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Original Research Article

Diagnostic bronchoscopy: an experience in a hospital of limited resources

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ABSTRACT

Background: Diagnostic bronchoscopy is conventionally performed in evaluating undiagnosed abnormal chest x-ray findings, undiagnosed haemoptysis, pleural effusion, unexplained cough and collapse of lung etc. One indispensable use currently is for diagnosis of lung cancer. The aim of the study was to study the various types of patients who have undergone Diagnostic Bronchoscopy in a hospital of limited resources and the diagnostic outcomes of the procedures.
Methods: A retrospective study of Bronchoscopies was done from October 2016 to January 2018, in Department of Respiratory Medicine in the hospital of a Medical College. All 178 patients of all age and any sex were included in the study. These patients present in the study had chest X-ray and CT scan of thorax. Other investigations done were ZN stains for AFB and CBNAAT-TB (Cartridge Based Nucleic Acid Amplification Test) for sputum and blood complete haemogram, prior to bronchoscopy.
Results: Our study has shown that Diagnostic bronchoscopy is particularly useful in diagnosis of lung cancer, sputum smear negative Tuberculosis, if proper selection of cases is done even in a centre of limited resources. It has become an absolute necessity in a medical college hospital.
Conclusions: Bronchoscopy in our resource limited set up shows that it is an indispensable tool for diagnosis of lung cancer with patients with clinical presentations of lung collapse, unresolved consolidation, lung masses, undiagnosed pleural effusions and haemoptysis. The usefulness can be much better if facilities like TBNA, EBUS are made available.

Keywords: Bronchoscopy, Bronchoalveolar lavage, Diagnostic bronchoscopy

INTRODUCTION

Bronchoscopy has been a procedure widely used in diagnostic and therapeutic process of various lung disorders. Various developments have taken place in the field of bronchoscopy since the development of flexible bronchoscopy by Ikeda et al. Finer scopes and higher resolutions have been developed in the recent years.[1] Fluorescent bronchoscopy, EBUS (Endobronchial ultrasound) and EBUS-TBNA (Transbroncheal needle aspiration), in addition to conventional direct vision biopsy, BAL (Bronchoalveolar Lavage) study, has become essential measures enhancing diagnostic yields, in better equipped hospitals.[2] However, routine viewing of tracheobronchial tree, bronchial washings, BAL and direct vision biopsy are still of immense usefulness in a resource limited hospital like authors' in a remote area.

The diagnostic bronchoscopy is recommended in unexplained prolonged cough, wheezing in non-asthmatics or in asthmatics poorly responding to conventional treatment.[3,4] Some cases of stridor or vocal

cord paralysis caused by intrathoracic lesions lower down may also necessitate further study by bronchoscopy. Patients with haemoptysis which is persistent or brisk and large in volume, besides cases with high suspicion for lung cancer will also get benefitted immensely by this procedure.[5] Non-resolving pneumonia cases should also undergo bronchoscopy.[6] Cavitary chest lesions or lung abscesses may sometimes turn out to be caused by lung cancer or sometimes co-existence of lung cancer with chronic scarring disease like Tuberculosis.[7] Diagnostic bronchoscopy is also indicated in collapse lung cases as the cause may be endobronchial growth.[8] Cases of undiagnosed persistent pleural effusion may be advised for bronchoscopy as these cases have high chance of malignancy.[9,10] Lung nodules, lung masses and hilar adenopathy also warrant further evaluation by bronchoscopy.[11,12]

India is still having high prevalence of Tuberculosis cases including multi-drug resistant forms and extensively drug resistance. BAL study for ZN Acid Fast Bacilli and CBNAAT-TB is very useful for detecting sputum smear negative Tuberculosis and multi drug resistant cases.[13]

Trans-bronchial needle aspiration (TBNA) especially aided by Endobronchial ultrasound (EBUS), popularly known as EBUS-TBNA definitely helps a bronchoscopist in diagnosing submucosal lesions or lesions causing extrinsic compressions of the bronchus and mediastinal lymph nodes.[14] This process also is useful for lung cancer staging.[15] EBUS-TBNA definitely increases the diagnostic yield more than forceps biopsy alone for mucosal lesions and intraluminal growths under direct vision.[16] However, in our resource limited centre without EBUS-TBNA facility still is very useful for diagnosis of diseases like lung cancer and Smear or CBNAAT negative tuberculosis. Common procedures in this centre in bronchoscopy are bronchoalveolar lavage, bronchial washing, bronchial brushings and forceps biopsy of mucosal and intraluminal lesions.

In many modern bronchoscopy centres, usefulness is significant for evaluation for diagnosis in sarcoidosis and interstitial lung diseases.

The type of clinical illnesses referred for Bronchoscopy and selected for bronchoscopy in a set up like ours is different from what is experienced in larger cities of India and developed countries of the world.

Aim of the study was to study clinical presentations of patients who had undergone bronchoscopy in the hospital and the diagnosis observed after bronchoscopy in each case, retrospectively.

METHODS

A retrospective analysis of all the bronchoscopy procedures was done in the Hospital from October 2016 to January 2018. The brief salient clinical presentations recorded in the Bronchoscopy Register were studied with post-bronchoscopy reports mentioned against each case.

All the procedures were done after proper selection by studying the clinical features, pleural fluid analysis reports for patients having pleural effusions, sputum for Acid Fast Bacilli, sputum for CBNAAT-TB and radiological findings like chest x-ray and CT- scan.

All the bronchoscopy procedures were performed with patient in supine position, with Xylocaine as topical anaesthesia, 10% Xylocaine spray for the upper airways, 5% Xylocaine ointment for the nostril just before the introduction of Bronchoscopy and 4% Xylocaine spurts through working channel on ‘as you go basis’ at the entry of vocal cords, carina, as per American College of Chest Physicians Consensus Statement.[18] No sedation or atropine injection were used the procedures. Vital signs like pulse rate, blood pressure and SaO_2 (arterial oxygen saturation) were monitored while the bronchoscopy was performed. Informed consent was obtained for each patient prior to the procedures. During bronchoscopy, observation of airways, bronchial washings, Bronchoalveolar lavage and forceps biopsy of affected lesions were done, while video recording of the whole procedures were done.

RESULTS

All the records of bronchoscopy procedures, clinical profiles and reports for the 178 patients from October 2016 to January 2018, recorded in the bronchoscopy register were studied retrospectively.

Among the 178 patients who had bronchoscopy done, 91 were males and 87 were females and all belong to age of 21 to 89 years of age.

Table 1: Clinical profiles of patients for which bronchoscopy were done (n=178).

Clinical condition	n (%)
Collapse lung	42 (23.6)
Un-resolving consolidation	51 (28.7)
Lung mass	70 (39.3)
Undiagnosed pleural effusion	8 (4.5)
Undiagnosed haemoptysis	7 (3.9)

Out of the patients (n=42) having collapse lung, 9 (21.4%) have been reported having lung cancer alone, 1(2.4%) as Tuberculosis, 1 (2.4%) as having lung cancer with TB and remaining 24 (57.1%) as Inflammation/inconclusive and 7 (16.7%) as inadequate sample. Among 51 un-resolving consolidation cases 2 (3.9%) were reported to be having lung cancer, 5(9.8%) as Tuberculosis, 5 (9.8%) as Pneumonia, 2(3.9%) as Lung cancer with TB and 37 (72.5%) as Inflammation/inconclusive. 14 (20%) cases are reported as having lung cancer, 2 (2.9%) as pneumonia, 1 (1.4%)

as tuberculosis and 53 (75.7%) as inflammation/inconclusive, among the total of all lung mass presentations (n=70). In the group of cases of undiagnosed Pleural effusion (n=8), 2 (25%) turned out to be of lung cancer (adenocarcinoma) in report and 6(75%) as Inflammation/inconclusive. The bronchoscopy reports of the undiagnosed haemoptysis cases (n=7) were 1 (14.2%) pneumonia, 1 (14.2%) tuberculosis, 1(14.2%) lung cancer and remaining 4 (57%) Inflammation/inconclusive reports.

Table 2: Bronchoscopy reports (n=178).

Reports	n (%)
Lung cancer alone	28 (15.7)
Tuberculosis	8 (4.5)
Lung cancer with tuberculosis	3 (1.7)
Inflammation /inconclusive	124 (69.7)
Pneumonia	8 (4.5)
Sample inadequate	7 (3.9)

Among the 17 patients diagnosed with Adenocarcinoma, 10 were male and 7 were female patients. Seven were males and 5 were females in the reports of Squamous cell carcinoma group. All the 2 patients diagnosed with Small cell carcinoma were males.

Table 3: Types of lung cancer in reports (n=31).

Type of lung cancer	n (%)
Adenocarcinoma	17 (54.8)
Squamous cell carcinoma	12 (38.7)
Small cell carcinoma	2 (6.5)

Among the patients diagnosed as having lung cancer, 1 (3.6%) patient had undergone bronchoscopy twice after an interval of 1 month as the first procedure did not result in any conclusion, but the clinical feature was strongly suggestive of lung cancer and it was decided to have a repeat Bronchoscopy.

DISCUSSION

Bronchoscopy has become a necessity in every hospital having Department of Pulmonary Medicine and it is no longer a luxury.[18] In this retrospective study clinical conditions with suspicion of malignancy like collapse lung, non-resolving consolidation on radiological investigation, undiagnosed pleural effusion and haemoptysis are the main indications for Bronchoscopy. Conditions like collapse lung is having higher yield in bronchoscopy for lung cancer, getting 21.4% yield among all the cases of lung collapse, which was caused by intraluminal growth of lung cancer. Fein AM et al, reported 12 out of 14 (86%) patients having diagnostic yield in patients of non-resolving pneumonia, which higher than finding in present study, although number of patients is higher in the present study.[19]

In more advanced centres with better resources, TBNA (Trans bronchial Needle Aspiration) for diagnosis of sarcoidosis with combination of EBUS (Endobronchial Ultrasound) is having higher sensibility.[20] In another study commonest indications were haemoptysis and bronchogenic carcinoma followed by pulmonary infection and sarcoidosis.[21] BAL is very useful as observed in this study, as a tool for detection of sputum smear negative Tuberculosis, as observed in other studies.[22,23] Authors have subjected the BAL samples for CBNAAT-TB study, which had helped in finding Tuberculosis existing with lung cancer. The yield of Tuberculosis from BAL study was 5 (2.8%) out of total Bronchoscopy cases (n=178), as all the cases were already screened by sputum CBNAAT-TB and got negative in the said test except one, hence being lesser from other studies showing yields in 48-73%.[24,25] Coexistence of TB with lung cancer was observed in 3 (1.7%) cases out of total bronchoscopies (n=178) in present study, which is similar to one study.[26]

BAL, bronchial brushing, bronchial washing and forceps biopsy under direct vision helped in the yield for detection of lung cancer in the present study, the yield was observed in 31 (17.4%) cases out of total bronchoscopy cases (n=178). The yield was 31.11% in one study and upto 11% in another study by Johnson JL et al.[27,28]

CONCLUSION

Bronchoscopy in a resource limited set up shows that it is an indispensable tool for diagnosis of lung cancer with patients with clinical presentations of lung collapse, unresolved consolidation, lung masses, undiagnosed pleural effusions and haemoptysis. The usefulness can be better if facilities like TBNA, EBUS are made available, for detection of other respiratory diseases. It is of great help in diagnosis of sputum smear negative and even sputum CBNAAT-TB negative tuberculosis. It is the experience and wisdom of the treating physician to suspect TB in diagnosed lung cancer cases and lung cancer in established pulmonary tuberculosis cases, leading to subjecting these cases judiciously to procedure of bronchoscopy.

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REFERENCES

1. Noriaki Kurimoto and Teruomi Miyazawa. Flexible Bronchoscopy. 3rd Edition. Wiley Blackwell. Chapter 1, Bronchoscopy in the New Millennium. 2012:3.
2. Ong PG, Debiane LG, Casal RF. Recent advances in diagnostic bronchoscopy. J Thoracic Dis. 2016 Dec; 8(12):3808.

3. Decalmer S, Woodcock A, Greaves M, Howe M, Smith J. Airway abnormalities at flexible bronchoscopy in patients with chronic cough. Eur Resp J. 2007 Dec 1 ;30(6):1138-42.
4. Mehra PK, Woessner KM. Dyspnea, wheezing, and airways obstruction: is it asthma? Allergy Asthma Proc. 2005 Jul-Aug;26(4):319-22.
5. Smiddy JF, Elliot RC. The evaluation of hemoptysis with fiberoptic bronchoscopy. Chest. 1973 Aug; 64(2):158-62.
6. Feinsilver SH, Fein AM, Niederman MS, Schultz DE, Faegenburg DH. Utility of fiberoptic bronchoscopy in nonresolving pneumonia. Chest. 1990 Dec; 98(6):1322-6.
7. Sosenko A, Glassroth J. Fiberoptic bronchoscopy in the evaluation of lung abscesses. Chest. 1985;87(4):489-94.
8. Su WJ, Lee PY, Perng RP. Chest roentgenographic guidelines in the selection of patients for fiberoptic bronchoscopy. Chest. 1993 Apr; 103(4):1198-201.
9. Gunnels JJ. Perplexing pleural effusion. Chest. 1978 Oct; 74(4):390-3.
10. Chang SC, Perng RP. The role of fiberoptic bronchoscopy in evaluating the causes of pleural effusions. Arch Intern Med. 1989;149(4): 855-7.
11. Baaklini WA, Reinoso MA, Gorin AB, Sharafkaneh A, Manian P. Diagnostic yield of fiberoptic bronchoscopy in evaluating solitary pulmonary nodules. Chest. 2000 Apr; 114(4):1049-54.
12. Prakash UBS, Stubbs SE. Bronchoscopy in North America: the ACCP survey. Chest. 1991 Dec;100(6):1668-75.
13. Khalil KF, Butt T. Diagnostic yield of bronchoalveolar lavage gene Xpert in smear-negative and sputum-scarce pulmonary tuberculosis. J Coll Physicians Surg Pak. 2015 Feb 1;25(2):115-8.
14. Gay PC, Bruntinel WM. Transbronchial needle aspiration in the practice of bronchoscopy. Mayo Clin Proc. 1989 Feb; 64(2):158-62.
15. Harrow E, Halber M, Hardy S, Halteman W. Bronchoscopic and roentgenographic correlates of a positive transbronchial needle aspiration in the staging of lung cancer. Chest. 1991 Dec 1;100(6):1592-6.
16. Dasgupta A, Jain P, Minai OA, Sandur S, Meli Y, Arroliga AC, et al. Utility of transbronchial needle aspiration in the diagnosis of endobronchial lesions. Chest. 1999 May 1;115(5):1237-41.
17. Wahidi MM, Jain P, Jantz M, Lee P, Mackensen GB, Barbour SY, et al. American college of chest physicians consensus statement on the use of topical anesthesia, analgesia, and sedation during flexible bronchoscopy in adult patients. Chest. 2011;140(5):1342-50.
18. Vaidya PJ, Leuppi JD, Chhajed PN. The evolution of flexible bronchoscopy: From historical luxury to utter necessity. Lung India: official organ of Indian Chest Society. 2015 May;32(3):208.
19. Fein AM, Feinsilver SH. The approach to non-resolving pneumonia in the elderly. Semin Respir Infect. 1993 March; 8(1):59-72.
20. Vaidya PJ, Kate AH, Chhajed PN. Endobronchial ultrasound-guided transbronchial needle aspiration: The standard of care for evaluation of mediastinal and hilar lymphadenopathy. J Cancer Res Ther. 2013;9:549-51.
21. 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: official organ of Indian Chest Society. 2015 May;32(3):211.
22. Kumar R, Singh M, Gupta N, Goel N. Bronchoscopy in immediate diagnosis of smear negative tuberculosis. Pneumonol Alergol Pol. 2014;82(5):410-4.
23. Tueller C, Chhajed PN, Buitrago-Tellez C, Frei R, Frey M, Tamm M. Value of smear and PCR in bronchoalveolar lavage fluid in culture positive pulmonary tuberculosis. Eur Respir J. 2005 Nov; 26(5):767-72.
24. Bachh AA, Gupta R, Haq I, Varudkar HG. Diagnosing sputum/smear-negative pulmonary tuberculosis: does fibre-optic bronchoscopy play a significant role?. Lung India: official organ of Indian Chest Society. 2010 Apr;27(2):58.
25. Chawla R, Pant K, Jaggi OP, Chandrashekhar S, Thukral SS. Fibreoptic bronchoscopy in smear-negative pulmonary tuberculosis. Eur Resp J. 1988 Oct 1;1(9):804-6.
26. Tamura A, Hebisawa K, Tanaka G, Tatsuta H, Tsuboi T, Nagai H, et al. Active pulmonary tuberculosis in patients with lung cancer. Kekkaku. 1999 Nov; 74(11):797-802.
27. Bhadke B, Munje R, Mahadani J, Surjushe A, Jalgaonkar P. Utility of fiberoptic bronchoscopy in diagnosis of various lung conditions: Our experience at rural medical college. Lung India: official organ of Indian Chest Society. 2010 Jul;27(3):118.
28. Johnson JL. Slowly resolving and nonresolving pneumonia: questions to ask when response is delayed. Postgraduate Med. 2000 Nov 1;108(6):115-22.

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