

Pulmonary Resections - Jammu Experience

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Abstract

Ten year registry of patients who underwent pulmonary resections at CTVS section of Govt Medical College Jammu is being presented. The cohort consisted of 94 patients operated between 1994-2004. Males outnumbered females in this series. Most number (30/94) of patients presented in the 4th decade. Etiology wise, Infective lung diseases were the leading causes leading to pulmonary resections, this included bronchiectasis with 32/94, chronic empyema in 6/94 and middle lobe syndrome in one patient. Lung tumors were the causative factors in 20 and post tuberculosis destroyed lung in 17 cases. Two patients presented with intralobar lung sequestrations and one each with pulmonary blastoma and teratoma. The spectrum of resections included right pneumonectomy in 19/94 followed by right and left lower lobectomies in 18 each. Thirteen patients underwent left pneumonectomy, 7 bilobectomy and 4 lingulectomy respectively. The mortality in our series was 6/94, 20 patients had wound infection, 9 had bronchopleural fistula and 3 postoperative space infections. 3 patients were reexplored because of hemorrhage in immediate postoperative period. Diagnostic video assisted thoracoscopy has been started and was employed in 6 patients.

Key Words

Pulmonary Resection, Empyema, Bronchiectasis

Introduction

Riggins (1) remarked about inflammatory lung diseases as a state of chronic invalidism, psychological changes ranging from mild depressive state to psychopathic personality complete economic instability, a life alone apart, helpless and hopeless. Hence, pulmonary resections along with antibiotics were advocated. With the advent of anti-tubercular treatment in fifth decade, the surgery and post operative period became less problematic (2).

Material and Methods

The study includes 94 patients who underwent pulmonary resections in the CTVS unit of Govt. Medical College, Jammu over a period of 10 years w.e.f. 1994 to 2004. Hemogram, coagulation profile including the prothrombin time index, chest skigrams. CECT, sputum

examination, diagnostic bronchoscopy and pulmonary function tests were carried out. In recent 6 patients diagnostic video assisted thoracoscopy have been initiated. The spectrum of resections included right pneumonectomy in 19/94 (20%) followed by right and left lower lobectomies in 18 (19%) each 13 (14%) patients underwent left pneumonectomy, 7 (7.5%) bilobectomy 8/94(%) underwent left upper lobectomy 6/94 (7%) underwent right upper lobectomy and 4(4.4%) lingulectomy respectively.

Results

Males with 61/94 (65%) dominated the series females being 33/94 (35%). Maximum number of patients were in the age group of 31-40 years (31%). 7 year old boy was the youngest patient and 70 year lady was the oldest.

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Table 1. Age wise distribution

Age	No of patients	%age
< 10	6	7
11-20	10	11
21-30	24	26
31-40	30	31
41-50	15	16
51-60	03	3
>60	06	6

Aetiology wise, Infective lung diseases were the leading causes leading to pulmonary resections, this included Bronchiectasis with 32/94(34%), chronic empyema in 6/94 (7%) and middle lobe syndrome in one patient. Lung tumors were the causative factors in 20/94 (22%) and post tuberculosis destroyed lung in 17(18%) cases. 2 (2.12%) patients presented with intralobar lung sequestrations and one each with Pulmonary blastoma and teratoma

Table 2. Clinical Presentation

Bronchiectasis/Middle Lobe Syndrome	32/1
Malignancy	18
Pulmonary TB Destroyed lung	17
Bronchopleural Fistula	07
Chronic Empyema / Fibrosis	06/02
Fungal Ball	03
Benign Tumors Teratoma	02/01
Lung Abscess	02
Pulmonary Sequestrations	02
Pulmonary Blastoma	01

Table 3. Surgical Procedure

Name of Resection	No. of patients	%age
Right Pneumonectomy	19	20
Right lower lobectomy	18	19
Left Lower lobectomy	18	19
Left Pneumonectomy	13	14
Left upper lobectomy	08	09
Bilobectomy	07	7.5
Right upper lobectomy	06	6.5
Lingulectomy	04	04
Right Apical lobectomy	01	01

For preparing the patients for the procedure

In the procedure 66/94 (70%) of patients underwent anesthesia in form of single lumen endotracheal tube whereas in recently performed resections 28/94 (30%)

of patients double lumen endotracheal tube using the lung isolation technique was applied. 82/94 (87%) of patients underwent surgery through a standard posterolateral thoracotomy incision whereas in 12/94 (13%) of patients underwent muscle sparing lateral thoracotomy incision. Following pneumonectomies, drainage of pleural cavity was done using a single intercostal tube whereas in lobectomies pleural drainage was instituted using an apical and a basal intercostal tube respectively.

The mortality in our series was 6/94 (7%), 2 patients were lost in perioperative period because of exsanguinations following the procedure whereas the rest 4 (4.4%) succumbed in the post operative period 2 patients because of cardiac dysarrhythmia, one subsequent to pulmonary embolism and one because of septicemia, 9 (10%) of patients had bronchopleural fistula and out of them 6 (7%) had prolonged air leak through the intercostals tube ranging from 4th day till 4weeks which subsequently closed however in rest of the three patients the fistula persisted and in two of them completion pneumonectomy had to be done whereas in other a pleurocutaneous window was established 3 patients had postoperative space infections. That persisted upto 6months interval open drainage was instituted in two of them and appropriate antibiotic therapy after culture sensitivity of the pus was instituted and they responded to this, however one patient is still coming with persisting space infection, 3 patients were reexplored after the surgery because of hemorrhage in immediate post operative period, two out of three had bleeding bronchial vessels which were taken care of the other patient had diffuse oozing from all the surfaces with no active bleeder localization possibly due to coagulopathy and ultimately succumbed 20 patients had wound infection this included the patients with space infection as well as re-exploration. However, after treatment with appropriate antibiotics they responded well. Three patients presented with hemoptysis in follow-up they were investigated and found that bronchial stitch granulomas because of polypropylene sutures They were managed conservatively and responded however subsequently bronchial suturing was done using polyglycolic sutures.

Fig. 1 Pre-operative chest skigram showing right lower lobe opacity because of underlying intralobar pulmonary sequestration

Fig. 4 Preoperative chest skigram showing bronchiectasis involving the left lung

Fig. 2 Peroperative photograph of intralobar pulmonary sequestration



Fig. 3 Post operative chest skigram after excision of the right lower lobe. The intercostal chest tube is in place

Fig. 5 Post operative chest skigram of same patient after pneumonectomy. You can see the herniated right upper lobe

Discussion

Stevens *et al* (3) Presented retrospective study of the last 64 patients undergoing pneumonectomy. The underlying lung pathology was: destroyed lung due to tuberculosis in 33 patients; severe bronchiectasis in 25; necrotizing pneumonia in 4; lung abscess in 1 and hypoplastic lung in 1 patient. The perioperative management of these patients was outlined. Perioperative complications included respiratory failure in 4, secondary haemorrhage in 2 and post-pneumonectomy empyema in 5 patients. There were 2 mortalities (3.1%), both due to contralateral spillage with fulminant respiratory failure. Excellent results were achieved in 89% of the patients.

In our study, the overall mortality was 6 out of 94 and bronchopleural fistula which persisted in three patients. Excellent results were achieved in 90% of patients.

Conlan *et al* (4) presented a retrospective study of elective pneumonectomy for complicated inflammatory lung disease define modern-day mortality and morbidity. One hundred twenty-four patients received elective pneumonectomy. Patient ages ranged from 6 months to 71 years. Past, recurrent, or new pulmonary tuberculosis was present in 107 patients (86.3%). Clinical presentation involved recurrent infections or severe suppurative sequelae (abscess, empyema). Forty-seven patients had chronic hemoptysis and 25 patients had past or recent massive hemoptysis (> 600 ml of hemoptysis fluid within 24 hours). Nutritional deficiencies were common. One hundred six patients (85.5%) had end-stage destroyed lungs. Evaluative bronchoscopy showed inflammatory endobronchial changes in 106 patients (85.5%), bronchial strictures in 4, and indolent endobronchial tumor in 2. Lung separation was by double-lumen tube in 96 patients, single lung-single tube in 6, bronchus blocker in 6, and prone posture in 9. Extrapleural pneumonectomy was done in 83 patients (66.9%). Fifty-seven of these procedures were left sided and 26 were right sided. Standard transpleural pneumonectomy was done in 41 patients (33.1%): 30 left sided and 11 right sided. Nine pneumonectomies were conducted with the patient in the prone position. Four patients had completion pneumonectomy. Hospital mortality was three deaths (2.4%). Morbidity included postpneumonectomy empyema in 19 patients (15.3%). Seven postoperative bronchopleural fistulas occurred. Empyema in most patients was managed by open pleural drainage (thoracostoma) and later space closure. Pneumonectomy proved effective therapy with low mortality but postpneumonectomy empyema posed serious morbidity. In our study three patients had post pneumonectomy space infection two of them were treated by open drainage and responded however in other patient. It posed a serious morbidity.

Massard G *et al* (5) In there study of 112 patients who were reviewed for post operative morbidity and mortality and long term survival and compared the results of pneumonectomy with bilobectomy. These data demonstrate an increased morbidity after bilobectomy.

Kim *et al* (6) in their study of 20 years duration from 1981 to 2001 on 94 patients who underwent pneumonectomy for active and sequelae form of pulmonary tuberculosis analysed the morbidity, mortality and long term outcome. One patient died in immediate postoperative period, 23 complications occurred in 20 patients, empyema in 15 (bronchopleural fistula in 7), wound infection in 5 and other complications in 3 patients. There were 12 late deaths, actuarial 5 and 10 year survival rates were 94+3% and 87+4% respectively.

Stolz *et al* observed that COPD patients have significantly higher risk for PAL following pulmonary resection. Intraoperative prevention of the air leak requires meticulous surgical technique, stapler use and application of pericardial bovine strips (7).

Conclusion

Pulmonary resections could be performed with acceptable morbidity and mortality and could achieve satisfactory results. In patients with risk factors, special care is recommended to prevent empyema or bronchopleural fistula, that includes pulmonary function assessment, proper bronchial suturing techniques, prevention of bronchial spillage, using lung isolation technique, selective antibiotic coverage and chest physiotherapy. Use of video assisted thoracoscopy wherever available can compliment the existing procedures and reduce the morbidity and mortality further.

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