Bangabandhu Sheikh Mujib Medical University Journal 2024;17(1):00-00 bsmmuj.org
ISSN 2074-2908 | eISSN 2224-7750 | © CC-BY-NC-4.0 doi: 10.3329/bsmmuj.v17i1.63667

RESEARCH LETTER

Surgery for complicated pulmonary tuberculosis

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Robert Koch's discovery of the tubercle bacillus significantly advanced tuberculosis treatment.[1] Various therapies were used during the sanatorium era, including surgery.[2] The discovery of streptomycin and chemotherapy greatly reduced the need for surgery.[3] However, surgical treatment remains relevant due to treatment failures, complications, and the impact of other disease sequelae.[4]

We reviewed 427 cases who underwent surgical interventions for pulmonary tuberculosis in the Department of Cardiovascular and Thoracic Surgery at the Sher-i-Kashmir Institute of Medical Sciences, Soura, Srinagar, Jammu & Kashmir, India, from January 2005 to January 2014. Patients who were managed with tube thoracostomy, rib resection, and open window thoracotomy were excluded. The primary indications for surgical procedures included massive recurrent haemoptysis, other chest symptoms, and empyema in patients with pulmonary tuberculosis. In addition to routine investigations, brochovascular washing for acid-fast bacilli, pulmonary function tests, and cardio-respiratory status assessments were done. Disease localization was confirmed with imaging, including tomography.

The patients were aged 23 to 57, and 72% of them were men. Of 427 cases, 258 underwent surgery for massive recurrent haemoptysis. Patients of this group experienced at least two episodes of haemoptysis, and required hospitalization, with over 500 ml of blood loss within 24 hours. In this group, tubercular cavities or destroyed lungs were in 102 patients, aspergilloma was in 61 patients, and post-tubercular bronchiectasis was in 95 patients. The surgical procedures performed consisted of pneumonectomies (19.8%), lobectomies (72.1%), and bi-lobectomies (8.1%) of this group.

HIGHLIGHTS

1. Surgical treatment of massive recurrent haemoptysis and empyema in pulmonary tuberculosis can save lives in case of medical treatment failures and complications.
2. Postoperative empyema and broncho-pleural fistula are best managed by prolonged tube drainage followed by open-window thoracostomy and thoracoplasty if required.

Empyema was relatively common and managed by chest physicians, with surgery being resorted to whenever necessary. A total of 169 patients underwent empyema surgery. They were treated with intercostal tube placement, often with or without rib resection (66.5%), decortications (32.1%), and open window thoracostomy (1.4%).

We observed 20 (4.7%) early deaths (within six months of treatment) in this series. Hemorrhage (n=7), respiratory failure (n=9), and septicemia (n=4) were the cause of early deaths. The late deaths were primarily because of progressive tubercular disease and cachexia. Among the late deaths, partial data were available. Broncho-pleural fistula, wound sepsis, prolonged air leak, and pneumonia were common causes.

The knowledge of surgical treatments in tuberculosis is primarily based on case reports, retrospective studies, experience, and consensus.[2] Indications for such surgery are to rule out cancer, failure of chemotherapy, destroyed lung, failed operation, haemoptysis, multi-drug resistant tuberculosis, pleural disease, and aspergilloma.[3] The outcome of surgery is usually good, although a few deaths are encountered,[5] similar to ours. The hospital records do not have data on minor

Received: 1 Jan 2023 | **Revised version received:** 23 Dec 2023 | **Accepted:** 21 Jan 2024 | **Published online:** 31 Jan 2024
Responsible Editor: M Mostafa Zaman | **Reviewer:** Rijwan Bhuiyan

TABLE 1 **Clinical findings of the patients with pulmonary tuberculosis complications (n=427)**

Variables	Percent
A. Massive recurrent haemoptysis surgery group (n=258)	
Indications	
Tubercular cavities or destroyed lungs	39.5
Aspergilloma	23.6
Post-tubercular bronchiectasis	36.8
Types of surgery	
Pneumonectomies	19.8
Lobectomies	72.1
Bilobectomies	8.1
B. Empyema surgery (n=169)	
Intercostal tube placement	66.5
Decortications	32.1
Open-window thoracostomy	1.4
C. Early (within six months) deaths (n=20)	4.7

complications, but broncho-pleural fistula is fairly common (7.3%). If required, we could best manage postoperative empyema and broncho-pleural fistula by prolonged tube drainage followed by open-window thoracostomy and thoracoplasty.

We used the most recent techniques, including cardiac monitors, anesthesia support, pediatric fibre-optic bronchoscope securing correct placement of the double-lumen endotracheal tube, liberal use of electrocautery, staplers for bronchial stump closure and adequate postoperative pain relief with epidural catheters.

Despite the advances in medical therapy for pulmonary tuberculosis, its failure and complications continue to warrant surgical treatment for saving lives. We document here short-term benefits of surgery. However, long-term benefits of such surgery need to be examined.

Acknowledgments

We express our heartfelt appreciation to the colleagues who extended generous support for the documentation of patients' information.

Author Contributions

Conception and design: FAG, NUW, MG, HZA, MHB, IQN. *Acquisition, analysis, and interpretation of data:* FAG, NUW, MG, HZA, MHB, IQN. *Manuscript drafting and revising it critically:* FAG, NUW, MG, HZA, MHB, IQN. *Approval of the final version of the manuscript:* FAG, NUW, MG, HZA, MHB, IQN. *Guarantor of accuracy and integrity of the work:* FAG.

Funding

This work did not receive any funding.

Conflict of Interest

We do not have any conflict of interest to disclose.

Ethical Approval

Because the study was done based on the hospital records, no ethical approval was sought from any authority. However, their consent was obtained for using their data to improve the services to the ailing humanity.

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