

Evaluation of early Postoperative Complications of Splenectomy - An Experience of 30 Patients in Nishtar Hospital Multan

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ABSTRACT

Aim: To evaluate the percentage of different early postoperative complications.

Material & method: This is descriptive type of study with a purposive, non probability sampling technique. We included all the patients who have undergone open splenectomy either for trauma or for other medical conditions.

Duration: From July 2006 till December 2008, we have studied 30 patients.

Place of study: This study was carried out in the Department of Surgery, Nishtar Medical College/Hospital, Multan.

Results: In this study, a total of 30 patients were included. we have studied 30 patients. Out of these 30 patients, 18 were admitted in A&E department after trauma and remaining 12 patients were operated electively for medical conditions. Among these patients, highest number of patients undergoing splenectomy were in the age group 21-30 years, followed by group 31-40 years. There were 20 males (67%) and 10 females (33%).

Key words: Splenectomy, complications, postoperative

INTRODUCTION

Spleen, holding 50% of body's lymphoid tissue, has both hematological and immunological functions^{1,2}. it is mobile organ occupying the left upper quadrant and is one of the most commonly injured organ in road traffic accidents³. In civilian community blunt abdominal trauma is the most common cause as compared to penetrating trauma^{4,5}. Most common cause of splenectomy is splenic injury⁶. Other less common indications of splenectomy include hydrated cyst, rupture of diseased spleen, splenic vein thrombosis, blood dyscrasias⁹, myeloproliferative disorders¹⁰. Except in trauma setting, all other above mentioned conditions need proper preparation and planning prior to splenectomy.

There are many complications of splenectomy and these carry high mortality rate especially in emergency settings where patients are not properly prepared and vaccinated particularly against pneumococcus. Well documented complications include left basal atelectasis, haemorrhage, subphrenic abscess, damage to tail of pancreas, thrombocytosis, gastric fistula and fecal fistula because of colonic injury.

The objective of our study is to evaluate the percentage of different early postoperative complications.

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MATERIAL AND METHOD

This is descriptive type of study with a purposive, non probability sampling technique. This study was done in Surgical Unit III, Nishtar Hospital Multan. We included all the patients who have undergone open splenectomy either for trauma or for other medical conditions.

From July 2006 till December 2008, we have studied 30 patients. Out of these 30 patients, 18 were admitted in A&E department after trauma and remaining 12 patients were operated electively for medical conditions.

A preformed Proforma was filled for all identified information of the patients including biodata and preoperative and postoperative findings.

18 patients who were treated in emergency. Detailed history and clinical examination was recorded. Preoperative investigations included routine (CBC, CUE, grouping and cross matching), biochemical (S/E, RPM, RBS, LFTs), radiological (x-ray chest, USG abdomen) were done in all patients. ECG of patients above 45yrs was done. After final diagnosis, patients were operated in emergency. All these patients were given GA. Exploratory laprotomy was done through upper midline incision. Peritoneal lavage with 3 to 4 liters of normal saline was followed by placement of 2 intraperitoneal drains, 1 in subphrenic space and 2nd in pelvis. In immediate postoperative period patients were put on intravenous 3rd generation cephalosporins, strict fluid and electrolyte balance and proper analgesia. Drains were removed on 2nd or 3rd day. On 4th or 5th day

patients were allowed to take liquid diets. The vaccination against pneumococcus and hemophyllus influenza were done before the patients were discharged to home.

The remaining 12 patients out of 30 who were shifted from different medical and oncology wards already diagnosed and were shifted to our unit for splenectomy. In surgical floor before operation, vaccination against pneumococcus and haemophyllis influenza were given and splenectomy was performed on elective list. All the information regarding postoperative complications were recording and managed accordingly.

RESULTS

In this study, a total of 30 patients were included. Among these patients, highest number of patients undergoing splenectomy were in the age group 21-30 years, followed by group 31-40 years. There were 20 males (67%) and 10 females (33%), as shown in Table 1.

Twenty patients (67%) were from urban areas, while 10 patients (33%) were resident of rural areas (Table 2). Eighteen patients (60%) presented with splenic trauma, while 12 (40%) presented with other medical conditions (Table 7). Abdominal pain was the most common presentation. It occurred in 20 cases (66.7%) followed by shock in 15 cases (50%), while 1 case (3.3%) was having fever and 3 cases (10%) were having anemia. Tenderness was present in 18 cases (60%), positive Kehr’s sign in 12 cases (40%), splenomegaly in 3 cases (10%). Lymph nodes were palpable in 2 cases (7%) only.

Investigations performed in case of splenic trauma were, complete blood examination in 18 cases (100%), USG in 18 cases (100%) and chest x-ray in all 18 cases (100%). Investigations performed for other medical conditions were complete blood examination in 12 cases (100%), USG in 12 cases (100%), CT scan in 5 cases (41.7%) and angiography in 2 (16.7%).

The patients in which splenectomy was performed, either due to trauma or on other medical grounds, were included in this study. In 12 patients (40%), total of 16 (53%) complications were reported. Out of these 12 patients, 5 (17%) were operated for medical conditions and 7 patients (23%) were operated for trauma (Table 7). Out of 18 cases of splenectomy due to trauma, twelve cases were associated with other intra-abdominal injuries like liver and gut, while in six cases, only splenic injury was present (Table 5).

Subphrenic abscess occurred in 3 cases (19%) and according to 95% confidence interval estimation, this percent between 0.00% and 15.60% for all the

patients (Table 8). It accounts 19% of the total complications (Table 9). Out of these, in one case splenectomy was performed due to trauma while in two cases splenectomy was performed due to Hodgkin’s Lymphoma and idiopathic thrombocytopenic purpura. A case of traumatic spleen was associated with gut injury (Table 6).

Haemorrhage occurred in 4 cases (13.3%) and according to 95% confidence interval estimation, this percentage was present between 1.17% and 25.50% for all the patients (Table 8). It accounts 25% of the total 16 complications (Table 9). Out of these four patients, three were operated for trauma while one case was operated for hydatid cyst (table 6). Two cases were managed conservatively with blood transfusion and two cases were explored again.

Significant left basal atelectasis occurred in 5 cases (13.3%) and according to 95% confidence interval estimation, this percentage was present between 1.17% and 25.50% for all complications (Table 9). In one patient, splenectomy was performed for trauma (table 6). All patients responded well to physiotherapy.

Injury to the tail of pancreas occurred in 2 cases (6.7%) in present study and according to 95% confidence interval estimation, this percentage was present between 0.00% and 15.60% for all the patients (Table 8). It accounts 13% of the total 16 complications (Table 9). These patients were operated for trauma (Table 6). These were managed conservatively.

Thrombocytosis occurred in 3 cases (10%) and according to 95% confidence interval estimation, this percentage lies between 0.00% and 20.74% for all the patients (Table 8). It accounts 19% of the total 16 complications (Table 9). In all cases splenectomy was performed due to idiopathic thrombocytopenic purpura (Table 6). In two cases, platelet count was below 100000/µl and in one case it was above 1 million/µl. Prophylaxis against deep vein thrombosis was given to all patients. Luckily no embolic phenomenon occurred. Long term aspirin therapy was given to one patient on discharge whose platelet count was above one million/µl. this case was operated for idiopathic thrombocytopenic purpura.

Table 1: Age / sex distribution of patients

| Age in years | =n | Male | Female |
|--------------|----|------|--------|
| 1-10 | 4 | 4 | - |
| 11-20 | 2 | 2 | - |
| 21-30 | 7 | 7 | - |
| 31-40 | 6 | 2 | 4 |
| 41-50 | 6 | 1 | 5 |
| 51-60 | 5 | 4 | 1 |

Death occurred in 2 cases (6.7%) in this study. One patient was operated for Hodgkin's disease and one patient was operated for trauma. This patient was also having injuries to liver and large intestine. This patient died of complications not directly related to the splenectomy. In former case subphrenic abscess was the cause.

Table 2: Urban/rural distribution

| Urban | rural |
|-------|-------|
| 66.7 | 33.3 |

Table 3: Indications of splenectomy: trauma / medical conditions

| Indications | %age |
|-------------------------------------|------|
| Splenic trauma | 60 |
| Hodgkin's Lymphoma | 10 |
| Thalassemia | 7 |
| Idiopathic Thrombocytopenic purpura | 10 |
| Hyadated cyst | 10 |
| Hemolytic anemia | 3 |

Table 4: Complications after splenectomy

| Complications | =n |
|---------------------------|----|
| Basal atelectasis | 4 |
| Hwmorrhage | 4 |
| Subphrenic abscess | 3 |
| Damage to pancreatic tail | 2 |
| Thrombocytosis | 3 |

Table 5: Splenectomy in traumatic patients

| Indications | =n | %age |
|---|----|------|
| Splenic trauma alone | 6 | 33 |
| Splenic trauma associated with gut and liver injuries | 12 | 67 |

Table 6: Complications after splenectomy

| Complications | Traumatic patients | Splenectomy with other medical condition |
|------------------------|--------------------|--|
| Thrombocytosis | 1 | 2 |
| Haemorrhage | 3 | 1 |
| Left basal atelectasis | 3 | 1 |
| Pancreatic Injury | 2 | - |
| Thrombocytosis | - | 3 |

Table 7: Reasons for splenectomy

| Reasons | Total | Pt. with complications | Compli-cations |
|--------------------|-------|------------------------|----------------|
| Medical conditions | 12 | 5(16.67%) | 7(43.75%) |
| Trauma | 18 | 7(23.33%) | 9(56.25%) |

Percentage of patients with complications = 40%
According to 95% interval estimation, this percentage will lie between 22.45% and 57.53% for all the patients.

Table 8: Proportion of complications in total patients

| Complications | %age | 95% CI for %age for all pts. |
|----------------------------|--------|------------------------------|
| Basal atelectasis | 133.33 | (01.17%, 25.50%) |
| Thrombocytosis | 10.00 | (0.00%, 20.74%) |
| Injury to tail of pancreas | 06.67 | (0.00%, 15.60%) |
| Subphrenic abscess | 10.00 | (0.00%, 20.74%) |
| Hemorrhage | 13.33 | (01.17%, 25.50%) |

CI=Confidence interval

Table 9: Complication percentages in total complication

| Complications | %age |
|--------------------|------|
| Haemorrhage | 24 |
| Basal atelectasis | 25 |
| Subphrenic abscess | 19 |
| Thrombocytosis | 19 |

DISCUSSION

Overall incidence of complications after splenectomy is difficult to determine because it varies with different diseases of spleen. Deficient immunological defense mechanism may be a significant factor in the development of early complications in the patients after splenectomy.

In present study, 5 out of 12 patients (41.7%), who underwent splenectomy for medical diseases developed complications. A study performed by Petrovic M, Popovic M, Knezevic S, Matic S, Gotic M, Milovanovic A et al, the postoperative complications rate was higher when performed for medical diseases¹¹. This is comparable to present study. Other study was done by Khan AFA, Gondal KM, Ali AA, the complication rate was 30% in 28 patients who underwent splenectomy for various medical diseases¹². This is less as compared to present study. It may be due to less number of cases and good postoperative care after operation in that study.

In this study, 12 patients (40%) developed complications. A study done by Juvara I, Dragomirescu C, Priscu A, 68 out of 200 patients (34%) developed complications¹³. In another study, the complications rate was 27%¹¹. Thus complications rate in this study is slightly higher than above two studies. This slight difference may be due to less number of cases in this study and due to the reason that in emergency setup 18 out of 30 splenectomies (60%) were performed by relatively inexperienced surgeons.

In present study, basal atelectasis occurred in 4 cases (11.3%). In a study 19 out of 200 cases (9.5%) developed pulmonary complications¹³. Thus the rate of basal atelectasis is higher in present study which may be attributed to relatively poor nursing care in our setup. Another study carried out by Majid A, Zahra F, Waheed M, Manan J, the respiratory

infection rate was the problem in 9 out of 14 patients (64%)¹⁴. It is higher as compared to present study. It might be due to less number of cases and study was performed in only one disease.

In present study, thrombocytosis occurred in 3 cases (10%). In another study, 20 out of 200 cases (10%) suffered from thrombocytosis¹³. It is comparable to the present study. Another study performed by Canonico S, Sciaudone G, Santoriello A, Campitiello F, Ciarleglio FA, Lovine F, et al, showed the co-relation between persistent thrombocytosis after splenectomy as causative factor of thrombocytosis¹⁵. This study indicates that splenectomy contributes to abnormal platelet aggregation and endothelial cell activation with hypercoagulability. After splenectomy there is increased number of thrombocytes which might lead to thromboembolic complications in the postoperative period. Prolong antiaggregation therapy is suggested.

In present study, injury to tail of pancreas occurred in 2 cases (6.7%). In a study, this complication occurred in 5 out of 200 cases (2.5%)¹³. Thus this complication in present study is higher. This may be due to splenectomy performed by relative inexperienced surgeons in emergency setup.

In this study, subphrenic abscess developed in 3 out of 30 cases (10%). In a study, the septic complications occurred in 20 out of 200 cases (11%)¹³. Thus the septic complication rate is almost similar with the above study. In another study by Shantney CH, the septic complications were also one of the common complications after splenectomy¹⁶. It is worth noting that septic complication rate after splenectomy is higher when there are associated gut injuries.

In this study, haemorrhage occurred in 4 cases (13.3%). In all these cases splenectomy was performed for medical conditions. In these cases spleen was massively enlarged. In 2 cases, haemorrhage was mild and managed conservatively by blood transfusion. While in other two case, exploration was done for the management of significant bleeding. Bleeding was occurring from the raw surface of diaphragm due to adhesions formation between massive spleen and surrounding. Of these two patients, one died. Thus massive splenomegaly increased the risk of postoperative complications. Same conclusions was inferred by the study performed by Arnoltti JP, Karam j and Brodsky J in Philadelphia USA¹⁷. It was 7.1% in another study¹⁴.

In this study, 2 out of 30 cases (6.7%) died. A study performed by MacRae MH, Yakimets WW, Reynolds T, the death rate was 5 % (7 out of 142 patients)¹⁸. In a study carried out by Ziemski JM, Rudowski WJ, Jaskowiak W, Rusiniak L, Scharf R, the mortality rate was 4.7%¹⁹. In another study, it was

4%¹³. So mortality rate in present study is higher than the above two studies. It might be due to less number of cases included in present study.

REFERENCES

1. Boulanger BR, McLellan BA, Breneman FD et al: Emergent abdominal sonography as a screening test in a new diagnostically algorithm for blunt trauma. *J Trauma* 1996; 40: 867-74.
2. Upadhyaya P, conservative management of splenic trauma: History and \current Trends, *Pediatr Surg Int* 2003;19:617-627.
3. Patcher HL, Grau J. Current status of splenic preservation. *Advances in surgery* 2000; 34:137-174.
4. Mooney DP. Multiple trauma: liver and spleen injury. *Current Op Ped* 2002;14:428-485.
5. Hugo T.C. Vager, Gerrolt n Jukema and Paul J. Bode: Paediatric Splenic Injurry Non operative management first. *European Journal of trauma and emergency surgery* 2008; 34:267-272.
6. Cooper MJ, Williamson RCN. Splenectomy indications, hazards and alternatives *BJ Surgery* 1984;71:173-80.
7. Muhammad G, Ahmad S. Indications, hazards and alternatives. *J Ayub Med Coll Abbotabad* 1988;1:34-9.
8. Memon AA, Ansari AG, Memon AQ. Indication for splenectomy and challenging concepts. *J Surg Pakistan* 2000;5:7-9.
9. Javed NQ, Zahid AQ, Parkash A, Abdul SM. Gunshot perforation of gut and associated injuries. *J Surg Pakistan* 2001;6:21-3.
10. Ayub H. Assessment of blunt abdominal trauma. *J Ayub Med Coll Abbotabad* 1997;9:27-8.
11. Petrovic A, Popovic M, Knezevic S, Matic S, Gotic M, Milovanovic A, et al. Intraoperative and postoperative complications of splenectomy. *Acta Chir Lugosl* 2002; 49:81-4.
12. Khan AFA, Gondal KM, Ali AA. Experience of splenectomy for various Medical Disorders. *Ann KE Med Coll* 1997; 2:4-5.
13. Juvara I, Dragmirescu C, Priscu A. Complications of splenectomy. *Rev Chir Oncol Radiol ORL Oftalmol Stomatol Chir.* 1975; 24: 241-8.
14. Majid A, Zahra F, Waheed M, Manan J. Experience of splenectomy in Thalassemia. *Ann KE Med Coll* 2004; 10: 66-7.
15. Canonico S, Sciaudone G, Santoriello A, Campitiello F, Ciarleglio FA, lovine F, et al. Blood coagulation changes in patients with post splenectomy persistent thrombocytosis. *Chir Ital* 2001; 53: 537-42.
16. Shantney CH. Complications of splenectomy. *Acta Anaesthesiol Belg* 1987; 38: 333-9.
17. Arnoletti JP, Karam J Brodsky J. Early postoperative complications of splenectomy for hematologic disease. *Am J Clin Oncol* 1999; 22: 114-8.
18. MacRae MH, Yakimets WW, Reynolds T. Perioperative complications of splenectomy for hematologic disease. *Can J Surg* 1992; 35: 432-6.
19. Ziemski JM, Rudowski WJ, Jaskowiak W, Rusiniak L, Scharf R. Evaluation of early postoperative complications. *Surg Gynecol Obstet* 1987; 165: 507-14

