Role of Surgery in DR- Tuberculosis

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IMPLICATIONS

• TB Surgery- a high-cost intervention
• Moderate to high risks of complications
• Indicated for patients who would be likely to derive the most benefits
• Contra-indicated for patients who may respond to medical treatment alone
• The decision to perform surgery should be taken jointly by the TB physician, surgeon, and anaesthesiologist and with any other specialist when co-morbidities are concerned, and in close consultation with the patient and family
Issues in DR-TB

- Costly drugs
- Complex problem
- Drug-toxicity
- Low efficacy of drugs
Broad Indications for Surgery

• Suitable for selected cases
• Localized Disease
• Adequate Trial of ATT
• Localized cavities/nodules
• Drug Failures
• Chronic secretors

New treatments and approaches to Tuberculosis
Tuberculosis Symposium – Eastern Europe and Central Asia
RA Ministry of Health and Médecins Sans Frontières
Specific Situations Suitable for Surgery

- Cultures persistently positive beyond 4-6 months of appropriate treatment
- Culture re-version to positive during treatment
- MDR TB with additional resistance to 2nd line drugs
- Extensive TB (more than one lobe/bilateral)
- Cavities (diameter or > 10cm) or extensive fibrosis of the lungs (more than one lobe/bilateral)
- Previous non-adherence to treatment (interruption or missing doses is >20%)
- High bacillary load before starting the treatment
- Some co-morbidities (diabetes, COPD, HIV), low BMI, alcoholism
Pre-requisites before Surgery

- Adequate pulmonary reserve
- Localized infection
- Medical therapy of at least 4 weeks just prior to surgery
- Minimal sputum
- Cessation of smoking
- Cardiac reserve
- Adequate nutritional status
NITRD Experience – 20 Years

• Surgeries done for DR-TB: 107
  • Males : 80
  • Females : 27
  • XDR cases : 4

6 cases done in Armenia in March 2013 under MSF
Surgical Procedures done

- Pneumonectomy : 71
- Lobectomy : 20
- Bilobectomy : 5
- Non-anatomical : 4
- Thoracoplasty : 7
Results

• Sputum negativity achieved after surgery: 93
• Early mortality: 3
• Late mortality: 5
• Complication of BPF and Empyema: 6
• Late conversion to sputum positivity: 12
• Lost to Follow up: 18
• Declared Cured after Follow Up of 4 years: 62
A patient of DR-TB requiring Pneumonectomy
A typical DR-TB case suitable for Thoracoplasty and Apicolysis
Post-operative X-ray after Thoracoplasty
Intra-operative photograph of Thoracoplasty and Apicolyis
Some issues Regarding Surgery

• Done under GA with double-lumen endotracheal intubation
• Difficult dissection because of dense adhesions
• Adequate quantities of blood required
• Heppa filters and disposable anesthesia circuits required for protection of personnel
• VATS approach generally inappropriate but suitable in very localized lesions
Indications for Pneumonectomy

- Destruction of an entire lung
- Multiple cavities in one lung
- Stenosis of the main stem bronchus
- Infection involving more than one lobe of the lung
Indications for Thoracoplasty

- Patient not suitable for resectional surgery because of poor pulmonary reserve
- Bilateral disease with large apical cavity
- Other medical contra-indication to lung resection
- Empyema needing treatment with thoracoplasty
Post-operative ATT

- **Chemotherapy in the post-surgical period**
  - Surgery does not allow shortening of the TB treatment course. Even after successful lung resection, the patient should complete a full course of treatment.
- **XDR or ‘Pre XDR’ patients:**
  - If the patient is culture positive at the time of surgery:
    - =>Continue treatment for at least 24 months post culture conversion
  - If the patient is culture negative at the time of surgery*:
    - =>Continue treatment for 24 months post culture conversion and not less than 6 months after the surgery.
- **MDR patients:**
  - If the patient is culture positive at the time of surgery:
    - => Continue treatment for at least 18 months post culture conversion
  - If the patient is culture negative at the time of surgery*:
    - =>Continue treatment for at least 18 months post culture conversion and not less than 6 months after the surgery.
Post-operative ATT

- **PDR patients:**
  - Post surgical chemotherapy will depend on:
  - If the patient is culture positive at the time of surgery:
    - => Continue treatment for **7-12** months (depending on the type of PDR - see TB guidelines) post culture conversion.
  - If the patient is culture negative at the time of surgery*:
    - => Continue treatment for **7-12** months (depending on the type of PDR – see TB guidelines) post culture conversion and not less than 6 months after the surgery.
  - *Wherever possible, resected lung tissue should be given to the NRL for culture. If live bacilli are found in the specimen this should be considered as a positive culture even if sputum culture was negative. Treatment duration should be adjusted accordingly.
  - ‘Pre XDR’ = MDR + ofloxacin resistance or MDR + second line injectable drug (SLD) resistance
Recent Technologies that have improved the results of TB Surgery

- Double lumen endotracheal tube
- Pediatric fibrebronchoscope
- Surgical staplers
- Tissue patch
- Fibrin glue and other hemostatic agents
- Argon beam coagulation
- Digital portable chest drainage systems having adjustable suction
Contra-indications of Surgery in Pulmonary TB

• Extensive cavitary lesion of the both lungs
• Impaired pulmonary function test; that is forced expiratory volume in one second less than 1.5 L in cases of lobectomy and less than 2.0 L where pneumonectomy is planned
• Pulmonary-heart failure III–IV (functional classification of the New York Heart Association)
• Body mass index up to 40–50% of the normal range
• Severe co-morbidity (decompensation in diabetes, exacerbation of stomach and duodenum ulcers, hepatic or renal impairment)
• Active bronchial TB
Postoperative Care

- Proper analgesia, including opioids
- Active physiotherapy and respiratory exercises, including incentive spirometry
- Daily chest X-rays for the first three days
- Diagnostic and/or curative bronchoscopies if needed
- Removal of chest drains when their output has stopped
- Watching carefully for the early and late development of postoperative complications, such as air leaks, bronchopleural fistulas, residual pleural space and pleural empyema, and undertaking treatment procedures as necessary (including surgical interventions in the case of clear indications)
Extensive Review of Literature done by WHO Experts on this topic

The role of surgery in the treatment of pulmonary TB and multidrug- and extensively drug-resistant TB (external URL)
Conclusions

• Surgery for MDR TB is a Multi Disciplinary and challenging proposition
• It is mainly a problem of poor and emerging economies
• Surgery in selected cases of MDR-TB in addition to reserve drugs offers the best chance of prolonged sputum negative state or cure
Thank You