Postpneumonectomy Broncho-pleural Fistula Treatment From Aggressive to Minimally Invasive Approach

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Introduction

Post-pneumonectomy broncho-pleural fistula is a severe complication, posing a high mortality rate and an important decrease in the patient`s general status.

Mortality ranges from 20% to 70%

Usually occurring in the first 90 days

Most common cause of death is aspiration pneumonia and ADRS

May require up to three surgical procedures over a period of two years

Materials and Method

- Wide experience of Marius Nasta Surgery Clinic regarding patients suffering from pulmonary tuberculosis
- Literature review
- Medical documents of patients that were admitted and treated in the clinic were analysed
- Review of the surgical protocols

Predisposing factors

Right pneumonectomy is 2.4x more likely to cause BSF than left pneumonectomy

Manual suture is more likely to cause BSF than mechanical suture

Bronchial stumps >1cm length have a higher risk of BSF

History of smoking

Pleuropulmonary infections (pneumonia, empyema)

Pre-existing lung disease (COPD)

Low preoperative FEV1

Diabetes mellitus

Prolonged mechanical ventilation

Anemia

HIV infection

Solutions

Invasive (Aggressive)

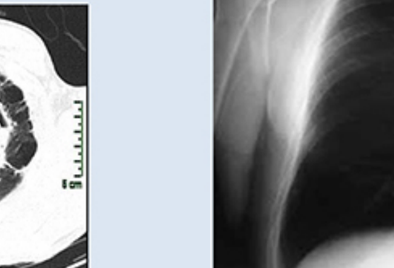
Transsternal transpericardial approach

Thoracotomy "classical" approach

Open-window "Clagett" thoracostomy and thoracomyoplasty

Minimally invasive

Transcervical approach



Surgical procedures

Trans-Sternal Transpericardial Approach

INDICATIONS

Suitable for late post pneumonectomy broncho-pleural fistula: empiema, short bronchial stump, malignant recurrence

Not suitable if history of previous cardiac and/or aortic surgery exists

The newly created stump must be protected with a tissue flap (thymus, pericardium, pleura)

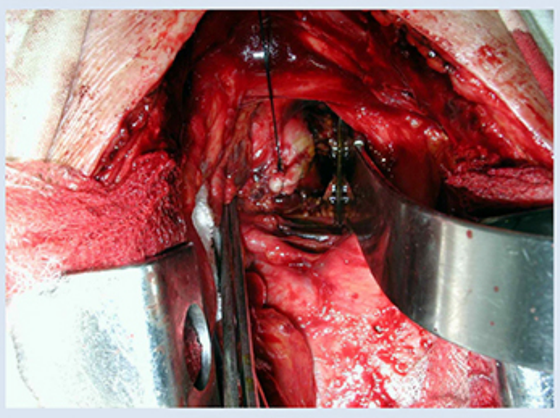
ADVANTAGES

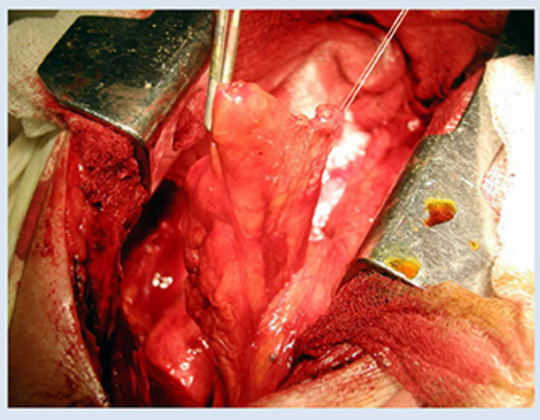
Median sternotomy if well tolerated by the patient

No post-operative ventilatory disfunction

The mediastinum is an aseptic space

The anatomy is unaltered





Transcervical Approach

ADVANTAGES

Reduced operative time

Closing of the bronchus in non-contaminated environment and isolation of distal stump

Bronchial stump is covered with surrounding tissue

Cost-effective (compared to other methods)

Comfort (pain, impaired breathing, chest scars of thoracotomy / median sternotomy)

DISADVANTAGES

Experience with mediastinoscopy

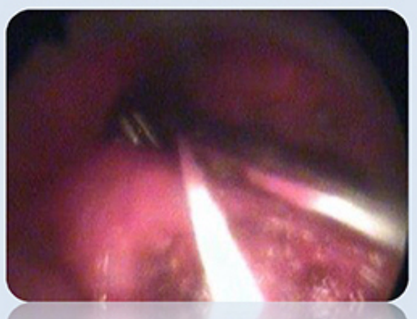
Requires a roticulator stapler and video-mediastinoscope

No previous procedures involving the mediastinum

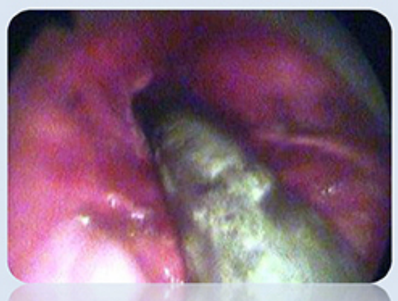
Maneuvering in a tight space

The bronchial stump must measure at least 1.5 cm in length

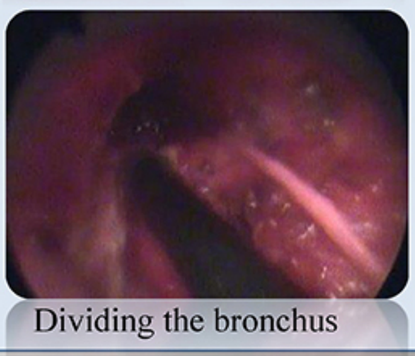
Disecting the bronchus and carina



Lacing the bronchus



Stapling the bronchus



Dividing the bronchus

Conclusions

Bronchial stump fistula closure approached through sternotomy is a simple technical procedure with great efficiency.

Bronchial stump fistula closure approached through transcervical videomediastinoscopy is a viable alternative to thoracotomy and transternal approaches.

A long stump requires standard reamputation.

A Short stump requires carinal resection.

References

1. Management of bronchopleural fistulas after pneumonectomy in tuberculosis patients by means of vascular occluders
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2. A. Bazhenov (Ekaterinburg, Russian Federation), I. Motus (Ekaterinburg, Russian Federation), I. Medvinsky (Ekaterinburg, Russian Federation), A. Tsvirenko (Ekaterinburg, Russian Federation), R. Basyrov (Ekaterinburg, Russian Federation), L. Kardapoltsev (Ekaterinburg, Russian Federation), P. Holniy (Ekaterinburg, Russian Federation), I. Dotsenko (Ekaterinburg, Russian Federation), S. Skornyakov (Ekaterinburg, Russian Federation). Management of bronchopleural fistulas after pneumonectomy in tuberculosis patients by means of vascular occluders. 2696