

Splenectomy in Modern Surgery: From Hematologic Disorders to Trauma Care

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DESCRIPTION

Splenectomy, defined as the surgical removal of the spleen, remains an important procedure in modern surgical practice, offering therapeutic benefits in a variety of hematologic, traumatic, and oncologic conditions. The spleen, a highly vascular organ situated in the left upper quadrant of the abdomen, plays a critical role in the immune system by filtering abnormal erythrocytes, producing antibodies, and facilitating the maturation and proliferation of lymphocytes. Indications for splenectomy can broadly be classified into elective and emergent categories.

Elective splenectomies are commonly performed for hematological disorders such as Idiopathic Thrombocytopenic Purpura (ITP), hereditary spherocytosis, thalassemia, and select cases of sickle cell disease. In these scenarios, removal of the spleen can significantly reduce chronic hemolysis, prevent splenic sequestration crises, and improve overall hematologic stability. Traumatic splenic rupture, often resulting from blunt abdominal trauma such as motor vehicle collisions or sports injuries, represents the most frequent emergent indication, where timely surgical intervention is crucial to prevent life-threatening hemorrhage. Additionally, splenectomy is indicated in certain oncologic contexts, including primary or secondary splenic malignancies, where the spleen may serve as either the origin or a reservoir for pathological cellular proliferation.

Surgical techniques for splenectomy have evolved significantly over the past decades, offering surgeons multiple approaches tailored to patient needs. Traditional open splenectomy involves a laparotomy incision, allowing direct visualization and manipulation of the spleen and adjacent structures. While effective, this approach carries risks such as postoperative pain, longer recovery times, increased susceptibility to pulmonary complications, and greater potential for wound infection.

The development of minimally invasive techniques, particularly laparoscopic splenectomy, has transformed surgical practice. Laparoscopic procedures offer reduced postoperative discomfort, faster mobilization, shorter hospital stays, and improved cosmetic outcomes. Nevertheless, laparoscopic approaches

require advanced surgical skill, particularly in patients with massive splenomegaly or extensive perisplenic adhesions. More recently, robotic-assisted splenectomy has emerged as an alternative in specialized centers, providing enhanced precision, dexterity, and visualization, though the cost and availability limit widespread application.

Preoperative evaluation is a critical component in ensuring favorable surgical outcomes. Imaging studies, such as abdominal ultrasound or Computed Tomography (CT), are employed to assess splenic size, vascular anatomy, and the presence of accessory spleens, which, if left behind, may compromise the efficacy of the procedure in certain hematologic conditions. Laboratory assessment typically includes complete blood counts, coagulation profiles, and immunologic evaluation. Preoperative vaccination against encapsulated organisms-including *Streptococcus pneumoniae*, *Haemophilus influenzae* type b, and *Neisseria meningitidis*-is strongly recommended whenever feasible to reduce the risk of Overwhelming Post-Splenectomy Infection (OPSI), a rare but potentially fatal complication. Intraoperatively, meticulous hemostasis is essential given the spleen's friable parenchyma and high vascularity. Surgeons commonly employ vessel-sealing devices, ligatures, or surgical staplers to secure the splenic artery and vein, while taking care to avoid injury to nearby organs such as the pancreas, stomach, and colon.

Postoperative management addresses both immediate and long-term considerations. Early complications include hemorrhage, infection, pancreatitis, and inadvertent injury to surrounding structures, necessitating close monitoring of vital signs and hemoglobin levels, particularly in the first 48 hours post-surgery. Long-term follow-up emphasizes patient education regarding infection risk, adherence to vaccination schedules, and, in select high-risk populations, prophylactic antibiotic regimens. Although rare, OPSI can occur months or even years after splenectomy, making patient awareness and early intervention critical. In select cases, partial splenectomy or autologous splenic tissue implantation may be considered to preserve immunologic function, though these approaches remain largely experimental and are not widely adopted.

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CONCLUSION

splenectomy continues to serve as a crucial surgical intervention across a spectrum of clinical scenarios, ranging from hematologic disorders to trauma and malignancy. Advances in minimally invasive surgical techniques have enhanced patient outcomes, reducing morbidity while preserving efficacy. Nevertheless, the procedure carries inherent risks, particularly

related to infection and hemorrhage, underscoring the need for thorough preoperative planning, meticulous surgical technique, and vigilant postoperative care. Future research focused on immunologic preservation, refinement of surgical methods, and strategies to mitigate postoperative complications promises to further optimize the role of splenectomy in contemporary surgical practice, ensuring both safety and efficacy for patients undergoing this procedure.