



## Surgery

## PRE AND POST OPERATIVE ASSESSMENT OF PULMONARY FUNCTION AFTER THREE DIFFERENT SURGICAL MODALITIES.

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**ABSTRACT** 1.**Aim** - To evaluate the effect of three different operative procedure in P.F.T and to determine and compare the pre-operative and post-operative value of P.F.T. in patient between the various age group for thoracic surgery.  
 2.**Materials and methods** - The study was undertaken in the department of Cardiothoracic surgery, Hamidia Hospital, Bhopal (M.P.). The basis of selection for pulmonary Function test in thoracic surgery is on clinical ground, ski-gram, USG, Histopathology, CT scan. Patient of all ages and both sexes were included. A three way anova analysis along with student t test was applied.  
 3.**Results** - Decortication showed significant improvement in pulmonary function test compared to pneumonectomy or excision of cyst.  
 4.**Conclusion** - Pre-operative assessment of patient by PFT plays major role in inter-operative management and post operative outcome. Comparison of pre and post operative PFT values reveals significant improvement post operatively as compare to pre-operating values.

### KEYWORDS :

#### Introduction

The study of Pulmonary Function Testing has assumed considerable importance since the development of Thoracic Surgery. In the past two decade, a large number of physiological test have been developed for the qualitative as well as quantitative evaluation of pulmonary function in patient with suspected abnormalities of pulmonary system<sup>1,2</sup>. Patient, who are about to undergo surgery, such as for collapse therapy or resection of the lung tissue required truly quantitative evaluation of their function, so that some prognosis may be given as to the immediate hazards of surgery. However there are certain limitations of these tests, they cannot reveal pulmonary disease unless the function is sufficiently impaired. Pre-operative Pulmonary function test has been felt important since early surgical observation showed that pulmonary complication were the most frequent cause of morbidity and mortality in post-operative period.

Recent studies<sup>3,4,5,6,7,8</sup> that have included the determination of post-operative length of stay in the intensive care unit of hospital have been helpful in the assessing whether specific intervention are useful in decreasing pulmonary complication because significant pulmonary complication invariably prolong length of stay. Intensive respiratory therapy can be offered in pre and post operative period that attempts to diminished the magnitude of the risk and allow acceptable safe surgery in case where pre-operative pulmonary function testing reveals abnormal results.

#### Materials and methods

- The study was undertaken in the department of Cardiothoracic surgery, Hamidia Hospital, Bhopal. The basis of selection for pulmonary Function test in thoracic surgery is on clinical ground, ski-gram, USG, Histopathology and CT scan. Patient of all ages and both sexes were included only after full investigation and after making full diagnosis. In physical examination the general examination of the patient was done along with local examination also general systemic examination were done to rule out any associated systemic disease. Three way anova and student t test were applied.
- In the Present study four parameters were used, which were measured by Spirometry:-
  - FVC - FORCED VITAL CAPACITY
  - FEV 1 SEC FORCED EXPIRATORY VOLUME IN ONE SECOND.
  - FVC/FEV 1% FVC/FEV 1 SEC PERCENTAGE
  - FEF 25%-75% FORCED EXPIRATORY FLOW 25%- 75% AT THE MIDDLE OF THE EXPIRATON.

#### Results

Results showed that maximum number of cases i.e. 14(28%) were of age group 21-30 years and minimum no. of cases were of age group of 61-70 (table 1). Also, propensity of pulmonary disease is more amongst male as compared to females (Graph 1). Amongst the different pulmonary diseases maximum number of cases found to be of Pyothorax (40) followed by lung mass cyst and destroyed lung respectively (table 2) for which the surgical Decortication performed

were higher in number compared to Pneumonectomy and Excision mass cyst (table 3).after surgery the maximum improvement in pulmonary function test was showed by Decortication with FVC increase of 8.02% compared to 2.93% and 2.58% of excision of mass cyst and Pneumonectomy respectively, also, FEF25%-75% rise is highest for decortications with 9.56% after seven days compared to other modalities(table 4).

TABLE NO.1 SHOWING AGE DISTRIBUTION OF CASES

AGE GROUP	NO. OF CASES	% OF CASES
0-10 yrs	04	08
11-20 yrs	11	22
21-30 yrs	14	28
31-40 yrs	08	16
41-50 yrs	05	10
51-60 yrs	06	12
61-70 yrs	02	4

Graph 1 Showing sex distribution of cases

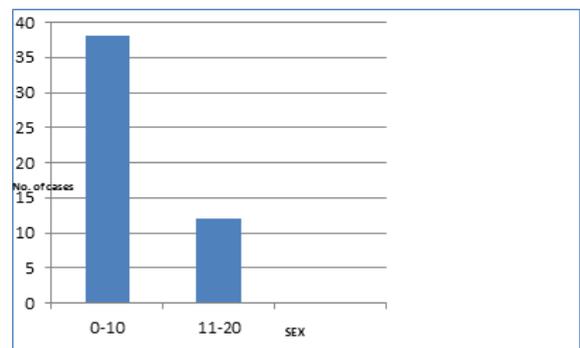


TABLE NO. 2 SHOWING DISTRIBUTION OF VARIOUS PULMONARY DISEASES

S NO.	PULMONARY DISEASES	TOTAL NO. OF CASES	% OF CASES
1.	PYOTHRAX	40	80
2.	LING MASS/CYST	05	10
3.	DESTROYED LUNG	05	10

TABLE NO. 3 SHOWING VARIOUS PULMONARY SURGICAL PROCEDURE

S NO.	TYPE OF OPERATION	MALE	FEMALE	TOTAL NO. OF CASES	%
1.	DECORTICATION	31	09	40	80
2.	PNEUMONECTOMY	03	02	05	10
3.	EXCISION OF MASS/ CYST	04	01	05	10

**Table 4 Comparative evaluation of different surgical procedure and their outcome:**

S. NO	PFT	Excision of Cyst					Pneumonectomy					Decortiation				
		Pre-op.	4 <sup>th</sup> POD	% decrease on 4 <sup>th</sup> POD	7 <sup>th</sup> POD	% increase	Pre-op.	4 <sup>th</sup> POD	% decrease on 4 <sup>th</sup> POD	7 <sup>th</sup> POD	% increase	Pre-op.	4 <sup>th</sup> POD	% decrease on 4 <sup>th</sup> POD	7 <sup>th</sup> POD	% increase
1	FVC	2.72	2.59	4.70	2.80	2.93	1.54	1.40	3.31	1.56	1.55	1.78	1.73	1.75	1.92	8.02
2	FEF 25%-75%	123.6	117	4.86	130.8	5.82	77.79	72.39	6.94	79.8	2.58	99.32	93.52	5.84	1.09	9.56

### Discussion

Lung function after treatment of chronic pleural empyema was evaluated by many authors() especially with regards to spirometrics parameters. We expect this study to support data concerning the lung function following decortication, pneumonectomy and tumour excision. The aim of our study was to determine the function of the re-expanded lung at different functional level by evaluation of spirometry before and after lung surgery. In the present study 50 cases of various pulmonary diseases chosen randomly, presented to the dept. of Cardiothoracic Surgery, hamidia hospital, Bhopal (m.p.).The age distribution clearly shown the predominance of age group 20-30 years with 14 cases [28%] this is the peak time for most of the Lung Disease i.e. Pulmonary Tuberculosis and its complication (Hydropneumothorax, Pyothorax) presented clinically. This is similar to Dauglas Carroli, John McClement Andre Courmand<sup>7</sup> [1950] reported in their study. Also, male subjects were more compared to female subjects which is also in correlation with Douglas Carroli, John McClement, Aaron Himmelstein and andre Courmand [1950] studied 9 patient out of which 8 patient were male and 1 was female. Majority of cases presented had complication due to pulmonary tuberculosis whereas only one had post traumatic empyema. In this study patient in which decortications was done showed remarkable improvement in pulmonary function on 7<sup>th</sup> post operative day with FVC increase of 8.02% and FEF 25%-75% increased of 9.56%. While in case of cyst/mass excision or pneumonectomy, the result show either no improvement or insignificant improvement.

### Conclusion

This study showed that the maximum incidence of pulmonary disease were observed in 20-30 yrs of age group also it was observed that pulmonary disease are more common in males (38 cases) compared to females (12cases). Skiagram chest P.A. view was the gold standard radio imaging modality of assessment of cases pre-operative pulmonary function test showed marked reduction in relation of predicted values i.e. FVC – 54-66% & FEF 25-75% 55%-74%. Post operative pulmonary function testing showed marked improvement in relation to pre-operative values. With decortications showed maximum increase compared to pneumonectomy and excision mass cyst.

### References

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