

Surgical interventions in multidrug-resistant tuberculosis : Retrospective analysis of 74 patients treated at a tertiary level care centre

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Abstract

Background: Multidrug-resistant tuberculosis is a serious threat to tuberculosis control world wide with ominous implications in Indian context. The medical treatment of this disease is expensive, toxic and, most unfortunately, far from satisfactory. In carefully selected cases adjuvant surgery plays very significant role in achieving bacteriological cure.

Methods: Retrospective analysis was done in 74 cases of multidrug-resistant tuberculosis, in whom some surgical interventions were carried out at L.R.S. Institute of Tuberculosis and Respiratory Diseases New Delhi between the years 1999 to 2003. There were 52 male and 22 female patients in the age group of 24 to 40 years. All were sputum positive at the time of surgery. Majority of patients were treated with pulmonary resections (Pneumonectomy [n = 37], Bilobectomy [n = 09] and Lobectomy [n = 21]), while Primary Thoracoplasty with Apicolysis was planned in 7 patients. Post operatively 2nd line anti tubercular chemotherapy was prescribed for 24 months.

Results: There were 03 early and 02 late deaths. Postoperative complications were seen in 24 cases. Eight patients developed bronchopleural fistula with empyema. At a mean follow-up of 2.8 years bacteriological cure was achieved in 62 patients

Conclusion: Judiciously performed adjuvant surgery can yield excellent long term bacteriological cure with acceptable mortality and morbidity in multidrug-resistant tuberculosis. Morbidity and drug compliance remain as problem areas. (*Ind J Thorac Cardiovas Surg* 2006; 22: 15-18)

Key words: Multidrug-resistant-Tuberculosis, Pulmonary resection, Thoracoplasty

Introduction

From beginning as Collapse therapy¹ to becoming superfluous in the post streptomycin era, surgery in tuberculosis has tended to have come the proverbial full-circle in the wake of multidrug-resistant tuberculosis (MDR-TB). MDR-TB, defined as tuberculosis showing resistance to ,at least, Isoniazide and Rifampicin irrespective of resistance to other drugs is a serious threat to tuberculosis control world-wide.

Current prevalence rate of MDR-TB in India, in newly

diagnosed cases, is about 3.4% or less², and is much higher in patients already treated for tuberculosis, and hence constitutes a serious public health concern. Commonest risk factor for the development of MDR-TB is a previous exposure to anti-tuberculous therapy (ATT) and of late, Human Immunodeficiency Virus (HIV) infection has emerged as an important predisposing factor^{2,3}.

The medical treatment for MDR-TB is prolonged, toxic and suboptimal with predicted success rate of less than 50% vis-à-vis over 90% success for drug - susceptible strains^{2,4}.

Increasingly, since the last decade in particular, surgical interventions are being employed in the overall management of MDR-TB, with good results⁵⁻⁸.

Here is a report of our experience with surgical interventions in cases of MDR-TB, carried out at our tertiary level health care centre.

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Methods

Patients' Profile

We retrospectively analyzed the data of our patients with MDR-TB in whom surgical interventions were used. Between the years 1999 to 2003, 74 patients underwent surgical procedures for MDR-TB. There were 52 male and 22 female patients in the age group of 24 to 40 years. The mean follow-up period was 2.8 years (2.0 to 5.0). Four patients were lost to follow-up. All patients were HIV negative. None of the patients had any gross evidence of bilateral disease.

Pre-operative Evaluation and Preparations

Patients were comprehensively evaluated by the medical and surgical chest specialists and the decision for surgical interventions was jointly taken in all cases. The work-up included baseline laboratory investigations, sputum studies, chest radiograph, contrast-enhanced computerized tomography (Thorax), bronchoscopy, and spirometry. All patients were routinely tested for HIV. Pre-anaesthetic check ups were done to assess their fitness to withstand the surgical procedure. Their Sputums were positive for mycobacterium tuberculosis and sensitivity tests were requested, which confirmed their MDR-TB Status. Preferably three months of individually tailored 2nd line ATT was prescribed, in consultation with the referring pulmonologist, except in emergency state when earlier intervention was necessary.

Informed consent included detailed discussion with patients with particular emphasis on the importance of chest physiotherapy perioperatively, cessation of smoking where applicable, and the necessity of continuation of 2nd line ATT for further 24 months post-operatively. Most of the patients were nutritionally depleted and efforts were made to ensure as much restoration of general health as possible.

Surgical Interventions

Persistence of sputum culture positive MDR-TB after 3 to 6 months of planned chemotherapy was the main indication of surgery in either cavitary or destroyed lung lesions. Surgical procedures were mainly of resectional nature, namely Pneumonectomy, Bilobectomy or Lobectomy, depending upon the extent of the disease.

In some emergency cases with haemoptysis where general condition of the patient was poor for major resection alternative intervention as primary thoracoplasty with apicolysis was planned.

Resectional surgeries were carried out using double lumen endotracheal tube under general anaesthesia through standard posterolateral thoracotomy. Pre-

emptive measures, such as muscle flaps or tailored thoracoplasty, were not used with the initial operation to protect the bronchial stumps or to deal with residual space problems respectively.

Resected specimens were routinely sent for histopathological examination and AFB staining.

Post operatively 2nd line ATT were continued for 24 months after sputum Conversion.

On follow-ups, chest x-rays were ordered and sputum was examined for AFB at 1,3,6,12 months and at the completion of chemotherapy.

Disease Cure was taken when three consecutive sputum reports were negative and failure was defined with sputum positivity, whereas sputum conversion after a documented sputum negative report constituted relapse.

Table. 1. Surgical procedures used

Pneumonectomy	37
Lobectomy	21
Bilobectomy	09
Primary Thoracoplasty	07
Total	74

Table. 2. Mortality

Early Deaths	
Intraoperative Bleeding	01
Sepsicemia	01
Respiratory Failure	01
Late Deaths	
Cachexia With Sputum Positive-	
-MDR-TB	02
Total Deaths	05

Table 3. Postoperative Complications

Empyema With Bronchopleural	
Fistula :	07
Atelectasis :	07
Wound Infection :	06
Persistent Air Leaks :	04
Total :	24

Results

In our study there were 3 early postoperative deaths occurring within 30 days of surgery and 2 late deaths (Table 2), translating into 4.05 % early and 2.70 % late mortality. Post operative complications (Table 3) included bronchopleural fistula [BPF] with empyema, atelectasis, wound infections, and persistent air leaks, which occurred in 24 (32.43%) cases. Atelectasis and wound infections were managed conservatively while air leaks responded to prolonged intercostal tube

drainage only in 2 cases and other 2 cases necessitated secondary thoracoplasty. Bronchopleural fistula with empyema were treated by open drainage [Pleurocutaneous flaps] with or without subsequent secondary thoracoplasty.

Initially all alive 69 patients were sputum negative at 1, 3 and 6 months postoperatively but later on 7 of them changed to positive status between 12 to 18 months on follow-up. At least 5 of these 7 late sputum converters admitted to have defaulted on 2nd line ATT and four of these patients were lost to subsequent follow-up. Thereafter only 3 patients continued to test sputum positive during their followup. Hence on the whole sputum could be made negative in 62 (83.78 %) patients.

Table 4. Sputum Status

Total MDR-TB Patients :	74
Sputum Positive At The Time Of Surgery :	74
Post Operative Sputum Status	
1. Negative At Upto 6 Months :	69 (All Alive Patients)
2. Negative Beyond 18 Months :	62
3. Lost To Follow Up :	04
4. Persistently Positive :	03 (During Follow Up)

Discussion

Surgery plays an important role in the overall management of MDR-TB with acceptable mortality and morbidity^{2,3,5,8}. Surgical interventions, in carefully selected cases, along with 2nd line ATT appears as the most favorable option since even the best available medical therapy alone is only provides bacteriological cure in the order of 44- 77 % vis-à-vis more than 90 % success rate with adjuvant surgery³.

Operative mortality is no longer a prohibitive issue, with most series reporting under 3% early mortality^{7,8} and we were also able to ensure acceptable operative deaths inspite of poor general health of our patients.

Though operative mortality has decreased but significant morbidity continues to be a nagging problem of surgery in tuberculosis being reported in about 20-25% of cases in many series^{3,9,10} and least claimed as 15% of major complications by others^{7,8}. Such complications have similar spectrum in most reports, BPF with empyema formation being the most distressing manifestation. Given that poor nutritional status and sputum positivity at the time of surgery are found to have been associated with higher rate of complications, we believe the morbidity in the present series is self-explanatory.

Unequivocal consensus is lacking in the literature regarding the application of perioperative chemotherapy. The rationale behind selecting the exact timing of intervention needs to be logical and scientific, and whereas it appears logical to use surgery after a defined induction phase of chemotherapy, a scientifically defined induction phase needs to be worked out. Generally accepted timing of surgery is after 3 months of carefully prescribed 2nd line ATT, achieving optimal bacterial suppression at the time of surgery yet avoiding delaying the surgery to a point where the bacillary load is at a perilous high^{5,7,11}. Continuation of drugs for 18-24 months postoperatively seems reasonable by most authors^{2,3,5,7,11} and we advise postoperative chemotherapy for 24 months from the time of documented sputum negativity though, given the economics involved, completion of this task is frankly daunting, if not utopian, in our subset of patients.

Indications of surgery in MDR- TB remain a contentious issue, however broad consensus is apparent in this context at least in lateralized disease and generally accepted indications include^{2,3,5,7-11} : a) high risk of treatment failure/relapse, including history of 2 or more relapses or 1 or more relapse while on therapy, and persistently positive sputum despite 4 to 6 months of treatment and b) localized lesion. Other advocated indications have been c) intolerance to medication⁷ and d) bilateral disease with cavitary lesions on one side and infiltrative lesions on the other^{5,11}.

Bacteriological cure in many series has been fairly impressive, with well over 90% success achieved with adjuvant surgery³. Most such series are from the western world and there is no significant Indian data to compare with our seemingly low sputum clearance. But we feel that this may be due to poor drug compliance and presence of active lung lesion in patient of thoracoplasty in our series. Perhaps more such studies from Indian centres will help us to realize the actual potential of adjuvant surgery in MDR-TB.

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