



EVALUATION OF LUNG DISEASES WITH BRONCHOSCOPY

Pulmonary Medicine

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ABSTRACT

Background Bronchoscopy is the diagnostic inspection of the tracheobronchial tree. Gustav Killian performed the first bronchoscopy in 1897. In 1966, first flexible bronchoscope was introduced by Shigeto Ikeda(1,2). Since then, the flexible bronchoscope has revolutionized the field of bronchoscopy and became the standardized instrument for diagnosis by the pulmonologists. It is an important advancement in the field of respiratory medicine, particularly for the investigation of haemoptysis or radiological appearances, such as atelectasis or non-resolving opacities. Many diagnostic procedures can be performed using flexible bronchoscopy (FB), such as airway inspection, bronchoalveolar lavage (BAL), bronchial brushing, endobronchial biopsy, TBLB, and conventional transbronchial needle aspiration (TBNA)(3). Flexible bronchoscopy is usually recommended for the diagnosis and staging of lung cancer, diagnosis of respiratory tract infections (both in immunocompetent and immunocompromised patients) and of interstitial lung diseases. Furthermore, its use is required for patients with hemoptysis, with unexplained cough and stridor/wheezing, and staging of thoracic malignancies.(5-10). Bronchoscopic procedures comprehensively assess endobronchial abnormalities (e.g., airway stenosis, bleeding, secretions, etc.) and frequently are adopted to collect specimens for microbiological and/or pathological exams(4,5). **Aim** Evaluation Of Lung Diseases With Bronchoscopy. **Materials And Methods** Retrospective observational study of 86 patients who are admitted in department of pulmonary medicine and age > 18 years .Data regarding detailed history , general and systemic examinations smoking habits and other risk factors are collected and analysed. Bronchoscopy procedure done in patients with no improvement ,undiagnosed diseases with suspicious of tuberculosis with sputum negative and suspicious of malignancy. **Results and conclusions** Bronchoscopic visualisation showed normal findings in 51 patients, 18 patients with hyperemia, secretions are present in 13 patients, endobronchial bleed in 2 patients and in 2 patients stenosis of bronchi is observed. BAL positive for MTB in 10 patients with Rifampicin sensitive in 8 patients and 2 patients are Rifampicin resistant. In 21 patients of BAL culture microorganisms got isolated with 6 klebsiella, 7 pseudomonas, 4 streptococcus, 2 enterococcus, 1 MRSA and 1 E.coli. So, bronchoscopy is a safe procedure which helps in the diagnosis of pulmonary diseases and their management.

KEYWORDS

flexible bronchoscopy (FB), Mycobacterium tuberculosis (MTB), Broncho Alveolar Lavage (BAL).

INTRODUCTION

Bronchoscopy is the diagnostic inspection of the tracheobronchial tree. Gustav Killian performed the first bronchoscopy in 1897. In 1966, first flexible bronchoscope was introduced by Shigeto Ikeda^(1,2). Since then, the flexible bronchoscope has revolutionized the field of bronchoscopy and became the standardized instrument for diagnosis by the pulmonologists. It is an important advancement in the field of respiratory medicine, particularly for the investigation of haemoptysis or radiological appearances, such as atelectasis or non-resolving opacities

Many diagnostic procedures can be performed using flexible bronchoscopy (FB), such as airway inspection, bronchoalveolar lavage (BAL), bronchial brushing, endobronchial biopsy, TBLB, and conventional transbronchial needle aspiration (TBNA)⁽³⁾. Flexible bronchoscopy is usually recommended for the diagnosis and staging of lung cancer, diagnosis of respiratory tract infections (both in immunocompetent and immunocompromised patients) and of interstitial lung diseases. Furthermore, its use is required for patients with hemoptysis, with unexplained cough and stridor/wheezing, and staging of thoracic malignancies⁽⁴⁻¹⁰⁾.

Flexible bronchoscopy, performed under conscious sedation and with topical anesthesia, is safe in all age groups, including the elderly, with serious complications and mortality occurring in 1.1% and 0.04% of the cases, respectively^(4,5,11).

Bronchoscopic procedures comprehensively assess endobronchial abnormalities (e.g., airway stenosis, bleeding, secretions, etc.) and frequently are adopted to collect specimens for microbiological and/or pathological exams^(4,5).

AIM:

Evaluation Of Lung Diseases With Bronchoscopy

METHODS:

It is a retrospective observational study, approved by the institutional ethics committee (IEC).

The study was conducted in our Department of Pulmonary Medicine from January 2021 to December 2022.

Sample size: 86

At the baseline, sociodemographic details were obtained, a detailed history was taken, and a clinical examination was done.

Inclusion criteria:

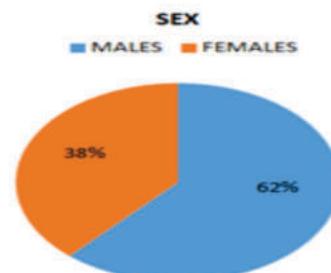
- age > 18 years
- sputum negative for Mycobacterium tuberculosis

Exclusion criteria:

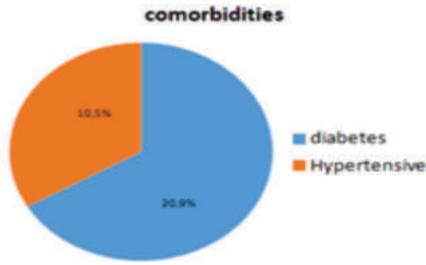
- Who didn't give consent
- Saturation < 90%
- Haemodynamically unstable are excluded

RESULTS:

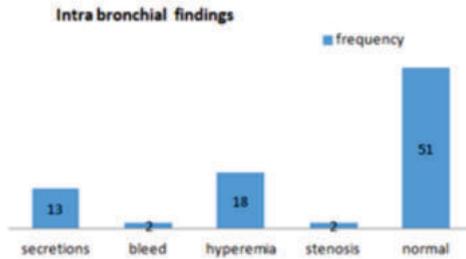
Out of 86 patients, 53 (62%) are males and 33 (38%) are females with youngest individual ages 18 years and oldest patient with 85 years.



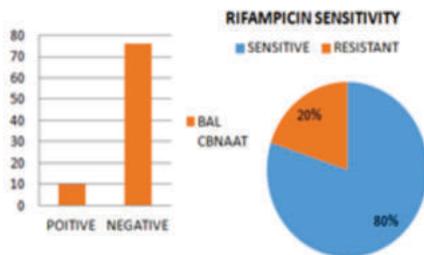
Out of 86, 27 patients are with comorbidities (diabetes, hypertension) of which 18 are diabetes and 9 are hypertensive.



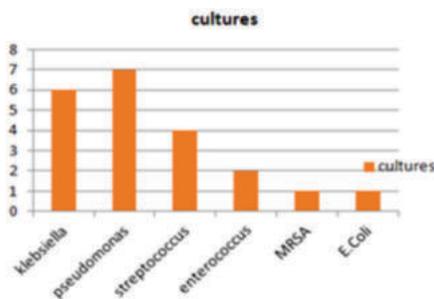
Bronchoscopic visualisation showed normal findings in 51 patients, 18 patients with hyperemia, secretions are present in 13 patients, endobronchial bleed in 2 patients and in 2 patients stenosis of bronchi is observed.



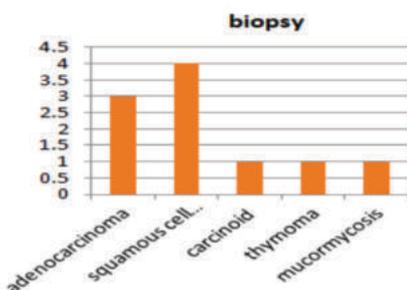
Bronchoalveolar lavage taken from all patients, of which BAL positive for MTB in 10 patients with Rifampicin sensitive in 8 patients and 2 patients are Rifampicin resistant.



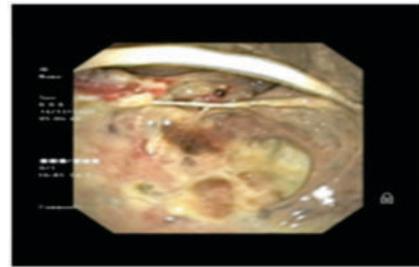
In 21 patients of BAL culture microorganisms got isolated with 6 klebsiella, 7 pseudomonas, 4 streptococcus, 2 enterococcus, 1 MRSA and 1 E.coli.



In 10 patients biopsies taken, reports showed malignancies with 3 adenocarcinoma, 4 squamous cell carcinoma, 1 carcinoid and 1 thymoma and 1 mucormycosis.



Lung abscess



Endobronchial mass



DISCUSSION

In current study, 86 patients underwent bronchoscopic procedure with male 53 (62%) and females 33 (38%) with age ranges from 18 years to 85 years. In a study by Sinha et al⁽¹²⁾ the males constituted 332 (75.1%) of cases and females 107 (24.9%) with aged between 12 and 89 years.

In a study by Ravindran et al⁽¹³⁾ 86% were male patients and 14% were female patients and the combined yield of bronchoscopy with procedures such as BAL, bronchial biopsies, bronchial wash and post-bronchoscopy sputum, in patients with negative sputum smears is reported to be 11.6%. A study by Singhal et al⁽¹⁴⁾ showed the overall diagnostic yield of 62.7% (23/43). Aggarwal et al⁽¹⁵⁾ reported in 19 smear-negative suspected pulmonary tuberculosis patients undergoing bronchoscopy. Kalawat et al⁽¹⁶⁾ in their study Overall diagnosis could be established in 86.6% of patients with the help of fiber optic bronchoscopy.

In this study BAL cultures reported positive in 21 (24%) patients out of 86 patients with MRSA (1), pseudomonas (7), enterococcus (2) streptococcus (4) klebsiella (6), e.coli (1).

In a similar study, Kim ES et al⁽¹⁷⁾ positive BAL culture was documented in 18 (5.29%) patients with MRSA (1), pseudomonas (3), enterococcus (1) streptococcus (2) e.coli (1) are reported.

In this study, biopsy taken from vocal cords, endobronchial and tranbronchially in 19 patients which results in positive in 10 patients (52.63%). In a study S. A. Ensminger et al⁽¹⁸⁾ 651 bronchoscopic biopsy procedure done with positive findings in 494 (75.9%). In a study Kumar et al⁽¹⁹⁾ diagnostic yield is around 64.5%. In this study, biopsy confirmed malignancies 3 (30%) adenocarcinoma, 4 (40%) squamous cell carcinoma, 1 (10%) carcinoid and 1 (10%) thymoma and 1 (10%) mucormycosis. In Kumar et al⁽¹⁹⁾, confirmed 70 patients of malignancy, squamous cell carcinoma in 38 (54.28%), adenocarcinoma in 10 (14.28%) and small cell carcinoma in 20 (28.57%) patients.

CONCLUSION

Bronchoscopy, which has an increased diagnostic yield, and minimal risk associated with the procedures, will remain crucial in the evaluation of bronchopulmonary diseases and provide safe and effective approaches to tissue sampling.

REFERENCES

1. Becker HD. Gustav Killian e a biographical sketch. J Bronchol. 1995;2:77e83.
2. Ikeda S, Yanai N. Flexible fibrebronchoscope. Kejo J Med. 1968;17:1e16
3. Gupta AA, Sehgal IS, Dhooria S, Singh N, Aggarwal AN, Gupta D, et al. Indications for performing flexible bronchoscopy: trends over 34 years at a tertiary care hospital. Lung India. 2015; 32:211-5.
4. Du Rand IA, Blaikley J, Booton R, Chaudhuri N, Gupta V, Khalid S, et al. British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults. Thorax. 2013;68.

5. Ninan N, Wahidi MM. Basic bronchoscopy: Technology, techniques, and professional fees. *Chest*. 2019;155(5):1067-74.
6. Gasparini S. Indications for diagnostic bronchoscopy in adults. *Monaldi Arch Chest Dis - Pulm Ser*. 2011;75(1):24-31
7. Mondoni M, Carlucci P, Cipolla G, Fois A, Gasparini S, Marani S, et al. Bronchoscopy in patients with hemoptysis and negative imaging tests. *Chest*. 2018;153(6):1510-1.
8. Mondoni M, Carlucci P, Cipolla G, Fois A, Gasparini S, Marani S, et al. Bronchoscopy to assess patients with hemoptysis: Which is the optimal timing *BMC Pulm Med*. 2019; 19(1):1-6.
9. Mondoni M, Carlucci P, Job S, Parazzini EM, Cipolla G, Pagani M, et al. Observational, multicentre study on the epidemiology of haemoptysis. *Eur Respir J*. 2018;51(1):10-3.
10. Mondoni M, Papa GFS, Sotgiu G, Carlucci P, Pellegrino GM, Centanni S. Haemoptysis: A frequent diagnostic challenge. *Eur Respir J*. 2016;47(1):348---50.
11. Mondoni M, Radovanovic D, Sotgiu G, Di Marco F, Carlucci P, Centanni S, et al. Interventional pulmonology techniques in elderly patients with comorbidities. *Eur J Intern Med*. 2019;59(September 2018):14-20.
12. Sinha S, Guleria R, Pande JN, Pandey RM. Bronchoscopy in adults at a tertiary care centre: indications and complications. *J Indian Med Assoc*. 2004;102:152e154.
13. Anandan PT, Rajagopal TP, James PT, Ravindran C. Clinical profile of patients undergoing fiberoptic bronchoscopy in a tertiary care setting. *Indian J Bronchology*. 2006;1:58e68.
14. Singhal S, Gaidhane AM, Khatib N, et al. Use of flexible bronchoscopy for rapid diagnosis of suspected tubercular cases in rural India. *J Infect Dev Ctries*. 2009;3: 860e864.
15. Aggarwal P, Kumar R. Diagnostic yield of induced sputum and bronchoscopy in sputum smear negative pulmonary tuberculosis. *Respirology*. 2007;12:A240.
16. Kalawat U, Sharma KK, Reddy PN, Kumar AG. Study of bronchoalveolar lavage in clinically and radiologically suspected cases of pulmonary tuberculosis. *Lung India*. 2010;27:122e124.
17. Kim ES, Kim EC, Lee SM, Yang SC, Yoo CG, Kim YW, Han SK, Yim JJ. Bacterial yield from quantitative cultures of bronchoalveolar lavage fluid in patients with pneumonia on antimicrobial therapy. *Korean J Intern Med*. 2012 Jun;27(2):156-62.
18. Ensminger, S. A.; Prakash, U. B. S. (2006). *Is bronchoscopic lung biopsy helpful in the management of patients with diffuse lung disease?*. *European Respiratory Journal*, 28(6), 1081–1084.
19. Kumar, Raj; Gupta, Nitesh (2015). *Role of bronchoscopy in evaluation of cases with sputum smear negative pulmonary tuberculosis, interstitial lung disease and lung malignancy: A retrospective study of 712 cases*. *Indian Journal of Tuberculosis*, 62(1), 36–42.