

Splenectomy in a general hospital

J M Glass BSc FRCS J M Gilbert MS FRCS

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SUMMARY

Splenectomy is often performed in patients with malignant disease or trauma who are at a high risk of complications. In the long term, it increases the risk of infection by encapsulated bacteria. An audit was performed to determine the reasons for splenectomy in a district general hospital, to review the results and complications of surgery, and to see how often the patients were prescribed antibacterial prophylaxis. Twenty-eight patients underwent splenectomy in 3 years. The indication was haematological disease in 13 and trauma in four. In the remaining nine the spleen was removed either as part of a radical gastrectomy or during some other abdominal procedure. Six of the 28 patients had died, one within 30 days from disseminated intravascular coagulopathy following an emergency gastrectomy and splenectomy for haematemesis, two from progressive haematological malignant disease, two from non-haematological malignancy, and one from bronchopneumonia. Of the nine patients (32%) with complications, three required a further laparotomy. Most patients had been prescribed pneumococcal vaccine (85%) and prophylactic antibiotics (93%).

INTRODUCTION

Splenectomy has been performed as a surgical procedure for over 2000 years: Plinius Secundus in the first century recorded that the 'spleen can be taken out by way of incision, and yet the creature can live nevertheless'¹. The operation became reasonably safe only in the latter half of this century, and the indications have been evolving over the past 15 years²⁻⁵. The operation is commonly done for life-threatening conditions but it carries substantial morbidity and mortality in its own right^{5,6}. The major late complication is infection by encapsulated organisms, notably *Streptococcus pneumoniae*. A vaccine against this organism has been available since 1977 and has long been recommended for splenectomized patients⁷; nevertheless, immunization rates have been very low in this group of patients⁸.

We conducted an audit of splenectomy in a general surgical unit to determine the reasons for operation and the frequency with which vaccination against *S. pneumoniae* was prescribed.

PATIENTS AND METHODS

All patients who underwent a splenectomy between January 1991 and December 1993 inclusive were studied, the analysis being conducted in May 1994. Information was

obtained from the patient administration system and the district information service and cross-checked with the histopathology department records to ensure that all splenectomized patients were included.

From the medical records we noted age at operation, sex, source of referral, consultant surgeon, diagnosis, and indication for splenectomy, and whether the operation was done electively or as an emergency. Length of hospital stay, admission to the intensive care unit, and post-operative complications were also recorded. Deaths were divided into those within 30 days of the procedure and those after 30 days.

The notes, drug information sheets, and discharge information charts were studied for evidence of whether pneumococcal, *Haemophilus influenzae B*, and meningococcal vaccinations had been administered. We recorded the timing of any vaccination in relation to operation and whether or not the patients had been discharged on prophylactic antibiotics.

RESULTS

Twenty-eight patients (14 men) underwent a splenectomy in the 3 years, and the mean follow-up was 14 months (range 6 days to 40 months). The mean age was 48.7 years (range 18-79 years). The indication for splenectomy was haematological disease in 13 (47%) and trauma in six patients (21%); the remaining nine (32%) had their spleens removed as part of another intra-abdominal operation. The details are in Tables 1 and 2. In 20 of the 28 patients

Department of General Surgery, Wexham Park Hospital, Wexham, Slough, Berkshire SL2 4HL, England

Correspondence to: Mr J M Glass, Registrar, Department of Urology, St Mary's Hospital, Praed Street, London W2 1NY, England

Table 1 Age of patients undergoing splenectomy over 3 year period from January 1991 to December 1993, by indication

Indication	Number of patients	Mean age (and range) (years)
Haematological disease	13	46 (18-79)
Trauma	6	34 (10-59)
'Coincidental' splenectomy	9	62 (42-75)
Total	28	48.7 (18-79)

Table 2 Haematological indications for splenectomy

Indication	No. of patients (%)
Idiopathic thrombocytopenic purpura	4 31%
Lymphoma	3 23%
Leukaemia	3 23%
Auto-immune haemolytic anaemia	2 15%
Thalassaemia	1 8%

splenectomy was an elective operation (or part of one); of the eight emergency splenectomies, six were for blunt trauma to the abdomen, one for spontaneous splenic rupture, and one as part of an emergency gastrectomy for haematemesis.

Five patients, all emergency admissions, required time on the intensive-care unit, ranging from 2 to 27 days; one of these died after 6 days. All the others admitted as emergencies were well at the time of data collection. The usual post-operative stay was 5-10 days (17 cases), range 3-60 days. Nine patients (32%) had complications. Three required a second laparotomy, two for haemorrhage within 48 h of the splenectomy (one elective and one emergency admission), and one (emergency admission) for early bowel obstruction on the 9th post-operative day. One patient

acquired an incisional hernia, repaired 9 months post-splenectomy. Deep venous thrombosis developed in one patient whose injuries included pelvic fractures and a tear of the inferior vena cava requiring cross clamping. Prophylaxis with anti-embolic stockings and subcutaneous heparin had been given. Other complications were one episode of pneumonia, two wound infections, one case of paralytic ileus, and a 2-day readmission of a patient with abdominal pain, which was treated conservatively.

Six of the 28 patients had died at the time of the audit. (Table 3). Only one death, from disseminated intravascular coagulopathy following a massive haematemesis, occurred within 30 days of the operation. Four were from progression of malignant disease (haematological in two). The remaining death was from bilateral basal broncho-pneumonia of rapid onset and development 41 days after splenectomy. The patient had been discharged from hospital 7 days after her splenectomy having received pneumococcal vaccine and having been prescribed phenoxymethylpenicillin. She died suddenly and the diagnosis was made at post mortem.

'Pneumovax' pneumococcal vaccine had been given to 85% of the patients. No patient had been immunized against *H. influenzae B* or meningococcal infection. Three patients undergoing elective operations received their immunization after splenectomy. Twenty-five of the 27 patients discharged home had been prescribed phenoxymethylpenicillin, or in those with a history of penicillin allergy, erythromycin.

DISCUSSION

Writing in 1984, Musser *et al.*⁵ reported a very substantial morbidity and mortality after splenectomy. Their in-hospital mortality rate was 9.25% compared with our 30-day mortality of 3.5% (one case). However, our complication rate (30%) is very similar to those reported elsewhere^{5,9,10}.

The most serious late complication of splenectomy is overwhelming sepsis, though not all workers accept that

Table 3 Age, indication, operative category, time from operation to death and cause of death in patients dying after splenectomy in period studied (January 1991 and December 1993)

Age at operation (years)	Indication	Elective/emergency	Time from operation to death (days)	Cause of death
40	Non-Hodgkin lymphoma	Elective	41	Bronchopneumonia
33	Chronic myeloid leukaemia	Elective	148	Progression of leukaemia
42	Gastrectomy for haematemesis	Emergency	6	Disseminated intravascular coagulopathy
68	Incidental during sigmoid colectomy	Elective	199	Progression of carcinoma of sigmoid colon
71	Gastrectomy for stomach cancer	Elective	117	Progression of carcinoma of stomach
47	Chronic lymphocytic leukaemia	Elective	463	Progression of leukaemia

the condition is a distinct clinical entity¹¹. Immunization has long been recommended¹², but in 1986–1990 only some 35% of British splenectomized patients received pneumococcal vaccine⁸. We now know that vaccination is far more effective when given before splenectomy^{9,12}. The immunization rate achieved in our audit was satisfactory at 85%; but three patients who underwent elective splenectomy received the vaccine postoperatively—something to be avoided in future. None of our patients had been immunized against *H. influenzae B* or meningococcal infection. Vaccines do now exist against these other encapsulated organisms, and their use in splenectomized patients is being evaluated¹³.

Penicillin prophylaxis is still recommended¹² and 92% of our patients were discharged on appropriate medication. None the less, one of these died of bronchopneumonia; such a case has been described elsewhere¹⁴. Patients need to be told of the possibility of rapid sepsis, and the use of an 'alert' bracelet or medical card has been proposed to sensitize attending physicians¹². The haematologists at this hospital now issue a card to asplenic patients.

It is, of course, best to avoid splenectomy where possible. The indications for splenectomy in haematological disease are still evolving^{2–4}. In this series the operation was performed for hypersplenism with consumption of platelets or erythrocytes or because of splenic infiltration with disease. Coincidental splenectomies represented 32% of this series, as in previous reports¹⁵. Coincidental splenectomy increases the morbidity and mortality of a procedure^{15,16} and splenic conservation should be attempted. In a large series of 205 cases of splenic trauma 80% were successfully managed non-operatively¹⁷. Mayo performed splenorrhaphy in a case of splenic trauma¹⁸, and similar techniques have been proposed both for trauma and for iatrogenic splenic injury¹⁹. It was not within the scope of this audit to study the number of patients undergoing a laparotomy for trauma in whom splenic injury was treated conservatively.

Most audits of splenectomy in the past have come from specialist centres looking at splenectomy in a specific patient group. This audit serves to show that splenectomy is a safe procedure when performed in a general surgical unit, but that the complication rate was substantial and the use of vaccination left room for improvement.

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