Original Research Paper

Clinical profile of patients undergoing fiber optic bronchoscopy

[1]Dr. Vijaya Kumar, [2]Dr. Siddartha S Angadi, [3]Dr. Praveen Kumar, [4]Dr. Vishwantha Malkappa Jalawadi

[1,3,4]Assistant Professor, Department of Respiratory Medicine, Shri BM Patil Medical college and Research Centre (BLDE),Vijayapura, Karnataka, India
[2]Assistant Professor, Department of Respiratory Medicine, SSIMS, Davangere, Karnataka, India

Corresponding Author:
Dr. Vishwantha Malkappa Jalawadi

Abstract

The flexible fiberoptic bronchoscope has continued to evolve since its introduction. The average adult bronchoscope has an external diameter of 4 to 6 mm and a typical viewing radius of 1200.The working channel for introduction of accessory instruments or suction is typically 1 to 3 mm in diameter. Ultrathin bronchoscopes for the evaluation of small distal airways are now available and have an external diameter of 2.7 mm. The source of data for the study was from the patients attending Department of respiratory medicine both out patients and in patients. Analysis of symptoms among patients, showed that cough was the most common symptom occurring in 45 patients (90%) and hemoptysis occurred in 10 patients (36%). Shortness of breath, fever and chest pain were seen in decreasing frequency in that order in 32 (64%) 30 (60%), 4(8%) respectively. With the use of Chi square test, we found that EBUS TBNA had sensitivity 88.88%, specificity 87.75%. Positive predictive value 57.11% and negative predictive value 97.72% for malignant cytology.

Keywords: Fiber optic bronchoscopy, TB, sputum test

Introduction

In 1962, Shigeto Ikeda, a thoracic surgeon on staff at the National Cancer Center in Japan, recognized the potential for applying fiberoptic imaging to bronchoscopy. The prototype device, developed in 1964, underwent multiple revisions. The first useful instrument-comprising over 15,000 glass fibers-was presented at Copenhagen in 1966 [1].
After some modifications and adoption of a working channel, the Machida flexible bronchoscope became commercially available in 1968, which is now known as the year of the -second revolution‖ in bronchoscopy. Researchers further revised the bronchoscope to make it more maneuverable by adding a control mechanism to the tip that allows U-turn angulation for entry into the upper lobes [2]. The first Olympus model with better imaging and easy handing capabilities became commercially available in 1970. Ikeda was also instrumental in developing the first video bronchoscope by Asahi Pentax Corporation (1987). Today, video bronchoscopy is an integral part of the practice of chest medicine and is the basis for the

advances described later in this article. Today most ailments of the airways can be diagnosed, palliated, or cured by use of the flexible bronchoscope. Although removal of a foreign body from the endobronchial tree was the initial application for the rigid bronchoscope, today a majority of foreign bodies, even in the pediatric age group, are successfully removed with the flexible bronchoscope in a relatively noninvasive fashion [3, 4].

The flexible fiberoptic bronchoscope has continued to evolve since its introduction. The average adult bronchoscope has an external diameter of 4 to 6 mm and a typical viewing radius of 1200. The working channel for introduction of accessory instruments or suction is typically 1 to 3 mm in diameter. Ultrathin bronchoscopes for the evaluation of small distal airways are now available and have an external diameter of 2.7 mm. Another relatively new development is the videoscope that contains a video chip at the distal tip of the bronchoscope. These chips have a lower propensity for damage when compared with fiber bundles and also allow for digital processing of images. A wide variety of ancillary equipment may be used with the flexible fiberoptic bronchoscope, including biopsy forceps, protected and non-protected brushes for cytologic and microbiologic studies, and devices for transbronchial needle aspiration. Flexible bronchoscopy is usually performed with local anesthesia and may or may not require conscious sedation [5, 6].

Methodology
Source of data

The source of data for the study was from the patients attending Department of respiratory medicine both out patients and in patients.

Study period: One year.
Sample size: Intended to study a minimum of 50 cases.
Study design: Institutional based prospective study.
Place of study: All patients attending OPD & in patient at medical college satisfying inclusion & exclusion criteria were taken for the study.

Inclusion criteria

1. Patient consenting for the study.
2. Adult patients aged 18 and above.
3. Suspected patients of PTB (as per RNTCP guidelines).
4. Clinic radiological suspicion of malignancy.
5. Hemoptysis with localizing chest radiograph.
6. Chest x-ray showing non resolving pneumonia.
7. Chest x-ray with undiagnosed lung lesion.

Exclusion criteria

1. Patients not consenting for study.
2. Patients not fitting into inclusion criteria.
3. Patients who is a known or suspected case of HIV infection.
4. Patients with bleeding diathesis.
5. Patients with history of myocardial infarction, arrhythmias.
6. Patients on anti-tubercular therapy (ATT) for more than 1 month.

Methodology

1. Detailed recording of history.
2. Complete physical examination.
3. Investigations.

Results

Table 1: Age Distribution

Age	No. of Pt.	Percent
<20	1	2%
20-39	8	16%
40-59	30	60%
>60	11	22%

Of the 50 patients 36 (72%) were males and 14(28%) were females. The age group among the patients studied varied from 17 to 85 with mean age of 50.5 with a standard deviation of 15.1 and most of them falling into the age group of 40-59 years as depicted in table 1.

Table 2: Symptomatology

Sl. No.	Symptom	Number	Percent
1.	Cough	45	90%
2.	Breathlessness	32	64%
3.	Fever	30	60%
4.	Hemoptysis	18	36%
5.	Chest pain	4	8%
6.	Others	2	4%

Analysis of symptoms among patients, showed that cough was the most common symptom occurring in 45 patients (90%) and hemoptysis occurred in 10 patients (36%). Shortness of breath, fever and chest pain were seen in decreasing frequency in that order in 32 (64%) 30 (60%), 4(8%) respectively.

Table 3: Radiological Findings

Sl. No.	Symptom	Number	Percent
1.	Hilar adenopathy	2	4%
2.	Collapse	4	8%
3.	Fiberocavity	7	14%
4.	Mass	10	20%
5.	Normal	9	18%
6.	Pneumonia/Unresolved pneumonia	18	36%

Analysis of radiological findings among the 50 patients studied showed that pneumonia or unresolved pneumonia was the most common finding occurring in 18 (36%) patients. it was followed by radiological mass lesion in 10(10%) patients and 9 (18%) of patients had a normal or unremarkable chest X-ray, however fibrocavitary changes secondary Koch's were seen in 7(14%) patients, 4(8%) patients presented with collapse on chest X-ray and 2(4%)

patients had Hilar adenopathy on presentation.

Table 4: Prebronchoscopic Diagnosis

Sl. No.	Prebronchoscopic Diagnosis	Number	Percent
1.	Chronic cough	3	6%
2.	Hemoptysis	6	12%
3.	Sputum negative Koch's	20	40%
4.	Malignancy	21	42%

As seen from the above table, most of the bronchoscopies were done to confirm or rule out diagnosis of malignancy 21(42%) in our institute, followed by sputum negative pulmonary Koch's for obtaining samples for acid fast bacilli stain and mycobacterial culture which accounted for 20 (40%) patients. Other indications of bronchoscopy in our institute included, Hemoptysis 6(12%0 with no clinic-radiological data suggesting specific diagnosis, to identify cause and site of bleeding. Chornic cough 3(6%) with normal chest x-ray, which was refractory in nature to medical line of management.

Discussion

A total 50 patients were included in our study. The mean age of the population was 50.5 with standard deviation of 15.1. Males constituted the majority of the study population out numbering the female, 72v/s28 which is similar to most Indian & Western studies reviewed in literature.
Analysis of clinical profile of patients at presentation showed that cough was the most common symptom reported by 90% (45 patients) of the patients, 64% of the study group had breathlessness & fever was reported in 60% of the patient group. Hemoptysis 36% and chest pain 8% were next common symptoms in that order and 4% were other symptoms such as hoarseness of voice & wheeze which occurred very infrequently.
A study by Sinha et al. [7]. At All India Institute of Medical Science, New Delhi showed hemoptysis as the most common symptom (31.95%) in their study, followed by fever in 29.6%, chest pain in 20.7% & Anorexia in 6.7% of the cases. The occurrence of cough and breathlessness were not mentioned in their study. However in another study by Terrance W Barnes 8 the role of FOB in cases with chronic cough and normal or non-localizing chest x-ray, concluded that Bronchoscopy adds little to the diagnosis of Chronic cough & did not result in successful treatment alterations.
Nearly half of the patients 42% included in our study had a suspected diagnosis of malignancy & 40% had a prebronchoscopic diagnosis of sputum negative pulmonary Koch`s. A pre bronchoscopic diagnosis of hemoptysis with normal chest x ray was done in 12% of our patients. 3(6%) patients with chronic cough with non-localizing chest x ray were also included.
In a study by Sinha et al. [7] 45.7% of patients included had a suspected diagnosis of malignancy and 10% patients were included under suspected pulmonary Koch`s.
In the study by Prasoon Jain et al. [9] intial diagnosis were lung mass (48%), non-resolving pneumonia (18%) & hemoptysis (15%) in that order. In a study by Prakash USB the indications of bronchoscopy were pulmonary infiltrators in 17.87%, hemoptysis in 14.24%, mass lesion in 12.2%, hilar adenopathy in 10.9% pulmonary nodules in 10.7% diffuse infiltration in 7.7%, other diagnosis constituted 26.8%.
However in our study pre bronchoscopic diagnosis of pneumonia & or unresolved pneumonia occurred most frequently in 18(36%) patients, followed by lung mass in 10(20%) with adenopathy occurring in least number of patients 2 (4%).
Our indications and pre bronchoscopic diagnosis matches with most of the studies reported in

the literature [10].

Conclusion

- The most common symptom in our study was cough followed by breathlessness & fever.
- Unresolved pneumonia was the most common finding occurring in 18 (36%) patients.

References

1. Panchabhai TS, Mehta AC. Historical perspectives of bronchoscopy. Connecting the dots. Annals of the American Thoracic Society. 2015 May;12(5):631-41.
2. Jackson C. Bronchoscopy: past, present and future. N Engl. J Med. 1928;199:758-763.
3. Andersen HA, Fontana RS, Harrison EG, Jr. Transbronchoscopic lung biopsy in diffuse pulmonary disease. Dis Chest. 1965;48:187-192.
4. Ikeda S, Yanai N, Ishikawa S. Flexible bronchofiberscope. Keio J Med. 1968;17:1-16.
5. Garcia M. Beobachtungen ¨uber die menschliche Stimme. Vienna, Austria: W. Braunm¨uller, 1878.
6. Kirstein A. Autoskopie des Larynx und der Trachea (Besichtigung ohne Spiegel). Berliner Klin Wochenschr. 1895;22:476-478.
7. Sinha S, Guleria R, Pande JN, Pande RN, *et al*. Bronchoscopy in adults at tertiary care center: indications and complications. J Indian Med Assoc. 2004 Mar;102(3):152-4, 156.
8. Terrance W, Barnes MD, Bekele Afessa, MD, fccp *et al*. The cinical Utility of Flexible Bronchoscopy in the Evaluation of chronic cough; 9 CHEST. 2004;126:268-272.
9. Prasoon Jain, Sunder, *et al*. Role of flexible Bronchoscopy in Immunocompromised Patients with Lung Infiltrates (Chest.), 2004;125:712-722.
10. Michael S. Niederman, Bronchoscopy in Non resolving Nosocomial Pneumonia (Chest.). 200;117:212S-218S.
11. Willcox PA, Benatar SR, Potgieter PD. Use of the flexible fibreoptic bronchoscopy in the diagnosis of sputum negative pulmonary tuberculosis; Thorax. 1982;37:598-601.