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Prospective study of surgical management of drug resistant and complications associated with pulmonary tuberculosis

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Abstract

Introduction: Tuberculosis (TB) is a ubiquitous, highly fatal contagious chronic granulomatous bacterial infection. It is mainly an infection of the lungs but can affect almost any part of the body. Although TB is a preventable and treatable disease, yet it still poses a significant threat globally. In 2012, an estimated 8.6 million people developed TB and 1.3 million died from the disease. Modern tuberculosis treatment relies on chemotherapy, surgery is accepted as adjuvant treatment for MDR TB.

Methodology: This study include total of 40 diagnosed cases of MDR or XDR pulmonary tuberculosis with it's complications.

Known cases of pulmonary tuberculosis with multidrug resistance and Extensive drug resistance with complications in Department of surgery, M.G.M medical college and M.Y Hospital, Indore.

Result: The mean age of presentation was $38.82 \pm SD$ years, Thoracotomy with Decortication was the most commonly performed procedure in (72.5% patients), Lobectomy in 20% patients, Pneumonectomy in 5% patients and Segmentectomy 3% patients. Postoperative complication occurred in 10 patients (25%), 2 deaths occurred in this study within 3rd postoperative day. Overall mortality was 5%, Out of 40 Patients complete cure was obtained in 85% of the treated patients, All patients had adjuvant chemotherapy post operatively for mean duration of 15.58 months with follow up for 12 to 18 months.

Conclusion: The resectional surgery has a distinct role in the management of MDR/XDR tuberculosis. The proper selection of the patients and early decision for surgical intervention can achieve a high success rate of drug resistant pulmonary tuberculosis with well localised pulmonary lesion.

Keywords: Thoracotomy, decortication, pneumonectomy, lobectomy

Introduction

The operative management of pulmonary tuberculosis is the most important advance in surgery in the twentieth century. This offers to a large group of people a chance to escape certain death and to become permanently well. It also allows these individuals an opportunity to earn a living and to return to their families and communities. The majority of cases operated upon, are those who have shown no improvement by other methods and would surely have died of tuberculosis [1]. Surgical operations for the treatment of TB have a long history, predating the discovery of *M. tuberculosis*. For almost two centuries before the introduction of effective anti-TB medicines, surgery was one of the main treatment options for TB [2, 3].

Methodology

This study was approved by Ethical Committee and it was a part of post graduate dissertation in M.Y. Hospital, Indore.

Preoperative evaluation included standard radiography, CT scanning, spirometry, arterial blood gas analysis, routine laboratory analyses and an enzyme-linked immunosorbent assay for HIV. The medical and surgical staff evaluated each patient individually to determine their suitability for surgery. Patients were included if they had unilateral or bilateral pulmonary lesions localised to permit resection; sufficient pulmonary reserve to tolerate pulmonary resection as determined by spirometry and assessment of residual parenchyma on preoperative CT scanning. Patients with a vital capacity, 50% and forced expiratory volume in 1 s (FEV1), 800 ml, those with cardiac.

Insufficiency evaluated by a cardiologist and patients with severe malnutrition were excluded.

The risks and benefits of surgery, as well as the prognosis with and without a surgical intervention, were discussed with the patient and informed consent was obtained for all patients who underwent surgery.

Observation & results

Table 1: Age wise distribution

S. No.	Age	No. of Patients	%
1	<20	01	2.5
2	20 – 30	13	32.5
3	30 – 40	09	22.5
4	40 – 50	10	25
5	50 – 60	05	12.5
6	> 60	02	5

Table 2: Symptoms

S. No.	Symptoms	Present Symptoms	Not Present Symptoms
1	Cough	31	09
2	Fever	33	07
3	Weight Loss	25	14
4	Expectoration	15	25
5	Chest Distress	16	24
6	Hemoptysis	14	26

Table 3: Associated comorbidity with underlying diseases.

S. No.	Comorbidity Or Pressure	No. Of Patients	%
1	Diabetes	03	7.5
2	Chronic Liver Diseases	03	7.5
3	COPD	01	2.5
4	Hepatitis	00	00
5	HIV	01	2.5
6	HTN	03	7.5

Table 4: Most Common Side

S. No.	Procedure	No. Of Patients	%
1	Rt Side	27	67.5
2	Lt Side	13	32.5

Table 5: Radiological results

S. No.	Radiological Characteristics	No. of Patients	%
1	Pyothorax	10	25
2	Hydropneumothorax	09	22.5
3	Pyopneumothorax	07	17.5
4	Pleural effusion with pleural thickening	05	12.5
5	Lung empyema with lung collapse	05	12.5
6	Pyothorax with Broncho pulmonary fistula	04	10

Table 6: Surgical Procedure

S. No.	Procedure	No. of Patients	%
1	Thoracotomy with Decortication	29	72.5
2	Thoracotomy with Lobectomy	8	20
3	Thoracotomy with Pneumonectomy	2	5
4	Thoracotomy with Segmentectomy	1	2.5

Table 7: Post Operative Complications

S. No.	Procedure	No. of Patients	%
1	None	30	75
2	Pyothorax with Broncho-pulmonary fistula,	03	7.5
3	Respiratory failure	03	7.5
4	Broncho-pulmonary fistula	01	2.5
5	Arrhythmia	01	2.5
6	Wound Infection	02	5

Table 8: Operative and postoperative Mortality

S. No.	Mortality	No of Death	Cause of Death	%
1	Operative	0		00
2	postoperative	2	Respiratory failure	05

Table 9: Results of Surgical Treatment

S. No.	Results	No of Patients	%
1	Cured	34	85
2	Clinical worsening	4	10
3	Operative death	0	0
4	Postoperative death	2	5

Discussion

A total of 40 patients with MDR/XDR TB underwent surgical procedure. The mean age of presentation was 38.82 ±SD years, with range of 20 -60 years. The maximum patients were between the age group of 20-30 years (32.5%).

At the time of operation all patients were already diagnosed with MDR/XDR TB, and taken chemotherapy prior to surgery for mean duration of 3.95 months.

Major preoperative clinical manifestations included chronic cough (in 31 patients), fever (33), weight loss (25), Expectoration (15), Chest distress (16), Haemoptysis (14) [4].

Radiological findings in the patients in our study included pyothorax in 25% patients being the most common finding, hydropneumothorax in 22.5% patients, pyopneumothorax in 17.5% patients, pleural effusion with pleural thickening in 12.5% patients, Lung empyema with lung collapse in 12.5% and Pyothorax with bronchopulmonary fistula in 10% patients.

Thoracotomy with Decortication was the most commonly performed procedure in (72.5% patients). Other procedure included Lobectomy in 20% patients, Pneumonectomy in 5% patients and Segmentectomy 3% patients [5].

Postoperative complication occurred in 10 patients (25%). Major complications were pyothorax with Broncho-pulmonary fistula in 3 patients (7.5%), respiratory failure in 03 patients (7.5%), one patient developed Broncho-pulmonary fistula (2.5%) and one patient developed arrhythmia (2.5%) while wound complications were present in 2 patients (5%). 2 deaths occurred in this study within 3rd postoperative day, Both of the patients developed respiratory failure and shifted to surgical ICU on ventilatory support, even on ventilatory support patients did not improved and died on 3rd postoperative day. Overall mortality was 5% [6].

Out of 40 patients complete cure was obtained in 85% of the treated patients, clinical worsening in 10% cases. All patients had adjuvant chemotherapy post operatively for mean duration of 15.58 months with follow up for 12 to 18 months [7, 8].

Conclusion

The resectional surgery has a distinct role in the management of MDR/XDR tuberculosis.

The proper selection of the patients and early decision for surgical intervention can achieve a high success rate of drug resistant pulmonary tuberculosis with well localised pulmonary lesion.

The criteria for selecting the patients for adjunctive surgery included patients with MDR/XDR TB who have a localised lesion to resection treatment failure despite aggressive medical treatment and patients with a high risk of relapse.

The purpose of surgical intervention in MDR/XDR TB is to remove a large, focal burden of bacilli present in necrotic and nonviable lung tissue. By removing the main focus of infection, it may be possible to prevent further disease spread and allow medical therapy to work better.

Patients with MDR/XDR TB underwent adjunctive surgery had high rates of favourable outcomes, with 85% cure rate in our study.

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