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Original Research Article

Clinical profile of cases of lung malignancy- A retrospective analysis by department of pulmonary medicine at tertiary care hospital, Sola, Ahmedabad

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ABSTRACT

Background and Aim: Fibre optic video bronchoscopy (FOB) is a very safe and highly sensitive investigation for patients in whom we suspect lung malignancy. Bronchoscopy revolutionized early diagnosis of lung cancer by providing cytological and histological specimen in form of bronchoalveolar lavage and bronchial biopsy. In present study we describe our experience of performing bronchoscopy in patients of suspected lung malignancy.

Methodology: Present study is retrospective observational study performed at tertiary care hospital, Sola, Ahmedabad over a period of one year. In this study 40 patients with suspected lung mass in CT underwent bronchoscopy after obtaining well informed written consent. A detailed clinical history, physical examination and necessary investigations were also done.

Results: Of the 40 cases, 30 (75%) were male and 10 (25%) were female. The mean age in this study was 63 years. Squamous cell carcinoma was most common type present in 17.5% of participant, while second most common was adenocarcinoma. Small cell carcinoma was present in 4% and carcinoid was present in 5%. Undifferentiated non-small cell carcinoma was present in 20%. The yield of the study was 60%.

Conclusions: Lung cancer is common malignancy. Bronchial biopsy has very high diagnostic yield. Bronchoscpoic techniques are safe and most precise tool for early diagnosis of suspected lung mass.

1. Introduction

Lung cancer or lung carcinoma is a malignant lung tumour characterized by uncontrolled cell growth in the lung tissues. Contributory factors include long- term tobacco smoking (>80%).[1] 10 to 15% of cases occur in people who have never smoked.[2] These cases are often caused by a combination of factors and exposure to random gas, asbestos, second- hand smoke, or other forms of air pollution.[3] The two main types of (cancer) are small–cell lung carcinoma (SCLC) and non-small-cell lung carcinoma (NSCLC).[4] Histologically non-small cell lung cancer has been classified as squamous cell carcinoma, adenocarcinoma and large cell carcinoma. Adenocarcinoma is most common type of lung carcinoma among all types consisting of 38.5% of all lung cancer cases, with squamous cell carcinoma accounting for 20% and large cell carcinoma accounting for 2.9%.[5] It also appears that lung cancer is more common in nonsmoking women than in nonsmoking men. Diagnosis was made mainly by chest radiographs and computed tomography (CT) scans. The diagnosis was confirmed with biopsy by bronchoscopy or CT-guidance.[6]

Fibre optic video bronchoscopy (FOB) is a very safe and highly sensitive investigation for patients in whom we suspect lung malignancy. The lung carcinoma can be diagnosed by FNAC (Fine Needle Aspiration Cytology), biopsy. Various types of biopsies are: Endobronchial biopsy (EBLB), trans bronchial lung biopsy (TBLB) and trans bronchial needle aspiration (TBNA). Fibre optic bronchoscopy (FOB) was developed in the late 1960s by Ikeda[7] and has become the mainstay investigation in the evaluation of patients suspected of lung cancer. The

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expected diagnostic yield of Fibre optic bronchoscopy (FOB) depends on location and distribution of the tumor. Central endobronchial lesions yield the highest diagnostic return.[8] FOB provides histological diagnosis in between 60% to 80% of cases without serious complications.[9,10] Beside histology, cytological diagnosis is possible with FOB.

Worldwide in both genders combined, lung cancer is on the whole a frequently diagnosed cancer and the important cause of cancer death. Being a tertiary care hospital, we have the facility of Flexible Fibre optic Bronchoscopy (FOB) by which we are able to diagnose the lung carcinoma by endobronchial biopsy (EBLB) and Broncho-alveolar lavage (BAL).

2. Material and Methods

This retrospective observational study was conducted in the Department of Pulmonary Medicine at GMERS Medical College and Civil Hospital, Sola, Ahmedabad after taking an ethics committee approval. A retrospective analysis of medical records of the patients, who underwent for Fibre-Optic Bronchoscopy (FOB) from December 2018 to December 2019 was done. We collected data of patients who underwent bronchoscopy. We collected data of clinical presentation, smoking status, chest X-ray findings, CT thorax reports, bronchoscopy findings, histopathology and cytology report.

Patients with suspected lung mass on Chest X-ray or CT thorax were underwent Fibre-Optic Bronchoscopy (FOB) after written informed consent. Before FOB Detailed clinical history, physical examinations and investigations like complete blood counts, RFT (Renal function test), LFT (liver function test), Coagulation profile and ECG were carried out. Pre bronchoscopy preparations and bronchoscopy procedure were carried out as per guideline. Fibre-optic bronchoscopy was performed under local anaesthesia along with sedation with intravenous midazolam wherever required. Thorough examination of nasopharynx and larynx, vocal cords and trachea, carina and tracheobronchial tree were done. Bronchoscope was maneuvered into the normal bronchial tree first then on the abnormal side. If bilateral lesions were present, then bronchoscope was maneuvered first on right side. Samples were obtained after careful complete visualization of both sides. Biopsies were taken from intraluminal growths, Nodular lesion and irregular mucosa of bronchial wall for histopathological examinations.When the tumour was visible bronchoscopically, Bronchial wash were obtained by aspiration of any secretion and instillation, followed by immediate aspiration of two aliquots of 20 ml of sterile isotonic 0.9% saline solution at room temperature. Following this, EBB was performed with alligator forceps with serrated jaws. The biopsy material obtained by forceps was put into a container containing 10% formalin and it was sent for Histopathological examination. Bronchioalveolar lavage (BAL) was taken after biopsy procedure for cytological evaluations. Oxygen saturation was monitored during procedure with a pulse oximetry. Post bronchoscopy sputum were collected in sterile container within two hours of bronchoscopy and was also sent for cytological examination.

3. Results

We had total 40 patients who underwent bronchoscopy. Their mean age was 63 (35-82) years. Out of 40, 30 were male and 10 were female. Out of 30 male patients 27 (57.5%) were smokers. Among smokers 7 (30.4%) patients had $\leq$20 pack years. 10 (43.47%) patients had 21-40 pack years and 6 (26.08%) patients had $\geq$41 pack years.

Cough(62.5%),chest pain (57.5%), dyspnoea on exertion (27.5%)were the most common symptom followed by weight loss(17.5%), fever (15%) and haemoptysis(15%), hoarseness of voice (15%), back pain (12.5%) and decreased appetite (5%). Superior vena cava (SVC) obstruction was present in 2 (5%) patients at the time of hospitalisation. (Table 1)

Table 1: Symptoms of study participants

Symptoms	No. of cases (n=40)
Cough	62.5% (31)
Chest pain	57.5% (23)
Dyspnoea on exertion	27.5% (11)
Weight loss	17.5% (7)
Haemoptysis	15% (6)
Hoarseness of voice	15% (6)
Fever	15% (6)
Back pain	12.5% (5)
Decease appetite	5% (2)

In present study in chest X-rays finding upper zone involvement seen in 19 patients, mid-zone involvement seen in 10 patients and lower zone involvement seen in 5 and hilar involvement seen in 6 patients. Upper zone involvement more on left side while mid zone and lower zone involvement seen more on right side. While hilar involvement seen in similar number of patients on both side.

Table 2: Involved area in CT thorax of study participants

Involved area in CT t horax	Right side	Left side
Upper lobe	8	11
Middle lobe	4	
Lower lobe	7	3
Hilar	5	4
Pleural effusion	4	1

On CECT chest findings, on right side, upper lobe involved in 8 (20%) patients, middle lobe in 4(10%) patients, lower lobe involved in 7(17.5%) patients, hilar

involvement in 5(12.5%) patients and pleural effusion was present in 4(10%) patients. On left side upper lobe was involved in 11(27.5%) patients, lower lobe was involved in 3(7.5%) patients, hilar involvement was seen in 4(10%) patients and pleural effusion was seen in one patient. 9(22.5%) patient had hilar involvement. 11(27.5%) patients had mediastinal lymphadenopathy and(5%) patients had bilateral nodular lesion. (Table 2)

Other CECT finding like collapse (5%), consolidations (2.5%) and cavitory findings were also present.

In this study, on bronchoscopy finding mucosal irregularity seen in 19 (47.5%) patients, luminal narrowing in 9(22.5%) patients, complete obstruction in 6(15%) patients, partial obstruction in 2(5%), endobronchial growth in 2(5%) patients, external compression in 3 (7.5%) patients and polypoidal mass in 2(5%) patients seen. Bronchial biopsy was taken in all 40 patients, out of these 23(57.5%) patients were positive for malignancy. BAL was taken in all 40 patients, out of these 8(20%) patients had BAL positive for malignancy Post bronchoscopy sputum cytology was positive in 2(5%) patients, both were diagnosed for adenocarcinoma. In one patient left supra-clavicular FNAC was positive for malignancy. In one patient BAL was positive for malignancy, but bronchial biopsy was negative.

Table 3: Bronchoscopy procedures

Bronchoscopy procedures		
Procedure	**Performed**	**Positive**
BAL	40	8
Bronchial biopsy	40	23
FNAC	2	1
Post bronchoscopy sputum cytology	40	2

In study squamous cell carcinoma was present in 7(17.5%) patients, non-small cell carcinoma in 8(20%), adenocarcinoma in 6(15%) patients, carcinoid in 2(5%) patients and small cell carcinoma in 1(2.5%) and metastatic carcinoma by FNAC of lymph node in 1(2.5%) patients. 15(37.5%) patients were undiagnosed. Thus the yield was 60%.

Table 4: Histological cell types

Histological cell types		
Squamous cell carcinoma	7	17.5%
Adenocarcinoma	6	15%
Small cell carcinoma	1	2.5%
Non-small cell carcinoma	8	20%
Carcinoid	2	5%
Metastasis	1	2.5%

In this study all smokers were male. Squamous cell carcinoma was most common in smokers and most smokers had smoking history of at least 20 pack years. All 7 patients of squamous cell carcinoma were male. Adenocarcinoma was found in 3 male smokers, while in 3 non-smoker females. Thus, adenocarcinoma was most commonly found in non-smoker female. Non-small cell carcinoma seen in 4 smoker and 4 non-smoker patients.

Most common site of origin of lung malignancy was left upper lobe. Squamous cell carcinoma was most common in left upper lobe. 5 patients had hilum as a site of origin for lung malignancy. Hilar involvement was present in 3(42.8%) patients of squamous cell carcinoma and 2 patients of non-small cell carcinoma. Pleural effusion was observed in 2(33.3%) of adenocarcinoma patients, 1(14.3%) patient of squamous cell carcinoma and 1(14.3%) patient of carcinoid. Mediastinal lymphadenopathy was present in 3 of squamous cell carcinoma, 2 adenocarcinoma and 1 carcinoid patient. Metastasis was present in 15 patients among total 40 patients. Among 8 patients of non-small cell carcinoma 1(12.5%) patient had metastasis. In 7 squamous cell carcinoma patients one had adrenal metastasis and one had adrenal, liver, pleural metastasis and peritoneal metastasis. In 8patients of non-small cell carcinoma 2(25%) had skeletal metastasis, 1(12.5%) had pleural metastasis, 1(12.5%) peritoneal metastasis and 1(12.5%) adrenal metastasis.

In 7 patients of squamous cell carcinoma in bronchoscopy finding complete obstruction by growth seen in 5 patients while irregular mucosa seen in 2 patients. While out of 6 patients having adenocarcinoma on bronchoscopy findings irregular mucosa seen in 3 patients, bronchial narrowing by external compression and irregular mucosa seen in 2 patients while 1 patient have partial bronchial obstruction with mass.

4. Discussion

There are many diagnostic methods used for lung malignancy, Fibre-optic bronchoscopy is one of the safe methods. In Current study we did retrospective analysis of role of fibre optic bronchoscopy and endobronchial biopsy in diagnosis of lung malignancy. In present study mean age of patient was 63 years, while study conducted by Kumar et al.,[11] is 54.71 years. And in study conducted by Arun et al.,[12] is 60.91 years.

In present study 30 patients were male, while 10 patients were female while in study done by Kumar et al.,[11] there were 37 male and 8 female while study by Arun et al.,[12] There were 46 male and 8 female. In the present study, 68.5% of the patients were smokers. No one of female participants was smoker. A similar finding seen in study done by Bhavsar et al.,[13](69%) and Kumar et al.,[11] (66%). Cough (77.5%), chest pain (57.5%), dyspnoea on exertion (27.5%) were the most common symptom. Similar observation seen in other studies. (Done by Arun et al.,[12] and Bhavsar et al.,[13]). Yield of endobronchial biopsy is more as compared to BAL for histological diagnosis of lung malignancy. In our study we diagnostic yield of

bronchoscopy is 60%. While study done by Arunet et al.,[12] is 59.26%. While in study done by Sharma et al.,[14] it was 30%.

In present study most common histological type is squamous cell carcinoma, followed by adenocarcinoma. While many studies showed squamous cell carcinoma is the most common type in lung malignancy (By Kshatriya et al.,[15] Rabahi et al.,[16]), while other study shows adenocarcinoma is most common. (Bhavasar et al[13]). Among Smokers, Squamous cell carcinoma was more frequent histological subtype found. Similar Findings seen in many other studies. (By Bhavsar et al.,[13] Kumar et al.,[11] Kshatriya et al.,[15]). Aadenocarcinoma was more seen in female and non-smoker male.[5] In present study out of 6 females with lung malignancy diagnosed by bronchoscopy 1 female had diagnosis of adenocarcinoma.

In present study upper lobe involvement is more and left lung involvement is more. In present study upper lobe was most commonly involved, similar findings seen in study done by Rabahi et al.,[16]

All patients were referred to cancer institute for further management.

5. Conclusions

Out of many diagnostic methods for lung malignancy, fibre optic bronchoscopy is easiest and safe method for early diagnosis. Though facility and trained staff not available for TBLB, endobronchial biopsy and BAL are useful in early diagnosis of lung carcinoma.

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8. Conflict of Interest

The authors declare that they have no conflict of interest.

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