

The pattern of indications and complications of splenectomy in Eastern Saudi Arabia

*Abdul-Wahed N. Meshikhes, MBChB (Dublin), FRCS, Mohammed A. Mubarek, MBBS, SBGS,
Amin I. Abu-Alrahi, MBBS, SBGS, Osama H. Al-Saif, MBBS.*

ABSTRACT

Objectives: The indications for splenectomy have changed over the past decade. Trauma and hematological diseases are emerging as common indications since the early eighties of the last century. This study looks at the pattern of indications and complications of splenectomy at Dammam Central Hospital, Dammam, Eastern Province, Kingdom of Saudi Arabia.

Methods: A retrospective study of all patients who underwent splenectomy at Dammam Central Hospital over the 5-year period (1996-2000).

Results: There were 55 patients (47 males and 8 females) who underwent splenectomy over the study period. The mean age was 57.5 (range 4-65) years. The most common indication was trauma (43.6%) followed by hematological reasons (25.5%), which were mainly in sickle cell disease (SCD) patients (N=9). Splenic sequestration crises were the most common indication in

SCD patients (77.7%). The mean weight of the excised spleen was 882.7 (range 85-1350) grams. There were 16 (29%) postoperative complications mostly encountered in patients with portal hypertension (46.2%). There were 2 deaths (3.6%) as a result of pulmonary embolism in a trauma patient and multi-organ failure in SCD. There was no reported postsplenectomy sepsis after a follow-up period of 18-72 months.

Conclusion: The most common indication for splenectomy in Dammam is abdominal trauma, followed by hematological diseases. Splenectomy in adult SCD population is uncommon. Conventional splenectomy has 29% complication rate especially in patients with portal hypertension. This calls for rapid introduction of minimally invasive approach to reduce the morbidity associated with open splenectomy.

Saudi Med J 2004; Vol. 25 (12): 1892-1895

The spleen is a prominent organ of the reticuloendothelial system that acts as a filter to bacteria and other particles from the blood stream. It clears unopsonized bacteria, serves as a reservoir of mononuclear cells and produces antibodies following exposure to various antigens. Loss of these 2 functions predisposes to an increased incidence of overwhelming sepsis in splenectomized individuals. However, splenectomy is generally indicated for trauma, some hematological diseases, tumors, abscesses, and hypersplenism or as part of another surgical procedure. First, splenectomy was documented in 1849 for splenomegaly.¹ In 1950's,

splenectomy for splenomegaly with hypersplenism was the most common indication. But in 1970's, splenectomy as part of staging laparotomy for Hodgkin's lymphoma became the most common indication.² With the introduction of sophisticated modern diagnostic and staging modalities, this indication became less common and splenectomy for trauma and hematological diseases emerged as the most common indication in 1980's of the last century³ and this trend may have continued into the new millennium.

We retrospectively reviewed the pattern of indications for splenectomy and postsplenectomy

From the Department of Surgery, Dammam Central Hospital, Dammam, Kingdom of Saudi Arabia.

Received 20th April 2004. Accepted for publication in final form 25th July 2004.

Address correspondence and reprint request to: Dr. Abdul-Wahed N. Meshikhes, Consultant Surgeon, PO Box 18418, Qatif 31911, Kingdom of Saudi Arabia. Tel. +966 505901984. Fax. +966 (3) 8551019. E-mail: meshikhes@doctor.com

complications in Dammam Central Hospital, Eastern Province of Kingdom of Saudi Arabia (KSA) over the last 5 years.

Methods. The case notes of all patients who underwent splenectomy at the Department of Surgery, Dammam Central Hospital over the 5-year period (1996-2000) were retrieved and reviewed. The demographic data, the indication for splenectomy, weight of the spleen, mode of prophylaxis and postoperative morbidity and mortality were particularly noted. The spleen was approached via an upper midline or a left subcostal incision. None of the patients underwent laparoscopic splenectomy. Patients requiring elective splenectomy were given vaccine prophylaxis against pneumococcal infection at least 2 weeks prior to operation. Those who needed emergency splenectomy as for trauma were given prophylaxis as soon as possible in the postoperative period. Postoperatively, patients were usually put on amoxicillin 250 mg twice daily as an antibiotic prophylaxis against postsplenectomy sepsis for at least the first 2 years after the procedure.

Results. Over the study period, 55 patients underwent splenectomy. There were 47 males and 8 females (40 Saudis and 15 non-Saudis). Their mean age was 57.5 (range 4-65) years. Administration of pneumococcal vaccine was documented in 45 cases (81.8%) while all sickle cell disease (SCD) patients received both pneumococcal and *Haemophilus influenzae* vaccines.

The indications for splenectomy were trauma, hematological reasons, portal hypertension, splenic tuberculosis, and as part of another operation (one was distal pancreatectomy for an infected pseudocyst at the tail of the pancreas⁴ and one for ruptured splenic artery aneurysm in a pregnant female) (**Table 1**). The hematological causes were

Table 1 - Complications for each indication category.

Indication	N of patients	N of complications n (%)
Trauma	24	5 (20.8)
Hematological	14	4 (28.6)
Portal Hypertension	13	6 (46.2)
Tuberculosis	2	1 (50)
Others	2	-

SCD (9), idiopathic thrombocytopenia (4), and hereditary spherocytosis (1). The indications for splenectomy in 9 SCD patients were repeated splenic sequestration crises (7), splenic abscess (1) and massive infected infarction (1). The mean weight of the excised spleens was 882.7 (range 85-1350) grams.

During the same period another 5 patients underwent splenorrhaphy and 2 others partial splenectomy for blunt abdominal trauma following road traffic accidents.

Only 18 patients (32.7%) were documented to have been given long term prophylactic antibiotics upon discharge, but their compliance was not documented in the outpatient follow up notes. There were 16 (29%) postoperative complications (**Table 2**). They were mostly pulmonary and wound-related (9 out of 16 cases) complications. The complications were mostly encountered in patients undergoing splenectomy for portal hypertension (46.2%) (**Table 1**). There were 2 deaths (3.6%) as a result of pulmonary embolism in a trauma patient and multiorgan failure in SCD patient who underwent splenectomy for massive infected infarction. After follow-up period of 18-72 months, there was no documented postsplenectomy sepsis.

Table 2 - Details of postsplenectomy complications for various indications.

Indication	Complication	N
Trauma (n=24)	Chest infection	3
	Atelectasis	1
	Adhesive intestinal obstruction.	1
Hematological (n=14)	Incisional hernia (HS)	1
	Hyperamylasemia (ITP)	1
	Chest infection (SCD)	1
	Postoperative bleeding (SCD)	1
Portal hypertension (n=13)	Incisional hernia	1
	Wound infection	1
	PVT	2
	Bleeding varices	1
	Hepatic encephalopathy	1
TB abscess (n=2)	Chest infection	1
Total (%)		16 (29%)
HS - hereditary spherocytosis, ITP - idiopathic thrombocytopenic purpura, SCD - sickle cell disease, PVT - portal vein thrombosis. TB - tuberculosis		

DISCUSSION. The spleen serves as an important function in the human body. It mainly filters and promotes immune responses. Splenectomy, therefore, leads to an increased incidence of overwhelming postsplenectomy sepsis (OPSS). Bearing in mind that the documented follow-up period was short, none of our patients was reported to encounter this serious complication. This risk is life long but most commonly occurs during the first 2 years after splenectomy and is associated with very high mortality. Therefore, the indication for splenectomy should not be taken very lightly. This life-threatening complication has led to a dramatic decline in the rate of splenectomy as it became apparent that splenic conservation in the form of splenorrhaphy or partial splenectomy for splenic injury does indeed reduce OPSS.^{3,5,6} During the study period, 7 patients with splenic injury due to blunt abdominal trauma were treated with such conservative measures; splenorrhaphy in 5 and partial splenectomy in another 2 patients. There is even a recent call for more conservative watchful approach^{3,5} especially in children with trauma. Adult general surgeons have however, a lower threshold for laparotomy in contrast to their pediatric colleagues.⁷⁻⁹

The most common indications for splenectomy in our center are trauma (43.6%) followed by hematological diseases (25.5%) and then portal hypertension (23.6%). Although SCD is prevalent in our area, it accounted for only 16.3% of the cases. This low incidence may be explained by the fact that splenectomy in SCD patients may be more commonly performed in the pediatric age group and there is no pediatric surgical service at Dammam Central Hospital.^{8,10} The pediatric patients in this study were those who were admitted as emergency and managed for abdominal trauma as part of poly trauma due to road traffic accident.⁷ Postoperative complications in this series are most commonly pulmonary (n=6; 37.5%) and wound-related (n=3; 18.8%). The complications were more commonly encountered in patients with portal hypertension who underwent splenectomy as part of surgery for portal hypertension; the majority of which were disease-related. The high complication rate of 46.2% in this group of patient can be explained by their poor general conditions at the time of surgery and the indication for which surgery was undertaken. Fortunately, the indication of splenectomy in this group of patients is becoming less common mainly due to recent advances in endoscopic methods and the increasing experience in non-surgical control of acute variceal bleeding. Another possible reason is the recent introduction of the new rules and regulations in the treatment eligibility of non-Saudi (expatriate) patients (such as Egyptians, Yemenis and Sudanese) in our hospital as well as in other government hospitals in KSA.

Although laparoscopic splenectomy is rapidly taking over conventional open splenectomy due to its numerous advantages,¹¹ none of our patients in this series had laparoscopic approach due to the lack of expertise and facilities. This seems to be the case in most surgical departments in the government hospitals in KSA. One would hope to see minimally invasive approaches are carried out more frequently for patients undergoing elective splenectomy especially for benign or malignant hematological diseases such as idiopathic thrombocytopenia purpura (ITP)¹² and if the spleen size allows in SCD patients.¹³ Its role may be extended gradually to management of blunt abdominal trauma with splenic injury if more facilities such as endostapler, harmonic scalpel, and red cell-saving machine are available.¹⁴ The availability of such essential facilities and disposables to perform safe laparoscopic splenectomy in the government hospitals, at the moment, is a far-fetched dream.

We conclude that the most common indication for splenectomy in our department is traumatic splenic injury, followed by hematological indications most commonly SCD and ITP. Although, our practice is in an area where SCD is prevalent, splenectomy in adult SCD population seems to be uncommon. The complication rate of conventional splenectomy is high approaching (29%) especially in patients with portal hypertension. The introduction of minimally invasive approach with all its advantages may help in reducing the morbidity and mortality associated with open splenectomy especially pulmonary, wound, and infectious complications.¹⁵

References

1. Brooks D. Surgery of the spleen. *Surg Clin North Am* 1975; 55: 287-301.
2. Marble KR, Decker PJ, Kern KA. Changing role of splenectomy for hematological disease. *J Surg Oncol* 1993; 52: 169-171.
3. Rose AT, Newman MI, Debelak J, Pinson CW, Morris JA Jr, Harley DD, et al. The incidence of splenectomy is decreasing: lessons learned from trauma experience. *Am Surg* 2000; 66: 481-486.
4. Meshikhes AW. Pancreatic pseudocyst. *Saudi Med J* 2003; 24: 411-414.
5. Velonovich V, Tapper D. Decision analysis in children with blunt splenic trauma: the effects of observation, splenorrhaphy or splenectomy on quality-adjusted life expectancy. *J Pediatr Surg* 1993; 28: 179-185.
6. Pachter HL, Guth AA, Hofstetter SR, Spencer FC. Changing patterns in the management of splenic trauma: The impact of non operative management. *Ann Surg* 1998; 227: 708-19.
7. Keller MS, Vane DW. Management of pediatric blunt splenic injury: comparison of pediatric and adult trauma surgeons. *J Pediatr Surg* 1995; 30: 221-225.
8. Meshikhes AW, Ali AA, Al-Dollah Q, Al-Kawi F, Al-Aithan A, Al-Mubarek M. The safety of pediatric blunt abdominal trauma in the hands of general surgeons. *Saudi Med J* 1998; 19: 52-55.

9. Bond SJ, Eichelberger MR, Gotschall CS, Sivit CJ, Randolph JG. Nonoperative management of blunt hepatic and splenic injury in children. *Ann Surg* 1996; 223: 286-289.
10. Al-Salem AH, Qaisaruddin S, Nasserallah Z, al Dabbous I, al Jam'a A. Splenectomy in patients with sickle-cell disease. *Am J Surg* 1996; 172: 254-258.
11. Cordera F, Long KH, Nagorney DM, McMurtry EK, Schleck C, Ilstrup D, et al. Open versus laparoscopic splenectomy for idiopathic thrombocytopenic purpura: clinical and economic analysis. *Surgery* 2003; 134: 45-52.
12. Knauer EM, Ailawadi G, Yahanda A, Obermeyer RJ, Millie MP, Ojeda H, et al. 101 laparoscopic splenectomies for the treatment of benign and malignant hematologic disorders. *Am J Surg* 2003; 186: 500-504.
13. Mahon D, Rhodes M. Laparoscopic splenectomy: size matters. *Ann R Coll Surg Engl* 2003; 85: 248-251.
14. Basso N, Silecchia G, Raparelli L, Pizzuto G, Picconi T. Laparoscopic splenectomy for ruptured spleen: lessons learned from a case. *J Laparoendosc Adv Surg Tech A* 2003; 13: 109-112.
15. Winslow ER, Brunt LM. Perioperative outcomes of laparoscopic versus open splenectomy: a meta-analysis with an emphasis on complications. *Surgery* 2003; 134: 647-653.