. Two weeks prior her presentation she was diag-

nosed with upper respiratory tract infection and treated accordingly. Upon examination, she suffered from tachycardia of 120 b/min and temperature of 36.9°C. The abdominal examination revealed left upper quadrant tenderness. Digital rectal exam was normal. A complete blood count showed a normal white blood cell of 8700 and hemoglobin level of 12.6 mg/dl. Liver and kidney function tests were within normal limits. A computed tomography scan showed a hypodense lesion measuring 6×5 cm at the upper pole of the spleen with irregular margins, adjacent small amount of high viscosity free fluid suspected to be blood without contrast blush (Figure 1).



**Figure 1:** An axial computed tomography scan showing a hypodense lesion of at the upper pole of the spleen with irregular margins and with a nearby free fluid in small amount.

It was compatible with a 3rd degree splenic tear. The patient was admitted to the intensive care unit for stabilization and further management of a suspected spontaneous splenic tear. Few hours after ICU admission, the patient developed tachycardia of 130b/min, tachypnea of 30/min and fever of 38.7°C. Repeated complete blood count showed a drop-in hemoglobin level to 10.2 mg/dl and increase white blood cell count to 27000, with 14% bands. An ultrasound guided intra-peritoneal fluid aspiration revealed purulent blood and direct smear was positive for gram negative and gram-positive bacteria (later culture did grow *Streptococcus anginosus*). The patient was taken to the operating theater for exploratory laparotomy, during which a moderate amount of purulent fluid in the pelvis and left gutter was found, along with a large abscess at the

left upper quadrant engulfing the spleen and associated complete disruption of the upper pole of the spleen (Figure 2).

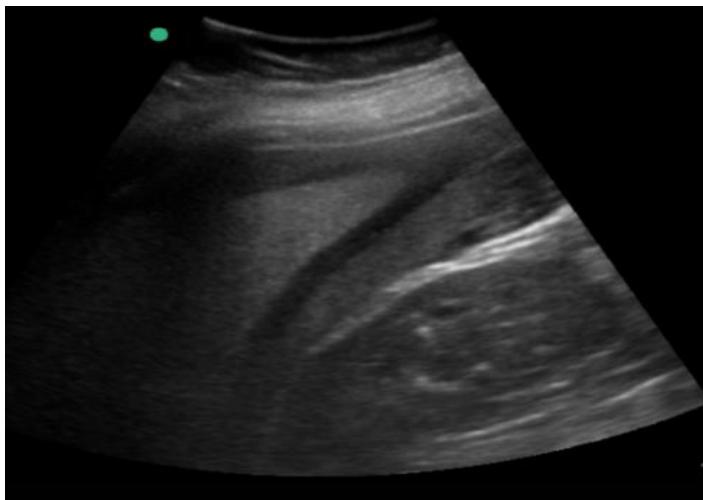


**Figure 2:** Complete disruption of the upper pole of the spleen.

No evidence of leakage from the staple line was noted. Splenectomy and peritoneal lavage were done. Her post-operative course was uneventful and was discharge home on POD nine.

## Case 2

A 38 years old female patient, presented to the emergency department complaining of severe weakness, dizziness, nausea and vomiting that started few hour prior referral, 10 days following uneventful LSG. Her past medical history was unremarkable. On physical examination, she looked pale and agitated, her vital signs showed fever of 38.1°C, tachycardia of 160/min, blood pressure of 77/45 mmHg and tachypnea of 30/min. on abdominal examination, the abdomen was soft and lax without tenderness. Digital rectal exam was normal. Arterial blood gases revealed severe metabolic acidosis with PH of 6.8, bicarbonate 9.3mmol/L, lactate 18mmol/L. Complete blood count showed increased white blood cells to 56000, with 18% bands and hemoglobin level of 9.5 mg/dl. She was intubated; two large bore intravenous cannulas were introduced along with a foley's catheter. She was resuscitated with intravenous crystalloids and treated with broad spectrum antibiotics to cover septic shock. A repeat complete blood count revealed a drop-in hemoglobin levels to 5.2 mg/dl. A bedside ultrasound scan showed large amount of hemoperitoneum (Figure 3).



**Figure 3:** An ultrasound scan showing hemoperitoneum at the hepatorenal recess.

and was diagnosed with both hemorrhagic and septic shock. The patient underwent an exploratory laparotomy, during which a large amount of hemoperitoneum was discovered. Ischemia of the upper pole of the spleen, diffuse active bleeding from splenic parenchyma was found as well. Fibrin along the staple line and evidence of methylene blue leakage from the upper part of the staple line were evident. Splenectomy, peritoneal lavage and drainage were completed. The patient received 8 units of packed cells and 4 units of fresh frozen plasma during the operation. On her post-operative care, the patient was NPO, treated with intravenous antibiotics, total parenteral nutrition. Later on, during the same admission endoscopy revealed a fistula opening at the upper part of the "Sleeve" and closure was achieved by an Over the Scope Clip (OTSC). An upper gastrointestinal series with gastrografin showed no evidence of leak and the patient proceed with enteral feeding. The patient was discharged home on POD twenty-nine.

## Discussion

Laparoscopic sleeve gastrectomy, also known as vertical gastrectomy [2,3], was first performed by Ren and colleagues in 1999 [7]. Post LSG complications can be classified as acute or chronic. The incidence of hemorrhage following LSG is 1-6% [2,8]. The source of bleeding can be categorized as intra-luminal source (bleeding from the staple line) or extra luminal source (as bleeding from the gastric staple line). Spleen associated complications after LSG, presenting as a life-threatening surgical emergency are extremely rare and include splenic abscess and splenic parenchymal bleeding. Splenic abscess as a complication of LSG is rare, and to the best of our knowledge, only seven cases were reported in the English literature [6,9-13]; most patients were im-

munocompetent and the index operation was uneventful, post-operative day of presentation range from as early as 14 days to as late as 77 days (Table 1).

immuno-suppression	Cultured organism	Evidence of leakage	Post-operative day of presentation	Age/sex	Case (reference)
Sakran, et al.	36/F	60	-	<i>Streptococcus</i> spp., <i>E.coli</i> , <i>E.faecalis</i>	no
Rojas, et al.	46/F	14	yes	<i>S.anginosus</i>	no
Avulov, et al.	19/M	14	no	<i>Salmonella</i> spp.	no
Sakran, et al.	35/F	75	no	<i>Staphylococcus</i> spp., <i>Enterobacter cloacae</i> , <i>Streptococcus mitis</i>	no
Singh, et al.	44/M	70	no	<i>K.pneumoniae</i> , <i>Streptococcus pneumoniae</i> , <i>Acinetobacter</i>	no
Schiavo, et al.	26/M	77	no	<i>S. anginosus</i>	no
Miguel, et al.	45/F	20	no	<i>S. anginosus</i>	no

**Table 1:** splenic abscess following LGS.

A predisposing factor to the development of splenic abscess following LSG includes iatrogenic splenic injury, inadvertent splenic ischemia and staple line leak [10-13]. Herein, we present the 8th case of splenic abscess following LSG, and we assume that ischemia of the upper pole of the spleen a predisposing factor.

Post LSG hemorrhage in the context of gastric fistula is a rare but a unique entity; that is poorly reported in the literature. These cases have a highly variable time of onset ranging from 9-118 days, and are usually the result of bleeding pseudoaneurysm [14]. To our knowledge, bleeding splenic parenchyma following complicated LSG has never been described before in the literature.

## Conclusion

Splenic complications after sleeve gastrectomy are a well-established yet rare complication. High index of suspicion is the key for prompt diagnosis. Treatment begins with rapid resuscitation and usually require invasive intervention (operation, drainage) for best outcomes.

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