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TO STUDY THE DIAGNOSTIC ROLE OF FIBER OPTIC VIDEO BRONCHOSCOPY IN SUSPECTED CASES OF LUNG MASS

Respiratory Medicine

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ABSTRACT

Background & Objectives:
Fiber-optic video Bronchoscopy (FOB) is very safe and highly sensitive investigation for patients suspecting lung malignancy. The expected diagnostic yield of Fiber-optic Bronchoscopy (FOB) depends on location and distribution of the tumour. Central endobronchial lesions yield the highest diagnostic return. FOB provides histological diagnosis in between 60% to 80% of cases without serious complications.

Methods:
In this study, 54 patients with chest x-ray and CT (computed tomography) Scan and clinical findings consisting with Lung Mass were subjected for flexible Fiber-optic video Bronchoscopy. The data was collected using pre tested questionnaire, which elicited clinical information.

Result:
In the present study, 85.2% patients were diagnosed lung malignancy by fibre-optic video Bronchoscopy. Most common age group was 61-70 years. Youngest patient was 29 years of age and oldest patient was 81 years of age. Male were four times more than Females. 67.4% patients were smokers and most smokers had history of at least 20 pack years of smoking. Cough was most common symptom. Clubbing was most common sign. Left upper lobe was most commonly involved. Metastasis was found in most of patients. Endobronchial growth was most common bronchoscopic finding. Bronchoscopy guided bronchial biopsy was most important diagnostic tool followed by BAL cytology. Squamous cell carcinoma was most common type followed by Adenocarcinoma. Complications were occurred in only 3.8% patients with no mortality. Most of patients diagnosed at late stages.

Conclusion:
It was observed that Fiber-Optic Video Bronchoscopy is much more reliable, rapid and accurate diagnosis in suspected cases of lung mass with chest x-ray and CT (computed tomography) Scan and clinical findings consisting with Lung Mass .

KEYWORDS

Fiber optic video Bronchoscopy,Bronchial washings,Bronchial Biopsy,Trans-Bronchial Needle Aspiration,Post Bronchoscopy Sputum Cytology

INTRODUCTION

Globally, lung cancer has been the most common cancer since 1985, both in terms of incidence and mortality rate. It accounts for 12.4% of all new cancer cases (13,50,000 new cases) and 17.6% of all cancer related deaths (11,80,000 deaths) throughout the world[1]. Presently the 5- year survival rate in United States for lung cancer is 17%[2]. In India, it is one of the commonest and most lethal cancers among males accounting for 6.9% of all cancer cases and 9.3% of cancer related mortality in both sexes[3]. Compared to western population, epidemiological study shows there are raising prevalence of lung cancer in Indian population[4,5]. The main culprit is smoking.

In recent years, there has been a great interest in the histological characterization of lung cancer in view of newer histology guided therapeutic modalities and genomic classification of lung carcinoma. In western countries and most of the Asian countries, adenocarcinoma has surpassed squamous cell carcinoma[6]. This shift seems to be attributable partly to the changed smoking pattern and increasing incidence of lung cancer in females and non smokers[7,8]. Tobacco smoking constitutes the single most important carcinogen for lung cancer.

Lung cancer has been categorized into small cell carcinoma (SCLC) or non-small cell (NSCLC) lung carcinoma. The major histological types of NSCLC include adenocarcinoma, squamous cell (SCC) carcinoma, large cell carcinoma and other less common tumours subtypes.

Many invasive and non-invasive diagnostic modalities are now available to establish histopathological diagnosis of lung cancer. Yield of various modalities depend on the location of the primary lung mass.

Fiber-optic Video Bronchoscopy (FOB) is very safe and highly sensitive investigation for patients suspecting lung malignancy. Fiber-optic Bronchoscopy (FOB) was developed in the late 1960s by S. Ikeda[9] and has become the mainstay investigation in the evaluation of patients suspected of lung cancer. The expected diagnostic yield of fibre-optic Bronchoscopy (FOB) depends on location and distribution of the tumour. Central endobronchial lesions yield the highest diagnostic return[10]. FOB provides histological diagnosis in between 60% to 80% of cases without serious complications[11,12]. Beside histology, cytological diagnosis is possible with FOB. The techniques that are routinely applied include bronchial washings, brushings and biopsies. The use of transbronchial needle aspiration (TBNA) and broncho alveolar lavage (BAL) can augment the yield of FOB substantially. Biopsy of solid lesion can help in diagnosis of over 60% of cases but the success rates are lower with intramural location of tumour and fall further if the lesion is far from Bronchoscopy vision[13]. Since its introduction, published rates of complication from fibre-optic Bronchoscopy have ranged from <0.1 to 11%, with mortality generally reported between 0 and 0.1%[14].

In present study, we describe our experience with the fibre-optic video Bronchoscopy in diagnosis of suspected cases of lung mass.

MATERIALS AND METHODS

Study Type:
Cross –sectional Study

Study Setting:
Indoor facility of department of Tuberculosis and Respiratory Disease,Tertiary care centre

Study Period:
Study was conducted for period of 1 year and 3 months from August 2018 to November 2019, which included 12 months for data collection and 3 months for data entry and data analysis.

Sampling Technique: Purposive

Data Collection:
Informed written consent was obtained from the patients coming to the Department of Respiratory Medicine. Data collection was done by using a structured pre-prepared case Performa to enter the patient details, detailed clinical history including presenting complaints, radiological findings including Chest X-Ray, CT (computed tomography) Scan and Bronchoscopy findings.

Inclusion Criteria:
1) Patients consenting for the Study.

2) Adult patients aged 18 years and above.
3) Patients with radiological findings showing suspected central lung mass

Exclusion Criteria:

1) Patients not consenting for the study.
2) Person who is a known or suspected case of HIV and HbsAg infection.
3) Patients with bleeding diathesis.
4) Patients with history of recent myocardial infarction, arrhythmias and who are contraindicated for fiber-optic video Bronchoscopy.

METHOD:

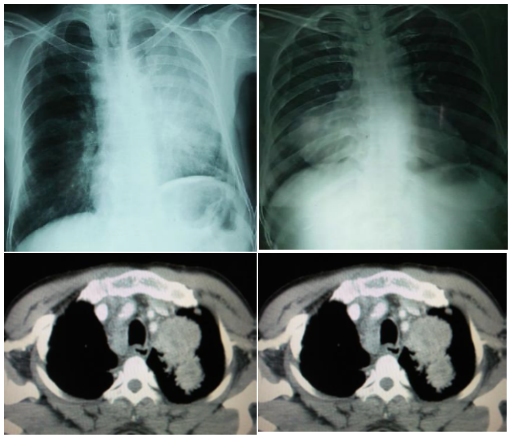
Detailed clinical history, physical examinations and investigations were carried out. Assessment of coagulation profile was done. ECG was done. All patients were subjected to sputum examination (acid fast bacilli, Gram staining, culture/sensitivity, KOH staining, malignant cells), chest radiography and haematological examination. Selected patients with chest x-ray and CT scan and clinical findings consisting with Lung Mass were subjected for

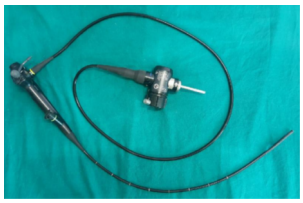
Flexible Fiber-optic Video Bronchoscopy after obtaining well informed written consent.

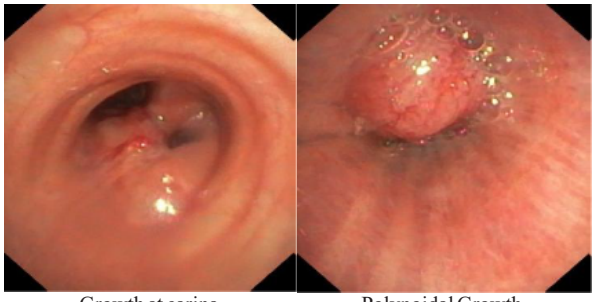
1) Patients were taken up for procedures after fasting for 4 to 6 hours.
2) Lignocaine sensitivity test done prior procedure.
3) Injection Atropine 0.6 mg intramuscularly given 30 minutes prior to the procedure to reduce airway secretions, prevent vasovagal reactions and reduce reflex bronchoconstriction.
4) Nasal anesthesia achieved with application of 2% viscous lignocaine for nasal mucosa.
5) Oropharyngeal and laryngeal anesthesia obtained with nebulized 4% topical lignocaine, & 10% lignocaine was sprayed to posterior pharyngeal wall.
6) The Bronchoscope, light source, suction channel, biopsy instruments, sample collection bottles and all the required medications were checked prior to procedure.
7) Procedure was explained to the patient in his own language reassuring the painless nature of the procedure.
8) All Bronchoscopy were done with the patient lying supine on the procedure table with the operator standing at head end.
9) All Bronchoscopy were done under conscious sedation with injection Midazolam.
10) The patency of biopsy channel was confirmed.
11) All Bronchoscopy were performed with Olympus adult type flexible fiber optic video bronchoscope (Olympus BF type 1T150).

COLLECTION AND HANDLING OF TISSUE SAMPLING MATERIAL:

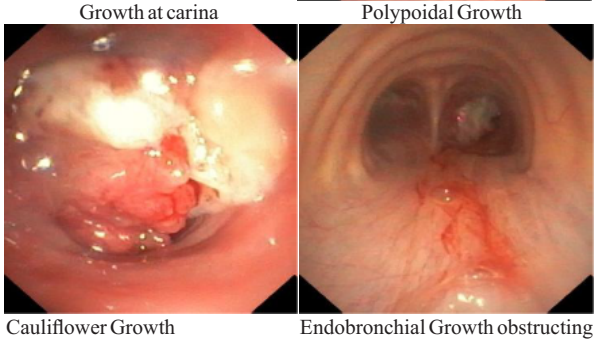
In all patients, various combinations of Bronchial washing, Endobronchial biopsy, Trans bronchial needle aspiration (TBNA), Post scopy sputum collection were carried out.







Growth at carina | Polypoidal Growth



Cauliflower Growth | Endobronchial Growth obstructing bronchus

DISCUSSION AND CONCLUSION:

Bronchoscopy was performed in all 54 patients. We diagnosed lung malignancy in 46 patients by fiber optic video Bronchoscopy. The yield was 85.2%.

1. In the present study the most common age group was 61-70 years. Most of the patients were between 51-70 years of age. A Youngest patient was 29 years and oldest patient was 81 years. Mean age was 59.7±11.9 years. Adenocarcinoma was found in all age group. Squamous cell carcinoma was mostly found in 51-60 years age group and Adenocarcinoma was mostly found in 61-70 years age group.
2. 81.5% patients were male and 18.5% patients were female. Male were four times more than Females. For diagnosed patients 80.4% were Male and 19.6% were Female.In males,Squamous cell carcinoma was more common and in female Adenocarcinoma was more common.
3. 55.6% patients attended hospital within 3 months of onset of symptoms. Earliest duration reported was 15 days and maximum delay was 12 months.
4. Most common symptom was cough present in 90.7% patients. Other common symptoms were Dyspnoea and Chest pain present in respectively 66.7% and 62.9% of patients.
5. Clubbing was present in 51.9% of patients.Weight loss was present in 46.3% and Haemoptysis was present in 37.0% of patients.
6. 67.4% were smokers and 32.6% were non-smokers.Out of smokers, 93.5% smokers had smoking history of $\geq$20 pack years of smoking.None of female was smokers. Among non-smokers females, 66.66% females had history of biomass fuel exposure. Among Smokers, Squamous cell carcinoma was more common.
7. Metastasis was found in 80.4% patients.
8. Upper lobe was most commonly involved.Left upper lobe was most commonly involved.
9. Overall most common radiological finding was mass lesion in 86.9% of patients.Hilar involvement was seen in 43.5%, mediastinal lymph node was seen in 23.9%, pleural effusion was present in 22.7%, collapse was seen in 19.8%, consolidation in 4.4%, cavitatory lesion in 2.2% of patients.B/L lung nodular lesions were seen in 2.2% of patients.
10. 22 (47.8%) patients had Squamous Cell Carcinoma, 20 (43.4%) patients had Adenocarcinoma, 2 (4.4%) patients had Small Cell Carcinoma, 1 (2.2%) patient had Large Cell Carcinoma and 1 (2.2%) patient had Undifferentiated Carcinoma.
11. Endobronchial growth and mucosal irregularity were most common findings in our study.
12. Bronchial biopsy was performed in 49 patients and got positive result in 39 (79.6%) patients. BAL was performed in 54 patients and got positive result in 27 (50.0%) patients.TBNA was positive in 2 (50.0%) out of 4 patients.Post scopy sputum cytology was

positive in 2 (3.8%) out of 53 patients.

13. Complications were occurred in only 2 (3.70%) patients out of 54 patients.

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