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Surgical Management of Massive Splenomegaly and Life-Threatening Hypersplenism in a Young Female with Decompensated Liver Cirrhosis

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Abstract: ***This case report discusses a 25-year-old female (G3P3L3) presenting with melena, abdominal pain, and massive splenomegaly (26 cm). Investigations revealed liver cirrhosis with clinically significant portal hypertension, Grade 3 oesophageal varices, GAVE, and profound pancytopenia. Despite high indirect bilirubin (8.08 mg/dL) and Child-Pugh Class B status, the patient underwent successful splenectomy after vaccination. Post-operative results showed immediate reversal of hypersplenism and stabilisation of liver markers. This case highlights the role of splenectomy in correcting hematological profiles in cirrhotic patients to improve quality of life and reduce variceal pressure.***

Keywords: Splenectomy, Hypersplenism, Portal Hypertension, GAVE, Liver Cirrhosis

1. Introduction

Portal hypertension secondary to liver cirrhosis often leads to congestive splenomegaly. In the Indian subcontinent, massive splenomegaly frequently results in hypersplenism, characterised by the premature destruction of blood cells. While liver transplantation remains the definitive cure for cirrhosis, splenectomy serves as a vital therapeutic intervention for managing symptomatic massive splenomegaly and life-threatening cytopenias, particularly when medical management of portal hypertension is insufficient.

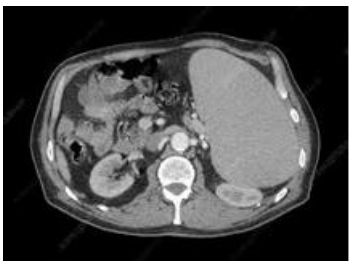
2. Case Presentation

A 25-year-old female, mother of three, presented with a 10-day history of abdominal pain, fever, and melena (black stools). Her past surgical history included an appendicectomy and hysterectomy three years prior.

3. Findings on Admission:

Blood investigations: Hb 9.9 g/dL, WBC 1,900/mm³, Platelets 36,000/mm³, Total Bilirubin 9.95 mg/dL (Indirect 8.08), Albumin 3.25 g/dL, AST 160, ALT 95, INR 1.47.

- **Bone Marrow:** Mild erythroid hyperplasia with megaloblastoid maturation (suggestive of compensatory effort against peripheral destruction).
- **Imaging (CECT):** Massive splenomegaly (26 cm) causing midline displacement of bowels and posterior displacement of the left kidney. Portal vein dilated to 14.5 mm; splenic vein dilated to 11 mm. No thrombosis was noted.
- **Endoscopy:** Grade 3 oesophageal varices and Gastric Antral Vascular Ectasia (GAVE).
- **2D echo:** reduced LV compliance.



Examination

- **General**: Marked pallor was present. Vitals were stable.
- **Abdomen**: Mild distension. A firm, massive splenic notch was palpable extending into the left iliac fossa. Dullness on percussion over the left side; normal bowel sounds.

Operative Management

Pre-operative Optimisation: The patient received the pentavalent vaccine and meningococcal vaccine.

Procedure: Operative Management: Open Splenectomy

The patient was placed in a supine position with a sandbag under the left flank to elevate the surgical field. A **left thoracodoral oblique incision** was preferred over a midline incision to provide direct, wide access to the 26 cm splenic mass and its vascular attachments.

Key Surgical Steps for Minimal Blood Loss:

- **Early Vascular Control:** To prevent "clumping" and excessive bleeding, the **splenic artery** was identified and ligated at the superior border of the pancreas before mobilising the spleen.
- **Stepwise Devascularization:** The short gastric vessels were divided using an electro-cautery to ensure secure hemostasis. The massive size of the spleen required careful mobilisation from the **phrenicosplenic** and **splenocolic ligaments**, which were thickened due to portal hypertension.
- **Hilar Management:** The splenic hilum was approached posteriorly. The dilated splenic vein (11 mm) was isolated and double-ligated. Minimal blood loss was maintained by

avoiding any capsular tear of the engorged spleen during its delivery through the wound.
- **Closure and Drainage:** After ensuring absolute hemostasis in the splenic bed, an abdominal drain was placed in to monitor for any reactionary haemorrhage.

Post-operative Care:
- **POD 1:** Nil by mouth (NBM).
- **POD 2–4:** Liquid diet.
- **POD 5:** Soft diet.
- **POD 11:** Discharged in stable condition.

Investigation	Preoperative	Post operative
Haemoglobin	9.9g/dl	10.8g/dl
WBC count	1900/mm3	15200/mm3
Platelets count	36000/mm3	312000/mm3
Total bilirubin	9.95mg/dl	Decreasing trend
INR	1.47	1.04
Albumin	3.25g/dl	3.8

Histopathological Finding:
confirmed congestive splenomegaly with degenerative changes.

The histopathology report (Congestive splenomegaly with degenerative changes) is the "gold standard" confirmation of your diagnosis.

4. Discussion

The most striking feature of this case was the **Indirect Hyperbilirubinemia (8.08 mg/dL)**. Unlike direct bilirubin, which signifies liver duct obstruction, this high indirect fraction combined with erythroid hyperplasia in the bone marrow confirms that the patient was suffering from significant **splenic hemolysis**.

Performing an open splenectomy by employing a **'vessels-first' approach**- ligating the splenic artery prior to mobilization- we achieved minimal blood loss.

The surgical removal of the 26 cm spleen effectively removed the "sink" where platelets and RBCs were being destroyed. This is evidenced by the post-operative platelet surge to **312,000/mm³**.

5. Conclusion

The management of massive splenomegaly by open **splenectomy** is a highly effective intervention for correcting profound hypersplenism and reducing the hemodynamic burden of portal hypertension in young, symptomatic patients.

The immediate post-operative normalisation of the platelet count (from 36,000 to 312,000/mm³) and the reduction of INR (1.47 to 1.04) highlight the spleen's role as a major site of haematological sequestration and consumption in cirrhosis. Furthermore, the presence of massive indirect hyperbilirubinemia in such cases should be recognised as a marker of splenic hemolysis. In carefully selected patients, particularly those with high-risk varices (Grade 3) and symptomatic cytopenias, splenectomy serves as a life-saving procedure that improves the haematological profile and stabilises portal hemodynamics.

Take Home Message
In young patients with massive splenomegaly (26 cm) and profound cytopenia, splenectomy remains a powerful tool to bridge the gap toward long-term stability. The rapid normalisation of platelet counts and INR post-surgery highlights that the spleen acts as a significant hemodynamic and haematological burden in the setting of 14.5 mm portal vein dilation."

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