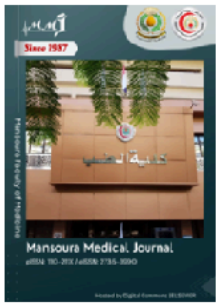
MANSOURA MEDICAL JOURNAL

ISSN - Print: 1110-211X - Online: 2735-3990

journal homepage: mmj.mans.edu.eg



Volume 30 | Issue 2 Article 1

POSTSPLENECTOMY PULMONARY RESECTION : RISK FACTORS FOR AN AVOIDABLE COMPLICATION

Ahmed Kadry Abdalta

Department of Cardio-Thoradc Surgery, Faculty of Medicine, Mansoura University, Mansoura, Egypt.

POSTSPLENECTOMY PULMONARY RESECTION : RISK FACTORS FOR AN AVOIDABLE COMPLICATION

By

Ahmed Kadry Abdalla, M.D.

From

Department of Cardio-Thoracic Surgery, Faculty of Medicine, Mansoura University, Mansoura, Egypt.

ABSTRACT

In our locality, splenectomy is frequently done for bilharziasis and its complications. It can be done as isolated operation or in conjunction with devascularization. Over a period of 20 years ending in December 2000, fifty-three patients were submitted for left pulmonary resections due to postsplenectomy complications in the Departement of Cardio-Thoracic Surgery at Mansoura University Hospitals. Thirty-two patients (60.4%) were males and 21 (39.6%) were females. Their ages range from 18 to 46 years (mean 34.9 ± 6.5 years).

Splenectomy was done for all patients because of bilharziasis. All patients had postsplenectomy subpherenic collection and in 42 of them (79.2%) the abscess was improperly managed. The elapsed time between splenectomy and start of respiratory symptoms ranged from 9 months to 13 years (mean 4.8 ± 2.9 years). The main respiratory presentations were productive cough with occasional hemoptysis that occurred in 23 patients (43.4%), suppurative syndrome in 18 (34%), and recurrent hemoptysis in 12 patients (22.6%). Radiological examination revealed bronchiectatic changed affecting the left lower lobe in 34 patients (64.2%) for whome lobectomy was done. The left lower lobe with the lingulae were affected in 19 patients (35.8%), 18 of them underwent lower lobectomy and lingulectomy, and in one patient left pneumonectomy was done because of massive vascular adhesions and accidental pulmonary vascular injury. Foreign bodies were found in 20 cases (37.7%) in the form of abdominal towels in 2, corrugated rubber drain in

Splenectomy is an operation with significant postoperative complications. Respiratory complications affect 10% to 48% of patients after open splenectomy in the form of atelectasis in 15%, pleural effusion in 11%, and pneumonia in 7-13% (4). Other complications include subpherenic abscess in 4-8% (5,6), wound problems in 3-6% (7,8), ileus and small bowel obstruction in 1-10% (8), fever (4), thromboembolism in 2-11% (4,6), splenosis in 48-66% (9), and overwhelming postsplenectomy infection in 4% (10). Laparoscopic splenectomy almost has the same complications (11).

One of the late complications of splenectomy is the neglected prolonged infection in the subpherenic space, which spread superiorly leading to bronchiectatic changes and destruction of the left lower lobe. As far as we know no previous studies discussed this problem except one report from our department published in the last decade (12). The aim of this study is to review the results of our experience with postsplenectomy pulmonary resection. In addition a comparative study was done between patients and control group in a trial to reveal the risk factors of developing this problem and how to avoid it.

PATIENTS AND METHODS

Over a period of 20 years ending in December 2000, 53 patients underwent left lung resection for destroyed lung tissue as a late complication of splenectomy in the Department of Cardio-Thoracic Surgery at Mansoura University Hospitals. Thirty-two patients were males and 21 were females. Their ages range from 18 to 46 years (mean 34.9 ± 6.5 years).

All patients had previous splenectomy and all of them had postsplenectomy subpherenic collection and recurrent attacks of fever. The elapsed time between the operation and start of the respiratory symptoms was ranging from 9 months to 13 years (mean 4.8 ± 2.9 years).

All patients were submitted for carful history taking regarding the previous splenectomy, postoperative fever and methods of drainage of subpherenic collection if already done. Full chest examination and preoperative investigations necessary for diagnosis of the chest problem were done. Bronchoscopy was done as a routine for all patients to exclude other causes of bronchiectasis or lobar collapse.

nectomy complications over the last 20 years ending in December 2000. Thirty-two patients (60.4%) were males and 21 (39.6%) were females. Their ages range from 18 to 46 years (mean 34.9 ± 6.5 years).

All patients developed respiratory symptoms after an elapsed period ranging from 9 months to 13 years (mean 4.8 ± 2.9 years) after splenectomy. Respiratory symptoms include productive cough with occasional hemoptysis in 23 patients (43.4%), suppurative syndrome in 18 (34%), and hemoptysis in 12 (22.6%). The lapse period between beginning of respiratory symptoms and referral for thoracic surgery ranged from 3 months to 2 years (mean 10 ± 3.1 months).

Chest x-rays in the form of posteroanterior and left lateral views were done for all patients, bronchography was done for 21 of the early cases in this study, and CT scan was done for 32 cases. Radiological examination of the chest revealed in addition to bronchiectatic changes (Fig 1&2) which was present in all patients, abscess cavities in 3 patients (5.7%), and chronic lung collapse in 15 (28.3%).

Abdominal ultrasound was done for all patients and revealed amalgamation of the subpherenic space in 38 patients (71.7%), and subpherenic abscess (Fig. 3) in 15 patients (28.3%). Associated colonic fistula was present in 3 patients (5.7%), gastric fistula in one (1.9%) as proved by contrast studies. Barium studies proved the presence of ccolonic fistula in 3 (5.7%) of our patiens, and gastric fistula in one (1.9%)

Sinogram was done for 7 patients (13.2%) who presented with abdominal wall sinus and revealed the presence of communication between the subpherenic space and bronchial tree of the left lower lobe in 3 patients (Fig 4), while demonstrated the presence of subpherenic abscess in 4 patients .

In 34 patients (64.2%) the bronchiectatic changes affected the left lower lobe and required left lower lobectomy, and the lingula was affected with the lower lobe in 19 patients (35.8%) who underwent left lower lobectomy and lingulectomy except one. Only in one patient (1.9%) the plane was to resect the bronchiectatic left lower lobe and lingulae but because of massive adhesions and pulmonary vascular injury the decision

Table 1. Complications of postsplenectomy pulmonary resection.

Complication	Number (15)	Percent (28.3%)
Intraoperative bleeding	4	7.5%
Pulmonary vascular injury	1	1.9%
Rethoracotomy for bleeding	2	3.8%
Hematemesis	1	1.9%
Empyema	2	3.8%
Wound infection	5	9.4%

Table 2. Comparative study between patients and control.

Factor	Patients (N=53)	Control (N=53)	P-value
Mean age (years)	34.9 ± 6.5	34.3 ± 4.5	N.S.
Sex (male to female ratio)	32/21	33/20	N.S.
Indication of splenectomy (hypersplenism/devascularization)	46/7	44/9	N.S.
Mean time from operation (years)	4.8 ± 2.9	4.9 ± 2.6	N.S.
Postsplenectomy subpherenic abscess (prolonged fever)	53 (100%)	6 (11.3%)	0.00001
Delayed drainage of the abscess	42 (79.2%)	0 (0%)	0.0002
Operating place (peripheral small clinic)	32 (60.4%)	10 (18.9%)	0.001

N: Number of patients, $P < 0.05$ considered significant.
NS: Nonsignificant.

DISCUSSION

Pleural effusions often occur in response to sterile or infectious inflammation below the diaphragm (13). Postsplenectomy subpherenic abscess result from a bacterial infection below the diaphragm, but the symptomatic pleural effusion is usually sterile. The effusion becomes a thoracic empyema in only 15 to 20% of patients and is then secondary to necrosis of the diaphragm (14). Many cases with these early postsplenectomy complications were treated in our Department either by thoracocentesis or thoracostomy tube drainage with underwater seal. To avoid contamination of the pleural cavity the chest should not be entered during surgical drainage of the intraabdominal collection, and if tube thoracotomy is necessary to control the effusion, it should be placed some distance from the abdominal incision.

In this study we are presenting the problem of late postsplenectomy left lung bronchiectasis requiring left pulmonary resection. Some of the general surgeons, who did splenectomy, are not aware about this complication because patients lose contact with them by time. Moreover, most of these patients were referred to our Department from the chest physicians because of their chest problem.

Most of the authors described the early postoperativr pulmonary complications in the form of left lower lobe atelectasis and pneumonia (4). Moreover, most of those who discussed the late infection after splenectomy, concentrated their work on children who had splenectomy done for hematological disease or trauma and atributed the late infection to the underdeveloped immune mechanism. Many studies have attempted to define the immunologic role of the spleen. It is apparent that the spleen is the major site of early IgM production and is important in the production of opsonins, particularly properdin. Asplenic patients have been found to have abnormalities of cell-mediated immunity as well (15). The reported incidence of severe late postsplenectomy infection varies considerably in the literature (16,17). Also differences exist as to what constitutes late postsplenectomy infection: miliary tuberculosis (18), osteomyelitis, rheumatic fever, respiratory tract infections (19), peritonitis (20), late wound infections (21), intraabdominal abscesses, Herpes zoster (21), and pyrexia of unknown origin (23) have been included.

drainage of the subpherenic space actually increases the incidence of subpherenic abscess (28).

Splenectomy performed as a single elective intraabdominal procedure should be followed by a very low incidence of subpherenic abscess of about 1% (29). If a subpherenic abscess developed the diagnosis should be suspected when there are signs and symptoms of inflammatory process in addition to tenderness either anteriorly or over the last rib posteriorly with elevation of the left hemidiaphragm in chest x-ray. Abdominal ultrasound has been the most valuable technique for early diagnosis of subpherenic abscess. CT scan of the abdomen could be done to confirm the diagnosis.

Once the diagnosis of subpherenic abscess is confirmed, the treatment is drainage. Approaches to drain the abscess include the posterior approach through the bed of the twelfth rib, lateral extraperitoneal approach, or anterior transabdominal approach. The decision concerning the proper approach depends on the localization site of the abscess cavity. In our series there was a reluctancy to drain the subpherenic abscess early in 34 patients (64.2%), in whom there were no scars of previous drainage. Moreover, although there were abdominal scars of previous drainage of the abscess in 19 patients (35.8%), the sequelae of the abscess continued which may be attributed to the insufficient drainage and/or the presence of infected foreign body.

Abdominal ultrasound was done to all patients in this study and showed either loculated subpherenic collection with very thick wall in 28.3% or organized amalgamated subpherenic area in 71.7% which again assures the reluctance in early drainage of the subpherenic abscess or its insufficient drainage.

Another problem of delayed insufficient drainage of the subpherenic abscess is erosion of the adjacent structures with fistulae formation. Postsplenectomy abscess leading to gasrtic perforation has been reported (30,31). Barium studies proved the presence of colonic fistula in 3 (5.7%) of our patiens, and gastric fistula in one (1.9%).

Pulmonary resection after splenectomy is a difficult surgery due to the extensive vascular adhesions to the

York; Springer.

2- **Reiman RS (1997) :** Pathology of the spleen. In; Hiatt JR, Phillips EH, Morgenstern L, eds. Surgical Diseases of the spleen. New York; Springer.

3- **Sadek AE (1976) :** Surgical aspects of gastrointestinal schistosomiasis. In compiled review on schistosomiasis (bilharaziasis). Report from the Academy of Scientific Research and Technology, Medical Research Council. Published by the National Information and Documentation Centre (NIDOC), Dokki, Cairo, Egypt.

4- **Ellison EC, Fabri PJ (1983) :** Coplications of splenectomy: Etiology, prevention and management. Surg Clin N Am 1983; 63: 1313-1330.

5- **Horowitz J, Smith JL, Weber TK, Rodriguez-Bigas MA, Petrelli NJ (1996) :** Postoperative complications after splenectomy for hematologic malignancies. Ann Surg ; 223: 290-296.

6- **MacRae HM, Yakimets WW, Reynolds T (1992) :** Perioperative complications of splenectomy for hematologic disease. Can J Surg; 35:432-436.

7- **Musser G, Lazar G, Hocking W, Busuttil RW (1984) :** Splenectomy for hematologic disease: The UCLA experience with 306 patients. Ann Surg; 200: 40-45.

8- **Jockovich M, Mendenhall NP, Sombeck MD, Talbert JL, Copeland EM III, Bland KI (1994) :** Long-term complications of laparotomy in Hodgkin's disease. Ann Surg; 219: 615-624.

9- **Mintz SJ, Petersen SR, Cheson B, Cordell LJ, Richards RC (1981) :** Splenectomy for immune thrombocytopenic purpura. Arch Surg; 116: 645-650.

10- **Shaw JHF, Print CG (1989) :** Postsplenectomy sepsis. Br J Surg; 76: 1074-1081.

11- **De Lagausie P, Rolich P, Ben-**

22- **Green JB, Shackford SR, Sise MJ, Fridlund P (1986) :** Late septic complications in adults following splenectomy for trauma: A prospective analysis in 144 patients> J Trauma; 26: 999-1004.

23- **Carlstedt A, Tholin B (1984) :** Infectious complications after splenectomy. Acts Chir Scand; 150:607-610.

24- **Haller JA Jr (1980) :** A new philosophy of pediatric surgery: Save our spleens. Surg Rounds; 16: 23-29.

25- **Weinstein ME, Govin GC, Rice CL, et al (1979) :** Splenorrhaphy for splenic trauma. J Trauma; 19: 692-698.

26- **Myers JG, Dent DL, Stewart RM, et al (2000) :** Blunt splenic injuries: Dedicated trauma surgeons can achieve a high rate of nonoperative success in patients of all ages. J Trauma; 48: 801-805.

27- **Slate RW, Getzen LC, Laning RC (1969) :** One hundred cases of traumatic rupture of the spleen. Arch Surg; 99:498.

28- **Olsen WR, Beaudoin DE (1969) :** Wound drainage after splenectomy: Indications and complications. Am J Surg; 117: 615.

29- **DeCosse NJ, Poulin TL, Fox PS, Condon RE (1974) :** Subpherenic abscess. Surg Gynecol Obstet; 138: 841-848.

30- **Oestreich AE (1978) :** Postsplenectomy abscess leading to acute gastric hemorrhage. Gastrointestinal Radiol; 3: 157-159.

31- **Martinez CA, Waisberg J, Palma RT, Bromberg SH, Castro MA, Santos PA (2000) :** Gastric necrosis and perforation as a complication of splenectomy. Case report and related references. Arq Gastroenterol; 37: 227-230.

صديدى فى مريضين وإلتهابات بجرح العملية فى ٥ مرضى .

وتم مقارنة هؤلاء المرضى مع مجموعة مماثلة ممن أجريت لهم عمليات إستئصال الطحال مسبقاً ولم يصابوا بمشاكل رئوية للوقوف على أسباب تفاقم الحالة إلى حد الحاجة للإستئصالات الرئوية .

وأظهرت المقارنة أن إجراء إستئصال الطحال فى مستشفى فرعى وظهور التقيح تحت الحجاب الحاجز بعد العملية. والتأخر أو عدم تصريف هذا التقيح على وجه السرعة كانت من أهم الأسباب التى تؤدى إلى ظهور هذه المشكلة حيث كانت هذه الأسباب ذات دلالات إحصائية مهمة .

ونستخلص من البحث أن عمليات الاستئصال الرئوية بسبب المضاعفات المتأخرة بعد عمليات إستئصال الطحال هى عمليات صعبة وترتبط بنسبة غير قليلة من المضاعفات والوفيات. ويمكن تجنب هذه المشكلة بمراعاة الدقة عند إجراء عملية إستئصال الطحال وتوقع حدوث التقيحات تحت الحجاب الحاجز بعد هذه العملية وتصريف هذا التقيح أن حدث على وجه السرعة.