



Original Research Article

Spectrum of Bronchoscopy at Tertiary Care Hospital at Jaipur in Rajasthan

Authors

Mahesh K Mishra, Lokesh Maan*, V K Jain

Department of Respiratory medicine, Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan, India

*Corresponding Author

Dr Lokesh Maan M.D.

Assistant Professor- Department of Respiratory Medicine, Mahatma Gandhi Medical College & Hospital, Jaipur (Rajasthan) 302022, India

Email: drlokeshmaan@gmail.com, Contact no, 08875547660

Abstract

Introduction: Era of bronchoscopy began when German laryngologist Gustav Killan in 1876 and flexible fibro optic bronchoscope was introduced by Ikada in 1964. Bronchoscope has become an important diagnostic as well as therapeutic tool for management of chest diseases and revolutionized the practice of pulmonary medicine. The indications of bronchoscopy are numerous diagnostic as well as therapeutic on the basis of underlying pulmonary diseases.

Material & Method: This study is retrospective analysis of 200 bronchoscopies which were carried out over period of October 2016 to November 2017 at Mahatma Gandhi Hospital, Jaipur.

Result: Diagnostic bronchoscopy done in 154 cases. Malignancy was confirmed in 88(68%) out of 130 suspected cases, while tuberculosis was confirmed in 7(54%) out 13 presumptive pulmonary tuberculosis. Bronchial biopsy was positive in 68% while bronchial brush was positive 51%. Histopathological profile of malignancy was dominated by squamous cell carcinoma 64, small cell carcinoma 11, adenocarcinoma 8 and rest of 5 were other rare type. Gene Xpert of bronchial lavage was positive for tuberculosis in 7 out of 13 cases of presumptive pulmonary tuberculosis. Therapeutic bronchoscopy was performed in 46 cases. Majority of therapeutic bronchoscopy done for collapsed lung (n=41) and 93% were successfully expanded after procedure. Two cases of tracheal stenosis were successfully dilated by repeated balloon dilatation. Life threatening central airway obstruction by known endobronchial malignant lesion were made patent by putting self expandable metallic stent in 2 cases. Foreign body (tooth) was removed in one patient from right intermedius bronchus.

Conclusion: Conventional bronchooscopy still remain useful and safe tool for various pulmonary disorders like carcinoma lung, tuberculosis, pneumonia.

Keywords: bronchoscopy, diagnostic, therapeutic, hemoptysis.

Background

Bronchoscope is well established entity in the field of medicine for diagnosis and therapeutic uses of various respiratory diseases. Over the period of time bronchoscope is evolved and era of

newer generation bronchoscope like EBUS has began. But conventional bronchoscope is still a basic useful and relevant modality in the field of pulmonary medicine till now.

Introduction

Era of bronchoscope began in 1876 when German laryngologist Gustav Killan, used oesophagoscope to remove pork bone from right main bronchus of a farmer.^[1] With the time, bronchoscopes have been evolved and flexible fibro optic bronchoscope was introduced by Ikada in 1964.^[2] Bronchoscope has become an important diagnostic as well as therapeutic tool for management of chest diseases and revolutionized the practice of pulmonologist. It provides better visibility of upper airways as well as lower airways up to sub segmental level.

The indications of bronchoscopy are numerous based on presence of respiratory symptoms and abnormal chest radiograph. Diagnostic indications are mainly lung malignancy, non resolving pneumonia, hemoptysis, collapse lung, pulmonary tuberculosis especially in presence of radiological infiltrate and negative sputum smear for AFB, granulomatous lung diseases and undiagnosed parenchyma infiltrates. Therapeutic uses of bronchoscope are removal of impacted secretion & mucous plugs, foreign body, airway balloon dilatation, stenting & debulking of malignant lesion of central airways and treatment of various other benign disorders.

In Last decade several new innovations like EBUS, cautry, argon plasma coagulation have invented. However such innovations are limited to small number of centers and do not reflect the clinical application of routine bronchoscope. Limited literature available on spectrum of routine bronchoscopy at tertiary care centre from Rajasthan prompted us take this study.

Material and Method

Our hospital is located at Jaipur in Rajasthan state which cater both urban and rural population from all over state even other adjoining states. It is also a referral center for higher medical services. This study is retrospective analysis of bronchoscopy which were carried out over period of October 2016 to November 2017 at Mahatma Gandhi Hospital. Informed consent were taken from all

subjects before subjecting for procedure. Olympus video bronchoscope 260 was used for the procedure. Detailed history and thorough clinical examination were carried out before every procedure. Contraindications, if any there were ruled out. Skiagram chest was done in all cases and computed tomograms were also obtained if required before the bronchoscopy procedure. Most of the patients were admitted in hospital and kept fasting for at least four hours before the procedure. After through gargling, 10% lignocaine solution was sprayed in oropharynx and 2% lignocaine jelly in nostril, prior to the insertion of bronchoscope. Supplemental oxygen was administered by the nasal prong to maintain the oxygen saturation above 90% in patients as needed basis during procedure. Sedation by intravenous midazolam was used as on requirement basis. Nasal route was preferred over oral route. Only when nasal route was unascertainable, oral route was used.

Observations

Over the mentioned period of time duration, bronchoscopic procedure for various indication were carried out in total 200 patients. Out of 200 patient who underwent bronchoscopy 168/200 (84%) were males while 32 (16%) were females. Majority of patients were falling above age 50 years. Youngest patient was of 16 year of age. 142(71%) patient were smoker. Cough was most common symptom in 136(68%) patients followed by chest pain 102(51%). Shortness of breath, hemoptysis, hoarseness of voice and fever were present in 96(48%), 54(27%), 32(16%) and 26(13%) respectively. Malignancy was confirmed in 88(68%) out of 130 suspected cases, while tuberculosis was confirmed in 7(54%) out 13 suspected cases presumptive pulmonary tuberculosis. Etiological agent was isolated by culture in 5 (46%) Of 11 cases of pneumonia. Bronchial biopsy was positive for malignancy in 68% while bronchial brush was positive in 51% of bronchial brush procedure. Pre bronchial biopsy

bronchial lavage was diagnostic in 30% while post biopsy was diagnostic in 45% of case.

Histopathological profile of malignancy was dominated by squamous cell carcinoma 64/88, while 11 cases were diagnosed small cell carcinoma, 8 case were adenocarcinoma type while other contributing 5 cases. Gene Xpert was positive in 7 cases out of 13 presumptive pulmonary tuberculosis while zeil neelson stain was positive in only two cases. Therapeutic bronchoscopy was performed in 46 cases. Most common therapeutic indication was collapsed lung in 41 cases and 93% were successfully expanded after procedure. Two cases of tracheal stenosis were successfully dilated by repeated balloon dilatation. Life threatening central airway obstruction by known endobronchial malignant lesion were made patent by putting self expandable metallic stent in two cases. Impacted foreign body (tooth) was also successfully removed in one patient from right intermedius bronchus.

Table 1 Sex distribution of study subject

Gender	No of patient	Percentage
Male	168	84
Female	32	16

Table 2. Age distribution of study subject

Age group	No of patients	Percentage
16-30	12	6
31-45	27	13.5
46 -60	68	34
>60	93	46.5
	200	100

Table 3. Symptom profile of study subject

Symptom	Percentage
Cough	68
Chest pain	51
Breathlessness	48
Hemoptysis	27
Hoarseness of voice	16
Fever	13

Table 4 Smoking profile of study subject

Smoking profile	No of cases	Percentage
Smoker	142	71
Non smoker	58	39
Total	200	100

Table 5 Diagnostic Yield of FOB in various pathology

Pathology	Suspected	Confirmed	percentage
Malignancy	130	88	68
Tuberculosis	13	7	54
Infective	11	5	46

Table 6 Histological profile of Malignancy in study subject

Type of malignancy	No	Percentage
Squamous	61	69
Small cell	11	12.5
Adenocarcinoma	8	9.09
Malignant epithelial neoplasm	3	3.4
Others	5	5.6

Table 7 Therapeutic profile of bronchoscopy

Indication	Procedure	No of cases	success
Collapse	Suction	41	93%
Tracheal stenosis	Balloon dilation	2	100%
Severe bilateral air way obstruction	Airway Stenting	2	100%
Foreign body	Removal	1	100%

Discussion

Majority of patient of our study were male (n 168). Smoking may be responsible for male dominated pattern. Other studies also reveals higher male predominance as reported by Huhti et al^[3], jindal et al^[4], Sharma et al^[5]. More than 80 % of patients Fall in age of beyond 46 years of age. There was linear increase in number of bronchoscopy with increase in age, this may be due that prevalence of bronchogenic carcinoma is more in elder age group. Similar observations were found in other studies^{[4]-[6]}. 71 % of patients who underwent procedure were smoker, of which majority were male. It is similar to studies done by^{[5]-[7]}. Majority of smokers were bidi smoker. Similar observation made by notani et al^[8]. Cough was commonest 68% symptom in study subject, similar observation are made by various studies^{[5]-[8]}. Majority of patient had chronic cough, it may be due to underlying chronic obstructive pulmonary disease. Change in nature of pre existing cough is warning symptom for mitotic pathology in our study. Apart from mitotic pathology tuberculosis, retained secretion and

foreign body were also contributing cause for cough.

Chest pain was present in 51% patients in our study. Patient who carried infective aetiology had sharp pleuritic nature of pain. 75% of patient who carried mitotic pathology had dull aching chest pain. 10% of carcinoma patient having severe disabling nature of pain probably due to bony metastasis.

Worsening in pre existing breathlessness was present in 48% of cases who underwent bronchoscopy procedure, 27% of patient were having hemoptysis. Majority of patient who had malignant aetiology had mild haemoptysis. Similar observation were found in other study also [4],[7], [9].

In present study 40% patient having hilar prominence, followed by collapse 30% and mass 16% suggestive of mitotic pathology. Profile of others radiological lesion were cavity, pleural effusion, rib erosion, tracheal narrowing and diaphragmatic elevation suspecting or supporting to various lung disease like tuberculosis, malignancy and infection. Garg et al also reported similar radiological finding in various lung disease of bronchoscopic indication.^[10]

Malignancy was most common diagnosis by bronchoscopy which was confirmed in 88/130 (68%) among suspected cases. Yield of bronchoscopy was higher in other studies by mozzone 80%^[11], Zavala 94%^[12], Zoss 74%^[13]. Multispeciality centre and inclusion of therapeutic bronchoscopy have diluted diagnostic yield of bronchoscopy in our study. Most common histological pattern in our study was squamous cell type 69.30% while 12.5% had small cell variety. Only 9.09% had histopathology consistent with adenocarcinoma while other contributing for 9% of total malignant diagnosis. While study by yaacob et al also showed squamous cell was most common variety followed by small cell and adenocarcinoms^[13]. Another study by lee et al observed adenocarcinoma was most frequent histological variety followed by squamous cell type^[14]. Female sex predominance in this study

may be reason for increase ratio of adenocarcinoma. Post biopsy bronchial lavage more diagnostic than pre biopsy lavage in our study while in another study it makes no difference^[15]. While tuberculosis was confirmed in 7 out 13 (54%) suspected cases. Etiological agent was isolated in 5 out of 11 cases of pneumonia. Similar observation was made by other study also^[16].

46 bronchoscopy procedure were done for therapeutic reasons. Out of them 41 were done for various pattern of collapse lung including in critically ill and intubated patients. Lung were collapse due to mucous plug and retained secretions which were successfully removed in majority by fibro optic bronchoscopy. Two case of post intubation tracheal stenosis were successfully dilated by CRE wire guided esophageal balloon dilatation catheter (Boston Scientific). Malignant airway obstruction were made patent by putting self expanding metallic stent in two cases.

Conclusion

Conventional bronchoscopy still remain useful and safe tool for various pulmonary disorders like lung mass, radiological pulmonary tuberculosis, non resolving pneumonia. Indication of bronchoscopy are same over the period of time. It is very useful in intensive care unit particularly in collapse lung caused by mucous plug. Till now, bronchoscope is underused and very useful tool in chest diseases.

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References

1. Killan G. Direct endoscopy of upper air way passage and oesophagus: its diagnostic and therapeutic value in search for removal for foreign body. J Laryngol Rhinol Otol, 1902;18:461-68.
2. Ikeda S Flexible bronchofibroscope. Ann et al rhinolaryngol,1970;79:916-27
3. Huhti E, sutinen S, Reinila A. lung cancer in a define geographical area: History and histological types Thorax, 1980;35:660-667

4. Jindal S K, Malik SK, Dhand R et al. Bronchogenic carcinoma in northern India. Thorax,1982 ;37:343-347
5. Sharma A, Gandorta N et al. Role of fibroptic bronchoscope in establishing the diagnosis of various lung diseases in a tertiary care hospital, international journal of science and research: 2319 -7064
6. Hyde L, Hyde CL. Clinical manifestation of lung cancer Chest 1974; 65:299-306
7. Gupta RC, Dixit R, Gupta N, Purohit SD. Primary bronchogenic carcinoma in the desert Indian state of Rajasthan. Chest abstract on line 16/20/99
8. Notani P, Sanghvi LD A retrospective study of lung cancer in Bombay. Br J .cancer, 1974; 29:477-482
9. Leuoux GT: bronchial carcinoma, Edinberg London E & S Livingstone 1968
10. Garg B, Sood N, Sidhu UP, Malhotra V; Role of fibroptic bronchoscopy and utility of bronchial washing and brushing in the diagnosis of lung disease , Indian journal of chest disease allied sciences 2013 ;55:145-148.
11. Mazzone P, Jain P, Arroligia AC, Matthay RA Bronchoscopy and needle biopsy techniques for the diagnosis and staging of lung cancer, clinics in chest medicine, 2002;32:137-158
12. Zwala DC Diagnostic fiberoptic bronchoscopy techniques and results of biopsy in 600 patients Chest, 1975; 68:12-19
13. Yaacob I, Harun Z, Ahmad Z Fibro optic bronchoscopy A malaysian experience , Singapore Med j,1991;32(1):26-28
14. Lee JJ Lin RL, Chen CH. Clinical manifestations of bronchogenic carcinoma J.Formos Med Assoc, 1992;91(2):146-51
15. Lee, H.S., KWON et al Bronchial washing yield before and after forceps biopsy in patients with endoscopically visible lung cancers. Respirology,2007, 12: 277-282.
16. Daniela Silva, Alcide Marques Bronchial wash/ lavage and etiologic diagnosis on immunocompromised patients. European Respiratory Journal 2013 42: P3780.