

## ORIGINAL ARTICLE

AUDIT OF SPLENECTOMY AT JINNAH POSTGRADUATE  
MEDICAL CENTRE, KARACHI

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**Objective:** Splenectomy is often performed in patients with hematological diseases or trauma who are at high risk of complications. Our aim is to perform an audit on splenectomy in order to determine the reasons for the operation, its complication and compliance with the recent recommendations for post-splenectomy patients at Jinnah Postgraduate Medical Centre. **Design:** It is a Descriptive study conducted in surgical ward 2 at Jinnah Postgraduate Medical Centre from June 2003 to June 2008. **Methods:** A retrospective review of hospital records of surgical ward 2 of consecutive splenectomy patients with a mean follow up of 12 months. **Results:** Fifty-five patients underwent splenectomy in 6 years duration. The mean age was 26.7 years. The indication for splenectomy was mainly hematological diseases and trauma. Vaccination was done in 83.6% patients. Twelve patients had postsplenectomy complications, although there were no cases of OPSI. Mean hospital stay was 6.4 days. **Conclusion:** We still lack compliance with the standard guidelines for post-splenectomy patients. There is space for an improvement of the vaccination rate and prophylactic antibiotic. Patients should be counselled for the risk of OPSI and should have a splenectomised card for prompt treatment. There is need for careful documentation of this important health risk and counselling of patients in the discharge summaries.

**Keywords:** splenectomy, pneumococcal, vaccination, antibiotic, prophylaxis

## INTRODUCTION

The spleen is the largest organ of the mononuclear phagocyte system and is involved in all systemic inflammation, generalized haematopoietic disorders as well as metabolic disturbances.<sup>1</sup> Being an organ that is interposed in the blood stream, it also stands as the body's largest blood filter that furthermore brings contribution to detecting senescent, mechanically damaged and aberrant cells. The spleen combines the innate and adaptive immune system in a unique way, releasing an immediate innate reaction to microbial penetration, but also an adaptive immune response that involves the interaction of cells that recognize a particular antigen, implicating MHC molecules presented by antigen-presenting cells.<sup>2</sup> Splenectomy has been performed as a surgical procedure for over 2000 years<sup>3</sup>. In 1887 Sir Spencer Well first ever performed successful splenectomies<sup>4</sup> but mortality was very high. The incidence of infection and mortality has decreased by 47% and 88%, respectively, with prophylaxis in some studies.<sup>5</sup> Asplenic individuals have major difficulties in coping with specific infections, especially those involving encapsulated bacteria, such as *Streptococcus pneumoniae*, and are at increased risk of serious sepsis, which may be fatal. The overall incidence of septicaemia is low in adults, but death rates from overwhelming post-splenectomy sepsis (OPSI) have been reported to be up to 600 times greater than in the general population, with an estimated life-time risk for OPSI of 5%.<sup>6</sup> Pneumococcal immunisation and low dose prophylactic penicillin may reduce the incidence of

pneumococcal infection in these patients,<sup>7,8</sup> and as deaths from pneumococcal septicaemia have been reported many years after splenectomy, prophylactic penicillin should probably be life long.<sup>9</sup> The indications for splenectomy in haematologic disorders have also changed considerably over the time. These changes have occurred mainly as a result of the evolution of the staging laparotomy to evaluate patients with Hodgkin's disease<sup>10-12</sup> and, to a lesser extent, non-Hodgkin's lymphomas.<sup>13-15</sup> specially due to improvement in imaging and chemotherapy. Although diagnostic splenectomy is currently an unusual indication for splenectomy, therapeutic splenectomy remains the treatment of choice for a variety of well-defined clinical and laboratory manifestations in several haematologic disorders.<sup>13</sup>

The recommended policy in UK for patients who had splenectomy has been shown in Figure-1.<sup>16</sup> This study is an audit to look at a tertiary care hospital's compliance with published guidelines for immunisations and antibiotic prophylaxis post-splenectomy.

## MATERIAL AND METHODS

All patients who underwent splenectomy between June 2003 and June 2008 were included and studied. The mean follow up was of 12 months (range from 6 days to 24 months). The analysis was done in January 2009. Information was obtained from patient record department. From the medical record we noted age, sex, consultant surgeon, diagnosis, indication for

splenectomy and whether the operation was done electively or as an emergency. Length of hospital stay, admission to intensive care unit, post operative complications and mortality were recorded. The notes, drug information sheet and discharge information charts were studied for evidence of whether pneumococcal, *Haemophilus influenzae B* and meningococcal vaccination had been administered. We recorded the timing of any vaccination in relation to operation and whether or not the patient had been discharged on prophylactic antibiotics.

**RESULTS**

Fifty-five patients underwent splenectomy in 5 year period. The mean ages of patients were 26.7 years (range from 16–55 years). The indication of splenectomy was Idiopathic thrombocytopenic purpura 19 (34.5%), trauma 11 (20%), Thalassaemia 5 (9%), hypersplenism 10 (18%), spherocytosis 2 (3%), hydatid cyst 1 (1.8%) and others 7 (12.7%). In 42 out of 55, splenectomy was an elective operation; of 13 emergency splenectomies, 11 were for trauma to abdomen and 2 patients had their spleen removed as part of operation for gastric malignancy. Three patients, all emergency admissions, shifted to the surgical ICU, and all of them recovered and shifted back to the ward. The usual postoperative stay was 6.4 days range from 4–18 days. Eleven patients developed postoperative fever and one had haemataemesis. No patient died after splenectomy during hospital stay.

Pre-operative pneumococcal, *Haemophilus influenzae* and meningococcal vaccine had been given to 42 patients. Out of 11 patients who underwent emergency splenectomy, 4 patients received their immunisation after splenectomy. In rest, the information was not mentioned in files. Over all the vaccination for pneumococcal, *Haemophilus influenzae* and meningococcal were given to 83.6% of patients who had their spleen removed. Phenoxymethylpenicilin was not given to any patient.

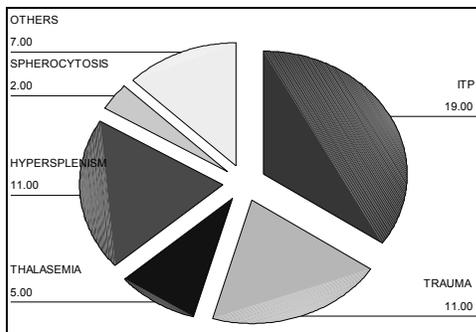


Figure-1: Frequency of causes for splenectomy

**DISCUSSION**

These audit findings are not different from other recently published audits of Splenectomy. Brigden *et al* survey

showed that only 68% of patients received pneumococcal vaccination.<sup>17</sup> Danish study by Ejstrup *et al* also reported a similar vaccination rate<sup>18</sup> A Scottish audit reported that only 37.4% of patients had splenectomy were both vaccinated and received antibiotic prophylaxis according to published guidelines.<sup>19</sup> In our audit we found that 83.6% of patients were vaccinated against pneumococcal, *Haemophilus influenzae*, and meningococcal bacteria, which was better than the previous reports. However bearing in mind the significant risk posed by pneumococcal infection this coverage should be nearer 100%. The recent British guidelines states ‘life long prophylactic antibiotics still recommended’, yet unfortunately none of our patients were advised regarding prophylactic antibiotics. Our complication rate of 20% was quite similar to that of Glass JM who reported 30% complications in his audit of splenectomy.<sup>19</sup> In study of Jockovich the rate of OPSI was 6.8% in 233 patients who underwent splenectomy for staging of Hodgkin disease<sup>20</sup> Our patients although developed fever and one had haemataemesis, but none of them developed serious OPSI. The indications for splenectomy in haematological disease are still evolving.<sup>10</sup> In this series the operation was performed for hypersplenism with consumption of platelets or erythrocytes, for spherocytosis, Thalassaemia and Idiopathic thrombocytopenic purpura.

Regarding mortality, Musser *et al*<sup>21</sup>, in 1984, reported a very high mortality and morbidity after splenectomy. In their report the mortality rate was 9.25% compared with our patients mortality during hospital stay was nil.

Laparoscopic splenectomy has become the standard approach for spleen removal in the non-acute setting. Laparoscopic splenectomy was done in three patients in our series, which confers them the traditional benefits of laparoscopy. But due to small number of cases it was not possible to compare it with open splenectomy.

Individuals without spleen in malaria endemic areas carry the risk of developing cerebral malaria, and consequently have to be on anti-malaria prophylaxis for life.<sup>22</sup> But none of our patients advised regarding malarial prophylaxis. It is strongly recommended that they should be given written information and carry a card or bracelet to alert health care professionals to the risk of overwhelming infection.<sup>7</sup> Our patients were provided a discharge card with information regarding diagnosis and procedure and were advised to always keep it with them. However the education given to the patients for prevention of sepsis after splenectomy was not documented in any file. Our audit of patients undergoing splenectomy over a 5 year period serves to show that splenectomy is a safe procedure when performed in a general surgical unit but we also are falling short of published recommendations<sup>9</sup> both in terms of

immunisation and prescribing of prophylactic antibiotics. It is also critical that patients are made aware that they are more susceptible to infection and that, despite appropriate measures, breakthrough infection may occur.

Pneumococcal immunisation —the available polyvalent vaccine should be given to all splenectomised patients. Re-immunisation should be performed every 5 years or given dependent on antibody levels *Haemophilus influenzae* type B (HIB) vaccine should be given to patients not previously immunised. (Routine immunisation of 1 year olds only began in 1992) Meningococcal group C conjugate vaccine should be given if not previously immunised (again only recently routinely given to children and teenagers). The group A conjugate vaccine should be given to travellers. Influenza vaccine is recommended yearly. Life-long prophylactic antibiotics are recommended (oral phenoxymethyl-

penicillin or an alternative). Patients should be given a leaflet and a card to alert health professionals to their risk of overwhelming infection. Patients should be educated as to the risks of overseas travel (Malaria) and animal bites. All records should be labelled. Vaccination and re-vaccination should be documented.

## CONCLUSION

Compliance with post-splenectomy prophylaxis needs to be improved. There should be 100% vaccination rates, and patients should be discharged with antibiotics and adequate information as to how and when to use them. The education and awareness of appropriate teams to this problem must be enhanced to improve treatment to those patients whose spleens are removed.

**Table-1: The 2001 guidelines for prevention of OPSI post-splenectomy**

Pneumococcal immunization—the available polyvalent vaccine should be given to all splenectomised patients.
Re immunization should be performed every 5 years or given dependent on antibody levels <i>Haemophilus influenzae</i> type B (HIB) vaccine should be given to patients not previously immunised. (Routine immunisation of 1-year-olds only began in 1992)
Meningococcal group C conjugate vaccine should be given if not previously immunized (again only recently routinely given to children and teenagers). The group A conjugate vaccine should be given to travellers
Influenza vaccine is recommended yearly
Life-long prophylactic antibiotics are recommended (oral phenoxymethylpenicillin or an alternative)
Patients should be given a leaflet and a card to alert health professionals to their risk of overwhelming infection
Patients should be educated as to the risks of overseas travel (Malaria) and animal bites
All records should be labelled. Vaccination and re-vaccination should be documented

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