ORIGINAL ARTICLE

Pleurectomy for recurrent pneumothorax: an experience of 101 cases

Mohammad Abid Khan, Aamir Bilal, Viqar Aslam, Irum Batool, Mohammad Bilal, Mohammad Muslim, Farid, Manzoor Ahmed, Abdul baseer

Department of Thoracic Surgery, Lady Reading Hospital, Peshawar

---

OBJECTIVES:

Evaluation of pleurectomy for recurrent pneumothorax in terms of complications, recurrence rate.

METHODS:

Parietal pleurectomies from May 2004 to April 2007 for recurrent pneumothorax were analyzed. Patients under 10 years and over 60 years and patients with history of trauma or iatrogenic injury were excluded. All Patients that were admitted through emergency or out patients department were included.

RESULTS:

A total of 101 patients with spontaneous pneumothorax were studied. There were 64 (63.36%) male and 37 (36.63%) females, with a mean age of 34 years, range (14–77).Out of 101 patients 86 patients (85.14%) was in their 3rd and 4th decade of life, 4 patients (3.96%) in 2nd decade and 11 patients (10.8%) were in there 5th decade of life.

Out of 101 patients 63 patients (62.3%) were having tuberculosis, 23(22.7%) had COPD, 4 (3.96%) were post pneumonic while 11(10.8%) had primary spontaneous pneumothorax.

.

CONCLUSIONS:

Parietal pleurectomy is a simple, safe and effective method of the surgical treatment of recurrent pneumothorax in terms of complications and recurrence.

Key words:

Primary spontaneous pneumothorax (PSP), Secondary spontaneous pneumothorax (SSP). Video-assisted thoracoscopic surgery (VATS).Chronic obstructive airway disease (COPD)

INTRODUCTION:

Recurrent spontaneous pneumothorax is a disabling disorder. Spontaneous pneumothorax (SP) is divided into primary and secondary pneumothorax. Primary spontaneous pneumothorax (PSP) occurs after the rupture of a sub pleural bleb in otherwise normal lungs. Secondary spontaneous pneumothorax (SSP) occurs in the presence of underlying lung disease, usually emphysematous bullae .Primary spontaneous pneumothorax (PSP) is a relatively common disease but its pathophysiology remains unknown [1]. In most cases, no treatment is required other than thoracentesis or pleural drainage insertion. The recurrence rate after these treatments is considerably high; the international literature refers to a mean rate of relapse of ~30% after the first episode (range 16–52%) [2]. It is well accepted that, after the first episode, relapsing PSP requires a more invasive approach. Therapeutic options include chest drainage with instillation of pleural irritants, such as talc or tetracycline, medical thoracoscopy with talc instillation, complete pleurodesis through an open procedure and video-assisted thoracoscopic surgery (VATS) pleurodesis (mechanical pleural abrasion or apical pleurectomy[3]; both of these procedures may or may not be associated with apical lung wedge resection).The VATS procedure, though fairly straightforward, is not completely without morbidity[4]. Tube thoracostomy and instillation of pleural irritants showed a relapse rate of 8–25% medical thoracoscopy with talc instillation is reported to be associated with a 5% failure rate after a thorough follow-up over 5 yrs. the indications for surgical treatment in PSP are well defined[5]. Surgical intervention in the setting of SSP is associated with a much higher morbidity than it is in the setting of PSP[6] and has been conventionally considered only as a last resort[7]. In 1956, Gaensler[8] reported the first series of patients with recurrent spontaneous pneumothorax, in whom parietal pleurectomy was performed as a major therapeutic measure. The indication for thoracotomy is the same as for thracoscopy.if VATS is available thoracotomy is only recommended if thoracoscopy has failed. The reason for this recommendation is hospitalization is shorter and the post operative pain is less severe after thoracoscopy.However mini thoracotomy is still preferred the reason for preference is that time is saved because double lumen intubation is not required ,the operative time is short, there is good cosmetic result and is less expensive[9]. The goals of surgical intervention are to eliminate intrapleural air collection and prevent recurrence. The generally accepted indications for surgical intervention in pneumothorax are 1) recurrent ipsilateral pneumothorax, 2) first contra lateral pneumothorax, 3) bilateral simultaneous pneumothorax, 4) spontaneous hemopneumothorax. Surgical management aims at the resection of blebs or the suturing of pulmonary perforation and the creation of pleurodesis.

METHODS:

Parietal pleurectomies from May 2004 to April 2007 for recurrent pneumothorax were analyzed. Patients under 10 years and over 60 years and patients with history of trauma or iatrogenic injury were excluded.

All Patients that were admitted through emergency or out patients department were included .Initial chest x ray was done in all cases to develop a diagnosis and to estimate the extent and degree of pneumothorax. Computerized tomography was done in suspicious cases patients with minor pneumothorax <20% who are asymptomatic are treated conservatively but with careful observation .Symptomatic patients with larger pneumothorax were treated with tube thoracostomy. Patients were chemical pleurodesed after full lung expansion. Indications for surgery were recurrence, failure of full lung expansion and chemical pleurodesis. Preoperative investigations included pulmonary function tests, chest radiograph and a computed tomographic scan of the thorax in selected patients with emphysema. Surgical pleurodesis was carried out by parietal pleurectomy through a lateral thoracotomy the skin incision was not more than 15 cm in length. Most common abnormality was small bullas at the apex which were over sewn with fine suture material or ligated at the base. For multiple large bullas wedge resection of the pulmonary parenchyma at the base were accomplished. Parietal pleurectomy was performed in all cases. Cavity was drained by single F 32 tube through separate incision. Patients were extubated in the operating theatre and carried to the ward after 4–6 h of observation in the intermediate care unit. Daily chest radiography was carried out on each patient. The chest tube was usually removed when air leak had resolved, the lung had fully expanded and pleural drainage was <100 $mL \cdot 24\ h^{-1.}$

Patients were discharged one day after chest tube removal. After discharge, each patient was followed-up for a mean (range) period of 12 months; chest radiography and clinical observation were carried out at 2 ,4,6 weeks and than monthly .Demographic data ,factors responsible, surgical procedure, and outcome was recorded.

RESULTS:

A total of 101 patients with spontaneous pneumothorax were studied. There were 64 (63.36%) male and 37 (36.63%) females, with a mean age of 34 years, range 14–77). Out of 101, 86 (85.14%) patients was in their 3rd and 4th decade of life, 4 (3.96%) patients in 2nd decade and 11 (10.8%) patients were in there 5th decade of life (Table 1).
Out of 101, 63 (62.3%) were having tuberculosis 23(22.7%) had COPD 4 (3.96%) were post pneumonic while 11(10.8%) patients had primary spontaneous pneumothorax. (Table 2). Out of 101, 38 (37.62%) patients had pleurectomies combined with over sewing of the sub pleural blebs 49 (48.5%) patients had bullectomies while 14(13.86%) had combined approach (Table 3) The mean hospital stay was 7 days with range of 2 to 26 days .however 5 patients had longer stay exceeding 20 days due to associated co morbid conditions. The mean chest drain duration was 7.69± 1.6 days. Morbidity mortality is listed in (Table 4).

DISCUSSION:

Successful pneumothorax management should regard cause and extent of the air leak and must be directed towards elimination of the causative lesion, rapid and full expansion of the lung, minimal risk of recurrence, low or no morbidity and mortality, low cost and short hospital stay. Patients with spontaneous pneumothorax, which is usually caused by a rupture of a subpleural bleb or bulla in the underlying lung, most commonly present with ipsilateral sudden chest pain and dyspnea. The goals of pneumothorax treatment are to eliminate intrapleural air collection and to prevent recurrence. In the first episodes of spontaneous pneumothorax, observation, simple aspiration, or chest tube drainage in proportion to clinical stability or the degree of pneumothorax are recommended as first-line therapies[10, 11.]

Physicians and surgeons worldwide broadly agree that, at its first occurrence, PSP should be managed conservatively (ranging from observation to chest drain insertion), given that only 20–25% of patients experiences a recurrence[12]

Randomized clinical trials that have compared the clinical results of a VATS procedure to thoracotomy for spontaneous pneumothorax have shown that the VATS procedure was superior to thoracotomy with regard to postoperative pain, hospital stay, and pulmonary function [13]. VATS showed no advantage over thoracotomy with regard to the postoperative recurrence rate[14]. Based on previous retrospective reports, patients who underwent VATS seemed to be more likely to develop recurrence.

Postero-lateral thoracotomy is preferred than axillery thoracotomy as suggested by Kim et al.[14] in diffuse bullous disease because of reservation about the access offered and chronic wound pain by the latter approach. Furthermore, in a prospective, randomized comparison, Hazelrigg and associates [15] found no reduction in the postoperative respiratory dysfunction when a muscle sparing rather than the standard postero-lateral thoracotomy was used.

Any new treatment modality should compare at least equally well in terms of operative risk and long-term results to open thoracotomy, which has set the standard of excellence to be challenged. Classically, the timing of operative intervention should refer to the spontaneous potential of recurrence

CONCLUSIONS:

Parietal pleurectomy is a simple, safe and effective method of the surgical treatment of recurrent pneumothorax in terms of complications and recurrence rate

REFERENCES:

1. Tschopp JM, Rami-Porta R, Noppen M, Astoul P. Management of spontaneous pneumothorax: state of the art. Euro Respir J 2006; 28:637–50.

2. Schramel FM, Postmus PE, Vanderschueren RG. Current aspects of spontaneous pneumothorax. Eur Respir J 1997; 10:1372–79.

3. Hiroyuki Sakurai,Videothoracoscopic surgical approach for spontaneous pneumothorax: review of the pertinent literature. World Journal of Emergency Surgery 2008. 3:23: 7922-3

4. Mark k Ferguson. Difficult decisions in thoracic surgery an evidence base Approach, Springer Verlag London limited 2007

5. Parry GW, Juniper ME, Dussek JE. Surgical intervention in spontaneous pneumothorax. Respire Med 1992; 86:1–2.

6. Weeden D, Smith GH. Surgical experience in the management of spontaneous pneumothorax, 1972–82. Thorax 1983; 38:737–43.

7. Tanaka F, Itoh M, Esaki H, Isobe J, Ueno Y, Inoue R. Secondary spontaneous pneumothorax. Ann Thorac Surg 1993; 55:372–76.

8. Gaensler EA. Parietal pleurectomy for recurrent spontaneous pneumothorax. Surg Gynecol Obstet 1956; 102:293–308

9. Richard w. light, pleural disease**:** 2007; 427-428

10. Henry M, Arnold T, Harvey J: BTS guidelines for the management of spontaneous pneumothorax**.** *Thorax* 2003, 58**:**39-52.

11. Tschopp JM, Rami-Porta R, Noppen M, Astoul P: Management of spontaneous pneumothorax: state of the art**.** *Eur Respir J* 2006, 28**:**637-50

12. Baumann MH, Strange C, Heffner JE, et al. Management of spontaneous pneumothorax. An American College of Chest Physicians Delphi consensus statement. Chest 2001; 119:590–602.

13. Balduyck B, Hendriks J, Lauwers P, Schil PV: Quality of life evolution after surgery for primary or secondary spontaneous pneumothorax: a prospective study comparing different surgical techniques.Interact Cardiovasc Thorac Surg 2008,7:45-49

14. Kim KH, Kim HK, Han JY, Kim JT, Won YS, Choi SS: Transaxillary minithoracotomy versus video-assisted thoracic surgery for spontaneous pneumothorax.Ann Thorac Surg 1996, 61:1510-12

15. Hazelrigg SR, Lanreneau RJ, Boley TM, Priesmeyer M, Schmaltz RA, Nawarawong W, Johnson JA, Walls JT, Curtis JJ. The effect of muscle sparing versus standard postero-lateral thoracotomy on pulmonary function, muscle strength and post-operative pain. J Thorac Cardiovasc Surg 1991;101:394–401

Table 1

Incidence of spontaneous pneumothorax by age (n=101)

Age (years)	N=	% age
10-20	4	3.96%
21-30	20	19.80%
31-40	66	65.34%
41-60	11	10.80%

Table 2

Factors responsible (n=101)

Cause	N=	% age
Tuberculosis	63	62.3%%
Primary spontaneous	11	10.8%%
COPD	23	22.7%%
Post pneumonic	4	3.96%%

Table 3

Management of recurrent pneumothorax (n=101)

Procedure	N=	% age
Oversewing/ligation (sub pleural blebs)	38	37.62%
Bullectomy/wedge resection	49	48.5%

Pleurectomies combined	14	13.86%

Table 4

Morbidity mortality (n=101)

Complications	N=	% age
Haemothorax	2	1.980%
Empyema	1	0.99%%
Collapse	1	0.99%%
Mortality	1	0.99%%