

ORIGINAL ARTICLE

Diagnostic Yield of Fiber Optic Bronchoscopy (FOB) in Different Lung Diseases

Rafiqul Islam¹, Mahbub e Khuda², Rokeya Sultana³, Juwel Chowdhury⁴, MahmudulHasan Rassel⁵, Haripada Paul⁶, Ashrafuzzaman Khan⁷

Abstract:

Background and Aims: Fiber optic Bronchoscopy(FOB) is a safe, minimally invasive useful diagnostic &therapeutic tool for the management of pulmonary disease which can be performed on outpatient basis.The purpose of this study is to evaluate utility of FOB in the diagnosis of pulmonary disease & observe the clinical presentation, correlation with radiological finding & demographic characteristics of the patient in SSMC&MH.

Materials and Methods: A cross sectional study on 192 patients was done in SSMC &MH from January 2014 to July 2015 over 1 year. The commonest indication are radiological opacity (80.2%) followed by diffuse pulmonary lesion (9.3%).Cough was the commonest symptom seen in 75% patient. Among these patient 71.35% patients were smoker. Out of 192 patient who had undergone FOB.

Result: Majority are male (81.25%) & age over 60. The commonest finding of FOB are inflammatory lesion found in 51 patient(26.65%) followed by mass lesion in 41 patient(21.35%). Biopsy taken from 91 patient, malignancy was found in 35 patient(38.46%)followed by tuberculosis in 29 patient(31.86%). In bronchoalveolar lavage(BAL), malignancy was found in 37 patient despite of no growth in FOB. Majority patients didn't have any complication & very few patients had some minor complication.

Conclusion: Fiber optic bronchoscopy is a sophisticated investigation by which we can evaluation and diagnosis of variety of lung diseases, inflammatory lung diseases, bronchogenic carcinoma, tuberculosis with significant diagnostic accuracy.

[Chest Heart Journal 2018; 42(1) : 47-51]

DOI: <http://dx.doi.org/10.33316/chab.j.v42i1.2019577>

Introduction:

Bronchoscopy is an endoscopic technique of visualizing the airways for diagnostic and therapeutic purpose in both in patient and

outpatient services¹. Gustav Killian performed the first bronchoscopy for extraction of a piece of pork bone from the right main bronchus in 1897². FOB allows the physicians to explore the

1. Associate Professor of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.
2. Assistant Professor of Respiratory Medicine, National Institute of Diseases of the Chest & Hospital, Dhaka, Bangladesh.
3. Assistant Professor of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.
4. Registrar of Internal Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.
5. Assistant Registrar of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.
6. Registrar of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.
7. HMO, Registrar of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.

Correspondence to: Dr. Rafiqul Islam, Associate Professor of Respiratory Medicine, Sir Salimullah Medical College and Mitford Hospital, Dhaka, Bangladesh.

Submission on: 5 January 2018

Accepted for Publication: 25 January 2018

Available at <http://www.chabjournal.org>

tracheobronchial tree for abnormalities such as inflammation, tumors, external compression, bleeding, foreign bodies etc. TBB has a diagnostic yield of 40–90% in sarcoidosis³, 10–40% in Langerhans cell histiocytosis⁴, 88–97% in Pneumocystosis *jeroveci* pneumonia³⁻⁵. Therapeutic procedures include removal of bronchial secretion, foreign body, blood etc. Fiber optic bronchoscopy causes less discomfort than the rigid one and can be performed safely under local anesthesia and/or moderate sedation.

Materials and Methods:

All of the procedures were performed in bronchoscopy procedure suite of SSMC&MH with a flexible PENTAX EPK-1000 bronchoscope. Patients were required to fast up to at least 6 hours. At first 0.6 mg Atropine was given intramuscularly as induction. Liquid 2% xylocaine was administered on nasopharynx, oropharynx, vocal cord and bronchial tree. The whole procedure was done with the patient on supine position and in some cases on right or left lateral position if required. Flexible fiber optic Bronchoscope was introduced through trans-nasal route in most cases and oral route for the rests. Few patients were given injectable Midazolam when necessary. Oxygenation was monitored during and after procedures with pulse oxymetry and oxygen was administered via nasal cannula to maintain O₂ saturation > 90% if necessary. Bronchial brushing, bronchoalveolar lavage and bronchial biopsy were done as per international guideline and sent for analysis accordingly.

Results:

The analysis was performed in total of 192 patients who underwent fiber optic bronchoscopy. Among the 192 cases, the most common indication was localized radiological opacity, which was seen in 154 patients (80.2%). Others include diffuse pulmonary infiltrate (18 patients, 9.3%), haemoptysis with normal CXR findings (12 patients, 6.2%), unexplained symptoms e.g. persistent cough or shortness of breath, persistent non cardiac chest pain, foreign body (8 patients, 4.1%). [Table I]

Table-I
Indications of FOB

Indications	n (192)	%
Localized radiological Opacity ± effusion	154	80.2 %
Diffuse pulmonary infiltrate	18	9.3 %
Haemoptysis with normal CXR findings	12	6.2 %
Others	8	4.1 %

Out of 192 patients undergone the procedures and evaluated, 156 patients were male (81.25%) and 36 were females (18.75%). [Figure 1]

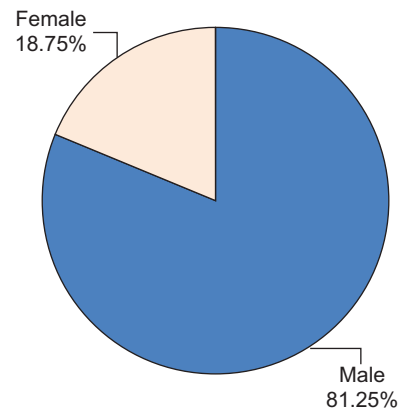


Fig-1: Sex Distribution

Most of our patients were between 51-60 years age group. The oldest is being 95 years and youngest being 19 years old. [Figure: 2]

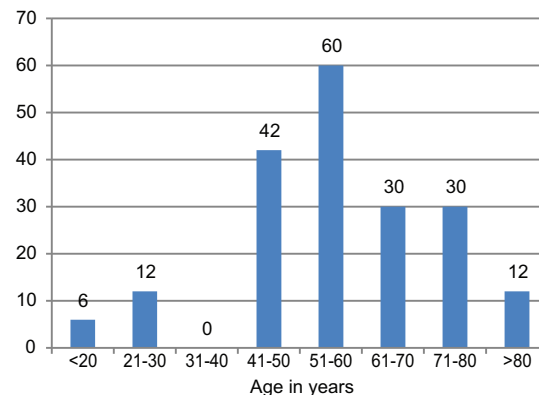


Fig-2: Age Distribution

Cough was the most common presenting symptom in 144 patients (75%), breathlessness in 66 (34.38%), haemoptysis in 60 (31.25%), non-cardiac chest pain in 24 (12.5%), hoarseness of voice in 18 (9.38%), fever in 48 (25%), expectoration in 36 patients (18.75%). [Table II]

Table-II
Clinical symptoms

Clinical symptoms	n (192)	%
Cough	144	75%
Breathlessness	66	34.38%
Haemoptysis	60	31.25%
Non cardiac chest pain	24	12.5%
Hoarseness of voice	18	9.38%
Fever	48	25%
Expectoration	36	36%

Out of 192 patients, 137 (71.35%) were smokers and the rest 55 (28.62%) were non-smokers. [Figure 3]

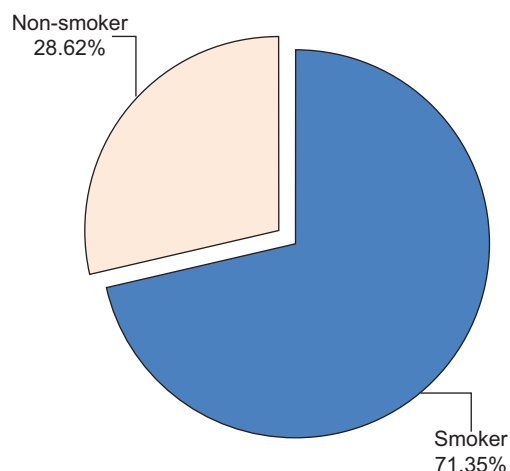


Fig.-3: Smoking history

The commonest radiological finding was consolidation, found in 61 patients (35.46%). Others consist of collapse in 33 (19.18%), Perihilar mass in 18 (10.46%), consolidation with effusion in 21 (12.2%), cavitation in 7 (4.06%), collapse with effusion in 14 (8.14%), diffuse pulmonary infiltrate in 18 patients (10.46%). [Table III]

Table-III
Radiological findings

Radiological findings	n (172)	%
Consolidation	61	35.46%
Collapse	33	19.18%
Perihilar mass	18	10.46%
Consolidation with effusion	21	12.2%
Cavitations	7	4.06%
Collapse with effusion	14	8.14%
Diffuse pulmonary infiltrate	18	10.46%

The commonest finding on the fiber optic bronchoscopy was inflammatory lesions, seen in 51 patients (46.68%), Endobronchial growth being the second, seen in 41 patients (37.5%). Bronchoscopy was inconclusive in 27 patients (14.06%), whereas in 56 patients (29.16%) it was normal. [Table IV]

Table-IV
Bronchoscopic findings

Bronchoscopic findings	n	%
Normal	56	29.16%
Inflammatory lesions	51	26.65%
Mass lesion	41	21.35%
Secretion	35	18.23%
Inconclusive	27	14.06%
External compression	1	0.52%
Multiple bleeding lesions	2	1.04%

Pathological examination of the specimens obtained by fiber optic bronchoscopy was performed subsequently.

On cytology, malignancy was seen in 37 patients, suspicious malignancy in 19 patients and inflammatory lesions in 49 patients. The cytology was normal in 87 patients.

On histopathological examination of 91 patients, malignancy was found on 35 (38.46%), non-specific inflammation in 16 (15.38%) and tuberculosis in 29 (31.86%), normal in 9 (9.8%) and inconclusive in 2 patients (2.1%). [Table V]

Table-V
Histological diagnosis

Histological diagnosis	n (91)	%
Normal	9	9.8%
Inconclusive	2	2.1%
Malignancy	35	38.46%
Tuberculosis	29	31.86%
Non-specific	16	17.58%

Minor bleeding during the procedure was commonest found in 48 patients (25%). Others include hypoxia in 18 (9.38%) and massive bleeding in 12 patients (6.25%). [Table VI]

Table-VI
Complications of bronchoscopy

Complications	n	%
No complication	126	65.63 %
Hypoxia	18	9.38 %
Minor bleeding	48	25 %
Bronchospasm	0	0 %
Pneumothorax	0	0 %
Bradycardia	0	0 %
Massive bleeding	12	6.25 %

Discussion:

Out of 192 patients undergone fiber optic bronchoscopy, majority consists of male (81.25%) and the majority of total patients are from age group of 51-60 years. There is a gradual increase of number of patients requiring bronchoscopy up to 60 years of age with a sharp fall in age group of 31-40 years. Then it decreased but remained static up to 80 years of age.

Cough was the commonest symptoms among the patients (75%) which is similar to a previously published study.

The most important indication for FOB was localized consolidation while others include effusion, unexplained haemoptysis, pleural effusion, collapse. Bronchogenic carcinoma was the more common with unexplained haemoptysis in this study. This is similar to other published studies⁶.

The most common finding in bronchoscopy was inflammatory lesions, found in 51 patients

(26.65%) followed by mass lesion found in 41 patients (21.35%). Study was found inconclusive in 27 patients (14.06 %).

Histopathological examination of biopsied sample revealed malignancy in 35 patients (38.46 %), followed by tuberculosis in 29 patients (31.86 %) which is prominent in surrounding areas. Some studies shows FOB being superior and minimally invasive for diagnosis of bronchogenic carcinoma.

Among the diagnosed cases of Bronchogenic carcinomas, non-squamous cell carcinoma was the commonest, found in 24 patients (68.57%) and rests were squamous cell carcinoma (31.43%). This was comparable with other studies conducted⁷⁻⁹.

All procedures including biopsy, bruising and bronchoalveolar lavage was attempted during the study to increase chances of accurate diagnostic evaluation. In few cases bronchoalveolar lavage and bruising smear can still establish diagnosis while biopsy is negative.

Although various anesthetic and instrumental complications have been reported during the procedure, 126 patients (65.63 %) experienced no complication. Minor bleeding was our commonest found in 48 patients (25%) followed by hypoxia in 12 patients (6.25%). Only a minor portion of our patients (6.25 %) suffered major bleeding. None experienced Bronchospasm, pneumothorax or Bradycardia where some other studies found pneumothorax as a main complication. Renal insufficiency (BUN >30mg/dL and creatinine of >3mg/dL), coagulopathies and pulmonary hypertension are considered the risk factors for bleeding following TBBx.

Limitation:

Due to lack of logistic support our study was restricted to diagnostic evaluation only. Moreover, we have no facility to perform transbronchial biopsy that's why we think that we might have missed some diagnosis particularly diffuse parenchymal lung lesion which might be major part of inconclusive patient.

Conclusion:

From our study, we can draw a conclusion that Fiber optic bronchoscopy is a sophisticated and user dependent but yet a safe and smart

instrument when it comes to the evaluation and diagnosis of variety of lung diseases with imaging, for example inflammatory lung diseases, Bronchogenic carcinoma, tuberculosis with significant diagnostic accuracy and also wide opens an array of investigation scopes like biopsy, cytology, culture and sensitivity with least invasiveness. This won't be much to say that it can be a base for further advanced opportunities in more minute evaluation of lung related disorders in the near future.

Reference:

1. Joos L, Patuto N, Chhajed PN, Tamm M. Diagnostic yield of flexible bronchoscopy in current clinical practice. *Swiss Med Wkly* 2006;136(9-10):155–9.
2. Venkateshiah SB, Mehta AC. Role of flexible bronchoscopy in the diagnosis of pulmonary tuberculosis in immunocompetent individuals. *J Bronchal* 2003;10:300–8.
3. Becker HD, Killian G: A Biographical Sketch. *J Bronchal*;1995; 2:77–83.
4. Prakash UBS, Offord KP, Stubbs SE. Bronchoscopy in North America: The ACCP survey. *Chest* 1991; 100: 1668-75.
5. Sawy MS, Jayakrishnan B, Behbehani N, Abal AT, El-Shamy A, Nair MG. Flexible fibreoptic bronchoscopy. Diagnostic yield. *Saudi Med J* 2004;25(10);1459–63.
6. Sawy MS, Jayakrishnan B, Behbehani N, Abal AT, El-Shamy A, Nair MG. Flexible fibreoptic bronchoscopy. Diagnostic yield. *Saudi Med J* 2004;25(10);1459–63.
7. Wahbah M. Changing trends in the distribution of the histologic types of lung cancer: a review of 4,439 cases. *Ann Diagn Pathol* 2007; 11: 89.
8. Hernández Blasco L, Sánchez Hernández IM, Villena Garrido V, de Miguel Poch E, Nuñez Delgado M, Alfaro Abreu J. Safety of transbronchial biopsy in outpatients. *Chest* 1991;99:562–5.
9. Wahidi MM, Rocha AT, Hollingsworth JW, Govert JA, Feller-Kopman D, Ernst A. Contraindications and safety of the transbronchial lung biopsy via flexible bronchoscopy. A survey of pulmonologists and review of the literature. *Respiration* 2005;72;285–95.