



ORIGINAL RESEARCH PAPER

Surgery

BRONCHIECTASIS: SURGERY WHEN AND WHY? A RETROSPECTIVE OBSERVATIONAL STUDY

KEY WORDS: lobectomy, wedge resection, Segmentectomy

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ABSTRACT

Background: We assessed and analyzed cases of bronchiectasis operated during 1 year period, its presentation, causes, surgeries performed, outcome and prognosis.
Methods: A retrospective observational study of 65 patients from march 2018 to march 2019. Patient unresponsive to medical management were treated surgically.
Results: The mean age was 37 years, male/female ratio was 2.25:1. Common symptoms were cough with foul smelling sputum and hemoptysis. The cause seen in our patient was mainly pneumonia, TB. CXR, CT scan, and bronchoscopy done in all patients. Bronchiectasis was mainly present in left lower lobe. Indications for surgery were failure of medical therapy (85%), haemoptysis (15%). Surgery done was lobectomy (47), wedge resection (2), Bi-lobectomy (10), and segmentectomy (6). Minor Complications occurred in 5%. 85% of patients had relief of their symptoms.
Conclusions: Surgery for bronchiectasis indicated if failure of medical management. Patient selection and pre op preparation the key for attaining better outcomes.

INTRODUCTION

Bronchiectasis was first described by Laennec in 1819 and before discovery of antibiotic it was considered a disease with high morbidity and mortality.¹ Bronchiectasis is defined as permanent dilatations of bronchi with destruction of the bronchial wall. The clinical presentation varies over wide spectrum with recurrent respiratory tract infections with copious sputum alternating with asymptomatic periods along with recurrent haemoptysis. Bronchiectasis occurs secondary to tuberculosis, pneumonia, mainly.²

Current reports about the surgical management for bronchiectasis show that limited localized disease was associated with good postoperative prognosis. The aim of this study was to analyze the cases of bronchiectasis in our tertiary care: its presentation, etiology, diagnostic tools, indications for surgery, surgical approach, and the outcome.

MATERIALS AND METHODS

We retrospectively reviewed the medical records of 65 patients who underwent surgery for bronchiectasis between 2018-2019 at the Department of Cardiothoracic and Vascular Surgery in Indira Gandhi Institute of Medical Sciences, Patna, Bihar. Variables as age, sex, symptoms, cause of bronchiectasis, lobe involved, surgery done, result of surgery were analysed.

Inclusion criteria

1. All symptomatic patient aged 20-60 years who were diagnosed as bronchiectasis which was localised, unresponsive with medical management

Exclusion criteria

1. All patient who were prior operated were excluded from study
2. Patient with widespread bronchiectatic lesions
3. Patient from remote area who were non compliant
4. Patient with multiple comorbidity
5. Patient with minor symptoms
6. Patient with bronchial adenomas and concomitant malignancies

Method

Patients were admitted to the department after referral from pulmonologist after giving several trials of antibiotics. Patient who required surgery were only referred to our department. Chest radiography (CXR), computed tomography of the chest (CT) to evaluate the type, severity, and distribution of bronchiectasis and pulmonary function tests were carried out for selected patients. All patients had intensive chest physiotherapy in the preoperative period. Physiotherapy was continued until the daily volume of the sputum decreased. Rigid and/or flexible bronchoscope was performed for all patients. The bronchial aspirate was sent for microbiologic culture analysis. Prophylactic antibiotics were given for 48 hours prior to surgery to prepare all patients undergoing surgery. Non surgical treatment with appropriate antibiotics, postural drainage, and bronchodilators were already tried by pulmonologist so, surgical planning were done.

Indication of surgery

1. Persisting symptoms despite several course of medical management
2. Wilfulness for surgery
3. Benefit outweighing risk
4. Recurrent pneumonia requiring hospitalization
5. Recurrent significant haemoptysis.

PROCEDURE

A double-lumen end tracheal tube was used in order to avoid contralateral contamination of secretions. A posterolateral thoracotomy was used for all patients. Complete resection is defined as an anatomic resection of all affected segments that were assessed preoperatively by computed tomography; wedge resection, Segmentectomy, Lobectomy, Bi-lobectomy was done accordingly. All resected specimens were subjected to histopathological examination in order to confirm the diagnosis. Postoperative management included intensive chest physiotherapy and administration of antibiotics and analgesics. All patients were followed up in our outpatient clinic.

RESULTS

A total of 65 patients underwent surgical treatment of

bronchiectasis in our department in the study period. The mean age of these patients was 37 years. Male to female ratio was 45/20. All patients were symptomatic. The most common presenting symptoms were recurrent infection with productive cough which occurred in all patients. Copious amount of foul smelling sputum was found in 82% patients and recurrent haemoptysis in 18%. The duration of symptoms ranged from 1 to 9 years. The possible causes were described in table below. Postero-anterior and lateral chest X rays and CT scan were done for all patients, but the diagnosis of bronchiectasis was based mainly on the chest CT scan finding. It determines the type and extent of bronchiectasis. Rigid and/or flexible bronchoscope was performed for all. The disease was more on left side than right. The disease was bilateral in 2 patients. Bronchiectasis involvement was predominantly in the lower lobes. The left lower lobe was affected in 28 patients and right lower lobe in 22.

Minor complications occurred in 5%, which prolonged ICU stay.

Table 1 Causes Of Bronchiectasis In Our Patients

H/O Recurrent chest infection since childhood-16 %
Pneumonia -59%
TB -19%
Unknown -6%

Table 2 Lobe Affected

Left lower lobe - 28
Right lower lobe - 22
Right Middle lobe - 4
Left upper lobe - 6
Right upper lobe - 1
Right lower and middle lobes - 4
Right upper and middle - 0

Table 3 Type Of Surgery No. Of Patients

Wedge resection	2
segmentectomy	6
Lobectomy	47
Bilobectomy	10

DISCUSSION

Bronchiectasis is pathologically defined as a condition in which there are abnormal and permanent dilatations of proximal bronchi⁵. It is defined on a pathological basis of bronchiectatic changes such as tuberculosis. Before the antibiotic usage the disease was considered a morbid disease with a high mortality rate from respiratory failure^{2,3}. It is usually caused by pulmonary infections bronchial obstruction. The prevalence of bronchiectasis decreased significantly over recent times due to use of antibiotics. Recognition of foreign bodies with bronchoscopy also decreased the incidence of post-obstructive bronchiectasis.⁴ However, the incidence of bronchiectasis is still high in developing countries^{4,5}. Vendell and colleagues reported different causes of bronchiectasis including post infection, bronchial obstruction, immune deficiency, impaired mucociliary clearance, inflammatory pneumonitis, structural airways abnormalities and association with other disease. They also reported that the cause remains unknown in a fairly high percentage of patients. Pneumonia and tuberculosis were most common causes found in our patients.

Patients with bronchiectasis typically present with recurrent LRTI, productive cough, bronchial suppurative and copious sputum. Similar to our series, cough, purulent and fetid sputum, and haemoptysis are the most common symptoms in other series^{6,7}. Diagnosis of bronchiectasis is based on clinical history and CT scan findings. All the patients in our study had CT scan. CT criteria for diagnosis of bronchiectasis are well established (internal diameter of the bronchus more than 1.5 times than that of accompanying artery and evidence of lack of tapering of bronchi). Bronchoscopy is not a main diagnostic method for bronchiectasis, but it may be

helpful in identifying and removing foreign bodies, for locating the site of bleeding in patients with haemoptysis, and for diagnosis in narrowed bronchi or neoplasm's.

Preoperative bronchoscope should be routinely done to rule out benign or malignant cause of obstruction. In general, bronchiectasis affects most dependent portions of the lung, which includes posterior basal portions of the lower lobes, middle lobe and lingula. Overall one third of bronchiectasis is unilateral and affects a single lobe, one third is unilateral but affects more than one lobe, and one third is bilateral¹⁰. In our series, the disease affected the lower lobes in 50 patients more on left side.

The initial treatment strategy for all patients with this disease should be conservative. Medical management with antibiotics, bronchodilators and chest physiotherapy (postural drainage) are the main components of conservative treatment. If medical treatment is unsuccessful or recurrent episodes of LRTI or recurrent hemoptysis exist surgical therapy should be considered⁸⁻¹⁰. As was the case with other series, the indications for surgery in our study were failure of medical therapy, recurrent or massive hemoptysis.

The goals of surgical therapy for bronchiectasis are to improve the quality of life and to resolve complications such as empyema, severe or recurrent hemoptysis, and lung abscess. There is also consensus that, because bronchiectasis is a progressive disease, affected regions should be respected and uninvolved lung parenchyma should be preserved, and early pulmonary resection while the disease is still localized is preferred. Limited resection should be done. Therefore every type of resection is possible for these purposes.

In our study, patients with total resection of a localized bronchiectasis segment had good outcome in terms of decreased post op stay, and better quality of life. Regarding symptoms, the results of surgery can be considered satisfactory at our centre. More than 84% of our patients had relieved their preoperative symptoms. These results are similar to other series. The follow up time was short as we depend mainly on the out patient department visits. Follow up data were obtained from patient and post operative X Ray was s/o completely expanded lung, minimal pain, post op PFT was also done, though there were no major changes in it.

Our centre is a referral centre that covers a wide area and most of the patients were on followup for 3 months postoperatively and had significant improvement of symptoms. In conclusion, total surgical resection of bronchiectatic segment can be performed with acceptable morbidity and mortality for localized disease. Proper selection and preparation of the patients and complete resection of the involved sites are required for the optimum control of symptoms and better outcomes.

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