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Medical versus Surgical Management in Patients with Bronchiectasis

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ABSTRACT

Background: *Recent advancements in the fields of antibiotic therapy, vaccination and general health have decreased the number of surgical interventions for the treatment of bronchiectasis. On the other hand, improvements made in the field of lung surgery prompt some physicians and patients to pursue surgical treatment. We assessed the results of surgical treatment of bronchiectasis and compared them with the results of medical treatment during the same period of time.*

Materials and Methods: *The study population consisted of all patients who had referred to Masih Daneshvari Hospital and were admitted for treatment of bronchiectasis during a period of seven and a half years (March 1999 to September 2006).*

In this descriptive study, surgical or non-surgical treatment was adopted according to the usual indications for the treatment of bronchiectasis. Response to treatment was evaluated by referring to the patient's medical records and out-patient visits. The results were categorized into the following categories:

Good: Sputum production and other major signs completely disappeared. Satisfactory: Signs and symptoms did not totally disappear, but the patient was satisfied with the treatment results. Poor: No significant change was seen after the treatment.

Technique of surgery was postero-lateral thoracotomy under one lung ventilation and lobar or segmental resections. Medical treatment consisted of physiotherapy, antibiotic administration and vaccination against influenza and pneumococcus. Statistical analysis was performed using Access and SPSS software. Fisher exact and chi square tests were used for qualitative comparison of the results. The mean duration of follow- up was 35.9 months (range 1-96 months).

Results: *Eighty – three patients were studied (48 females, 35 males, mean age 37.8 years, range: 8-71 years); 40 patients underwent surgery while 43 underwent medical treatment. The results of surgery were good in 16(55.2%), satisfactory in 10 (34.5%) and poor in 2 (6.9%) patients. The results of medical treatment were good in 4 (13.8 %), satisfactory in 11(37.9 %), and poor in 13 (44.8%) patients. Good results were significantly more (P=0.002) and poor results were significantly less (P=0.002) after surgical treatment. In each group, one death occurred during the treatment course. Fourteen patients in the medical group and 11 patients in the surgical group were lost during the follow-up period.*

Conclusion: *When indicated, surgical therapy offers advantages over medical therapy in the treatment of bronchiectasis.*
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Key words: *Bronchiectasis, Treatment, Surgery*

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INTRODUCTION

Bronchiectasis is a word of Latin origin meaning dilation of the bronchi. A more suitable definition is "abnormal and persistent dilation of sub-segmental bronchi" (1). Clinically, the disorder can involve a lobe or a segment of the lung, multiple lobes or the whole lung. Pathologically, destruction of elastic and muscular layers is visible (2,3,4). From the histopathological aspect, there are 3 types of bronchiectasis: cylindrical, varicose, and saccular (cystic) (5).

From the clinical point of view, features such as recurrent and chronic respiratory infections with excessive expectoration are distinct (6,7) .

With regard to etiology, it may be congenital or acquired; however, in both types infection leads to destruction and inflammation of the bronchial wall. The most important factors that directly cause bronchiectasis include: congenital disorders of the muscular component of the bronchial epithelium, immune globulin disorders, cystic fibrosis, alpha antitrypsin disorders (Cartagener syndrome) , congenital and acquired disorders of the bronchial cartilages, pulmonary sequestrations, acquired infectious diseases (especially measles and pertussis during childhood), bronchial obstruction due to foreign bodies and tumors, external pressure on the bronchi due to abnormal lymph nodes , middle lobe syndrome, and bronchial constriction due to tuberculosis (TB).

At present, diagnosis of bronchiectasis is based on case history and computerized tomography (CT) scan especially high resolution CT (HRCT), while in the past, bronchography was the main diagnostic imaging method and surgery when possible was the usual method of treatment for bronchiectasis. At present, this disorder is usually treated medically. The basis of medical treatment is control and prevention of infection and includes antibiotic therapy, training for postural drainage, respiratory physiotherapy, improving the immune system, use of bronchodilators and removal of foreign bodies and /or tumors that cause bronchial obstruction. Because of the availability of suitable antibiotics and other supportive measures, surgery is not the common treatment of bronchiectasis (8,9). However, in cases where a lobe or a segment of the lung is involved and medical treatment does not adequately control the symptoms, resection of the affected segment is the best method of treatment (10-14). Surgery includes the anatomic removal of the diseased portion (usually a lobe or a segment). It is essential to perform CT-scan in order to detect the site of lesion accurately. Also, maximum effort should be made to avoid excision of normal lung tissue. Considering the fact that surgery is less frequently used in the management of bronchiectasis, most of our judgment in regard to the results of this type of treatment is based on earlier reports. It seems that because of improvements in surgical techniques and post operative supportive measures and also the availability of well-experienced thoracic surgeons, better results can be obtained by surgical treatment of bronchiectasis; therefore, we assessed the results of surgery as compared with medical management.

MATERIALS AND METHODS

The study group consisted of all patients who had been admitted to our hospital for treatment of bronchiectasis from March 1999 to September 2006. Their diagnosis was based on history, physical exam and CT-scan. In all patients, the lesions were mostly localized to one lung. If bilateral at least two normal lobes (except the middle lobe) were intact.

After admission, the patients were re-evaluated and the decision for surgical or medical treatment was made based on the patient's general condition and therapeutic indications for bronchiectasis. In patients in whom only one lobe was involved surgery

was performed. Resection was also recommended to those who had more than one lobe involvement and previous medical measures were ineffective and patient's respiratory reserve was normal. The surgical procedure, possible complications and the outcome were explained to the patient. Responses to medical and surgical treatments were evaluated by referring to patient's files, clinical evaluation and out-patient visits. The results were categorized as follows:

Good: Sputum production and other major signs completely disappeared. ***Satisfactory***: Although the signs and symptoms did not totally disappear, the patient was satisfied with treatment results. ***Poor***: No significant change was detected in the major signs and symptoms and the patient was not satisfied with the treatment results.

The patients underwent respiratory physiotherapy 1-2 weeks before the operation. In the presence of active infection, antibiotics were also administered. Bronchoscopy was performed in all patients usually after induction of anesthesia in the operating room. Anatomic lung resection (segmental or lobar) was done through a posterolateral thoracotomy and one lung ventilation with a double lumen tracheal tube.

Medical treatment consisted of physiotherapy, training to expectorate effectively, antibiotic administration and vaccination against influenza and pneumococcus. Bronchoscopy was also performed in patients who underwent medical therapy. Data were analyzed by Access and SPSS software. For comparison of results, Chi-square test and Fisher's exact test were used. In both groups, 28 patients were followed – up. The study was approved by the ethical committee of National Research Institute of Tuberculosis and Lung Disease (NRITLD).

RESULTS

A total of 83 patients (48 females, 35 males) were evaluated. The mean age was 37.8 years (range 8-71 years). Forty patients underwent surgical management while 43 received medical treatment. All had the major clinical features of bronchiectasis including cough, sputum and history of recurrent respiratory infections; however, chief complaints varied in different patients. (Table 1)

Table 1. Chief complaints of the patients

Complaint	Number	Percentage
Hemoptysis	49	59.1
Excessive sputum	28	33.7
Dyspnea	3	3.6
Chest pain	2	2.4
Cough	1	1.2
Total	83	100

Although the exact etiology of bronchiectasis was not elucidated, possible causes were determined based on history, clinical features and para-clinical findings (Table 2). When no cause could be identified, the term unknown was used. We assumed that in this group of patients with unknown etiology, a congenital disorder was the major cause of bronchiectasis.

Table 2. Possible causes of bronchiectasis

Etiology	Number	Percentage
Pertussis	1	1.2
Measles	2	2.4
Foreign body	3	3.6
Cartagener syndrome	4	4.8
TB	16	19.3
Unknown	57	68.7
Total	83	100

Tables 3 and 4 show the type of surgical resection and associated complications treated.

Table 3. Type of surgical resection

Type of surgery	Number	Percentage
Lobectomy	20	48.8
Lobectomy + Lingulectomy	9	22
Lobectomy + Wedge resection	3	7.3
Bi-lobectomy	3	7.3
Pneumonectomy	5	12.2
Segmentectomy	1	2.4
Total	41	100

Table 4. Surgical complications

Complications	Number	Percentage
Empyema	3	7.5
Hemorrhage	2	5
Atelectasis	1	2.5
Total	6	15

Table 5 demonstrates medical and surgical therapeutic results.

Table 5. Results of medical and surgical treatment in patients with complete follow – up.

Type of treatment Result of treatment	Surgical	Medical	P-value
Good	16(55.17%)	4(13.8%)	0.002
Satisfactory	10(34.48%)	11(37.93%)	NS
Poor	2(6.9%)	13(44.82%)	0.002

Two patients died, one after surgical treatment and one after medical treatment. The cause of death in both was pneumonia and sepsis.

The mean duration of follow – up was 3 months (range 1-96 months).

DISCUSSION

The significant finding of this study was the difference observed in the therapeutic results of surgical and medical treatments. The good results after surgical treatment were significantly greater than that of medical treatment (55.17% versus 13.8%, P=0.002). Although the study was retrospective, the type of treatment selected for the patients was based on the usual indications for treatment of bronchiectasis. Surgery was recommended to those who had localized bronchiectasis, symptoms did not resolve with medical treatment, and general condition and respiratory reserves were suitable for resection. The rate of surgical complications was 15% and all complications were mild and easily treated.

In various reports the rates of complications after surgical resection for bronchiectasis have been reported to be between 9.7% to 24.6% (13, 15-18).

Low morbidity and mortality and good results indicate that surgical resection is better than medical therapy in patients who have localized - resectable lesions and suitable condition to undergo surgery.

REFERENCES

1. Hodder RV, Cameron R, Todd TRJ. Bacterial infections. In Pearson FG, et al (eds): Thoracic Surgery. New York: Churchill Livingstone, 1995:13-17.
2. Barker AF. Bronchiectasis. ***Semin Thorac Cardiovasc Surg*** 1995; 7 (2): 112- 8.
3. Ip MS, Lam WK. Bronchiectasis and related disorders. ***Respirology*** 1996; 1 (2): 107- 14.
4. Mysliwiec V, Pina JS. Bronchiectasis: the 'other' obstructive lung disease. ***Postgrad Med*** 1999; 106 (1): 123-6, 128-31.
5. Reid LM. The pathology of obstructive and inflammatory airway diseases. ***Eur J Respir Dis Suppl*** 1986; 147: 26- 37.
6. Nicotra MB. Bronchiectasis. ***Semin Respir Infect*** 1994; 9 (1): 31- 40.
7. Nicotra MB, Rivera M, Dale AM, Shepherd R, Carter R. Clinical, pathophysiologic, and microbiologic characterization of bronchiectasis in an aging cohort. ***Chest*** 1995; 108 (4): 955- 61.

8. Doğan R, Alp M, Kaya S, Ayrancioğlu K, Taştepe I, Unlü M, et al. Surgical treatment of bronchiectasis: a collective review of 487 cases. ***Thorac Cardiovasc Surg*** 1989; 37 (3): 183- 6.
9. Sanderson JM, Kennedy MC, Johnson MF, Manley DC. Bronchiectasis: results of surgical and conservative management. A review of 393 cases. ***Thorax*** 1974; 29 (4): 407- 16.
10. Kutlay H, Cangir AK, Enön S, Sahin E, Akal M, Güngör A, et al. Surgical treatment in bronchiectasis: analysis of 166 patients. ***Eur J Cardiothorac Surg*** 2002; 21 (4): 634- 7.
11. Agasthian T, Deschamps C, Trastek VF, Allen MS, Pairolero PC. Surgical management of bronchiectasis. ***Ann Thorac Surg*** 1996; 62 (4): 976- 80.
12. Ashour M, Al-Kattan K, Rafay MA, Saja KF, Hajjar W, Al-Fraye AR. Current surgical therapy for bronchiectasis. ***World J Surg*** 1999; 23 (11): 1096- 104.
13. Fujimoto T, Hillejan L, Stamatis G. Current strategy for surgical management of bronchiectasis. ***Ann Thorac Surg*** 2001; 72 (5): 1711- 5.
14. Prieto D, Bernardo J, Matos MJ, Eugénio L, Antunes M. Surgery for bronchiectasis. ***Eur J Cardiothorac Surg*** 2001; 20 (1): 19- 24.
15. Ellis DA, Thornley PE, Wightman AJ, Walker M, Chalmers J, Crofton JW. Present outlook in bronchiectasis: clinical and social study and review of factors influencing prognosis. ***Thorax*** 1981; 36 (9): 659- 64.
16. Annest LS, Kratz JM, Crawford FA Jr. Current results of treatment of bronchiectasis. ***J Thorac Cardiovasc Surg*** 1982; 83 (4): 546- 50.
17. Vejlsted H, Hjelms E, Jacobsen O. Results of pulmonary resection in cases of unilateral bronchiectasis. ***Scand J Thorac Cardiovasc Surg*** 1982; 16 (1): 81- 5.
18. Balkanli K, Genç O, Dakak M, Gürkök S, Gözübüyük A, Caylak H, et al. Surgical management of bronchiectasis: analysis and short-term results in 238 patients. ***Eur J Cardiothorac Surg*** 2003; 24 (5): 699-702.