

PNEUMOTHORAX — IS IT A DIFFERENT DISEASE IN THE EAST ?

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SUMMARY

A study was performed in chest unit of PGMI to evaluate the presentation, etiology and management of pneumothorax. 60 patients presented with pneumothorax over a period of 2 years and 6 months (M:F=2.5:1). The pneumothorax was due to Pulmonary Tuberculosis (PTB) in 32 cases, Chronic Obstructive Pulmonary Disease (COPD) in 14 cases, Interstitial Lung Disease (ILD) in 2 cases, Staphylococcus Aureus pneumonia with abscesses in 1 case, Iatrogenic pneumothorax in 1 case, blunt trauma to chest in 1 case and 9 cases had Primary Spontaneous Pneumothorax (PSP). In most of the cases the intercostal tube was removed in the first two weeks after the lungs were fully expanded. Eleven patients were referred to thoracic surgeon for pleurectomies while another two died. This study suggest that PTB and COPD are the more common causes of pneumothorax than PSP in our country contrary to the western literature.

INTRODUCTION

Pneumothorax is defined as the presence of air in the pleural cavity. This term was first described in the doctoral thesis of French physician Itard in 1803.¹ The presence of abnormal collection of air and fluid might have been detected by ancient Greek physician who practiced Hippocratic succussion of the chest.^{2,3} It is generally accepted that the commonest cause of pneumothorax is primary spontaneous pneumothorax (PSP).^{4,5}

We conducted this study with a purpose to evaluate the presentation and etiology of pneumothorax in our set up, and highlight the management options available, the complications we encountered and the way we dealt with these complications during the management of these patients and the eventual outcome.

MATERIAL AND METHODS

This prospective study was conducted in the Chest unit of Postgraduate Medical Institute Lady Reading Hospital, Peshawar from Jan. 1995 to June 1997. All the patients presenting with pneumothorax were admitted to the hospital. They were assessed clinically and radiologically, and after immediate emergency management detailed history and examination was conducted. All the patients were subjected to the following investigations, in order to determine the etiology of pneumothorax: Chest radiograph, full blood count with ESR, blood Urea, blood Sugar, sputum for AFB, and spirometry on day of discharge. Complete record of the management and complications was kept. Each patient was followed up at fortnightly interval for at least three months, to exclude the recurrence of pneumothorax or any other complication.

RESULTS

This prospective study included 60 cases 43 males (71.6%) and 17 females (28.4%) with the age range of 15–70 years. Male to female ratio was 2.5:1 (Table-I). The common presenting symptoms were chest pain 81.7% (49 cases) dyspnoea 98% (59 cases) low grade fever 66.6% (40 cases), and cough 81.7% (49 cases).

Pneumothorax was significantly more common on the right than the left side ($p < 0.05$) with 34 (56.7%) patients pneumothorax was on the right side, 23 (38.3%) on the left side and 3 (5%) bilateral. In 50% (30 cases) the pneumothorax was between 50 to 70% of the hemithorax radiologically, 33.3% (20 cases) had greater than 70% of the pneumothorax and 13.3% (8 cases) less than 50%. Two patients (3.3%) died, one due to infection and the other had advanced fibrosing alveolitis.

Etiologically 53.3% (32 cases) had PTB, 23.3% (14 cases) COPD, 15% (9 cases) PSP, 3.3% (2 cases) had ILD one patient (1.7%) had pneumothorax due to Staph. Aureus pneumonia, one patient (1.7%) had iatrogenic pneumothorax due to therapeutic fluid aspiration and another one case (1.7%) had pneumothorax due to blunt trauma to chest.

The PTB group included 32 patients, 17 males, 15 females, with the age range between 15–35 years. 17 had pneumothorax

on the right side, 14 on the left and one bilateral. All the patient were intubated. In 22 cases the tube was removed within 2 weeks time and in 2 cases the tube was removed in 3rd week after the lungs were fully expanded with no air leak. 5 patients had trapped lungs, two had broncho-pleural fistula. They were referred to thoracic surgeons for pleurectomy. One patient had chemical pleurodesis for recurrent pneumothorax (table-II).

The COPD group included 14 patients all males with the age range of 45–70 years. 6 patients had pneumothorax on left, 7 on the right ($p > 0.05$). One patient had bilateral pneumothorax. In 10 cases the tube was removed in the first week and in the remaining four the tube was removed in the second week. Their course was uncomplicated.

The PSP group included 9 cases 7 males and 2 females with the age range of 20–25 years. In 7 cases the tube was removed in first two weeks. 2 cases developed recurrent pneumothorax and were referred to thoracic surgeon for pleurectomy and were found to have multiple bullae in the apex of the left lung.

ILD group included two cases both females. One 30 years and the other 48 years of age with a pneumothorax on the left and right side respectively. Both the cases developed broncho-pleural fistula, one of them dying on the 28th day of admission and the other was referred to thoracic surgeon after 3 weeks of unsuccessful intubation (Table-II).

The 19 years old male with bilateral Pneumothorax secondary to Staphylococcal pneumonia expired on 24th day of admission. The 55 years old male with iatrogenic pneumothorax improved and tube was removed on day 5. While the 18 years old male with pneumothorax due to blunt trauma had the tube was removed on day 7.

TABLE - I

AGE AND SEX DISTRIBUTION

AGE RANGE	MALE	FEMALE
15-30 YEARS	22	14
31-50	8	2
31-70	13	1
TOTAL	43	17

TABLE - II
SPECTRUM OF LUNG DISEASES CAUSING PNEUMOTHORAX
AND THEIR OUTCOME

Cause	Total	M	F	Age	Side			Week of Extubation			Complication
					Rt	Lt	Bil	1st	2nd	3rd	
TB	32	17	15	15-35	17	14	1	4	18	2	Trapped lung(5) Br. Pleural fistula(2) Pleurodesis (1)
COPD	14	14	0	45-70	7	6	1	10	4	-	NIL
PSP	9	7	2	0-25	7	2	0	6	1	-	Pleurectomy(2)
ILD	2	0	2	30-48	1	1	0	-	-	0	Died(1) and Pleurectomy(1)
Infection	1	1	0	19	-	-	1	-	-	-	Died(1)
Iatrogenic	1	1	0	55	1	-	-	1	-	-	NIL
Accident (Blunt trauma)	1	1		18	1		1				NIL
TOTAL:	60	41	19		34	23	3	22	23	2	13

DISCUSSION

Pneumothorax is classified etiologically into primary spontaneous pneumothorax (PSP), secondary spontaneous pneumothorax (SSP) and traumatic pneumothorax.

In one study⁴ it was found that spontaneous pneumothorax was primary in 81% of cases at or below the age of 45 years. PSP is a disease of young adults the peak incidence is usually in the 3rd decade.^{4,6} The primary spontaneous pneumo-thorax predominantly occurs in males and the M:F ratio varying from 12:1(7) and 4:1⁸ in different studies. The right and left sides were affected equally.⁹

PSP results from rupture of pulmonary blebs which arise due to congenital weakness in the connective tissue of sub pleural alveoli. They are frequently multiple and occur at lung apices.¹⁰⁻¹³ This study shows that spontaneous pneumothorax

was primary in only 9 (15%) cases. All of them were males, young, tall and lean. We conclude that PSP is not the commonest cause of pneumothorax in our country but it does show a predilection for males with tall and thin body habitus.^{14,15,16}

Spontaneous pneumothorax occurring as a result of disease is categorized as secondary spontaneous pneumothorax. In developed countries chronic bronchitis and emphysema are the most frequent conditions accounting for 30% to 50% of cases.¹⁷ All these patients tend to be middle aged or elderly and emphysema is the commonest cause of pneumothorax above the age of 40.¹⁸

In the present study chronic bronchitis and emphysema were responsible for 23.3% of the cases of pneumothorax. All of them were middle aged or elderly males.

The major area of our study which is in contradiction with the literature from the developed countries is the association of PTB with spontaneous pneumothorax. Our study shows PTB as a cause of secondary spontaneous pneumothorax in 53% of cases. Most of these cases were young, with active cavitating PTB. Pneumothorax in these cases had complicated course and needed aggressive intervention.

We found that in our country secondary spontaneous pneumothorax specially due to underlying PTB and COPD is more common than PSP with PTB at the top.

Despite many surveys of management of spontaneous pneumothorax several questions remain unanswered and there are wide variations in the management.^{19,20} Initial management may become standardized following publication of British thoracic society guidelines.²¹ One of the major management problems is optimum time for surgical referral when the patient develops persistent air leak (PAL). PAL may be defined as a continued air leak at two days or more after tube insertion.³¹ Previous studies show that great majority of Spontaneous Pneumothorax in young had re-expanded by one to three days.²² The healing rate was 82% at 48 hours in another study of PSP.²³ Resolution rate in SSP has been quoted as 60% at 48 hours.²² In another study a median time of nine days for resolution has been quoted in COPD patients.²⁴

Our study shows that 75% of the patients receiving inter-costal tube drainage for spontaneous pneumothorax develop PAL. Almost all of those who had a PAL had SSP due to underlying disease.

In spontaneous pneumothorax (SP) secondary to COPD the resolution time was 7–10 days. In PTB and ILD the resolution time was longer. In SP secondary to PTB the resolution time was 7–14 days in 22 patients and 14–21 days in 2 patients. 5

patients had trapped lungs, two developed broncho-pleural fistula one had pleurodesis and were referred for surgery after 3 weeks of intubation. Both the patients with ILD developed broncho-pleural fistula one of them expired and the other had pleurectomy done after 3 weeks of intubation.

There is considerable debate about the timing of surgical intervention. The more conventional recommendation had been to wait until 7–10 days after tube insertion.^{24–28} Though Harvey et al recommended very early surgery for a large air leak a recommendation doubted by others.²⁵ Some authors have advocated a more aggressive approach of intervention at 2–3 days.^{24,30,31}

Our study would indicate that in the majority of patients (75%) the pneumothorax resolved within 2 weeks of intubation. If pneumothorax does not resolve in two weeks time then surgical intervention is recommended. Clearly however such recommendation must take into account a number of other factors including fitness for surgery, surgical morbidity and mortality, the recurrence rate, financial cost both to the patients and health services and the availability of thoracic surgeon.

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