Original Research Article

Pattern of transbroncial lung biopsy-proven lung malignancies in tertiary care hospital in north India: a clinicopathological study

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ABSTRACT

Background: The purpose of our study was to assess the pattern of transbronchial lung biopsy (TBLB) proven lung malignancies in our region. TBLB is an effective and low cost technique that can be easily employed to make the diagnosis of lung malignancies.
Methods: In our centre, we analysed 120 cases of biopsy proven lung malignancy that underwent TBLB from January 2014 to May 2016. In all of these 120 cases, the commonest indication of TBLB was radiological opacity found on chest X-ray and/or CT scan.
Results: 106 cases (88.3%) were males and 14 cases (11.7%) were females. Most of patients were more than 50 years of age. The histopathological analysis revealed squamous cell carcinoma as the most common lung malignancy (n = 88, 77.3%) followed by small cell carcinoma (n = 20, 16.7%), adenocarcinoma (n = 11, 9.2%) and 01 case of carcinoid tumour (0.8%). Commonest lung malignancy among females was adenocarcinoma (n = 8, 57.1%) and among males squamous cell carcinoma (n = 85, 80%).
Conclusions: TBLB thus is an important tool in making the diagnosis and histopathological classification of lung malignancies.

Keywords: Bronchoscopy, Biopsy, Histopathology, Lung cancer

INTRODUCTION

Lung carcinoma is a complex neoplasm. Lung cancer is responsible for more deaths each year than colon cancer, breast cancer and prostate cancer combined, 12.6% of all new cancers and 17.8% of cancer deaths in India. Approximately, 63000 new lung cancer cases are reported each year in India.[1]

Lung cancer accounts for 22% and 14.6% of cancer deaths in developed and developing countries respectively. This dismal mortality makes early diagnosis and treatment essential for improvement in morbidity and mortality.[2,3] The flexible bronchoscope has become the main diagnostic tool in the evaluation of patients of lung cancer, with more than 70% of lung carcinoma being approachable via bronchoscopy. Transbronchial lung biopsy via fibreoptic

bronchoscope is an extremely useful technique by which bronchial as well as lung biopsies can be taken.[4] With the use of the fibreoptic bronchoscope, advanced radiological guidance and increasing expertise the diagnostic yield of bronchoscopy has increased considerably.

Cytology is being increasingly used for the evaluation of pulmonary malignancies. Various sampling techniques are available to procure sample for cytological evaluation in lung malignancies including exfoliative cytology samples such as induced sputum, abrasive cytology samples (bronchial brushing, bronchial washing, bronchoalveolar lavage) and fine needle aspiration cytology, which can be endobronchial-ultrasound guided, transesophageal, CT guided, percutaneous or transthoracic.[5,6] However, due to high morbidity associated with and non- availability of open

lung biopsy in many centres, high resolution computer tomography followed by transbronchial lung biopsy (TBLB) continue to remain the mainstay of diagnosis of lung malignancies.

The present study was undertaken to evaluate histopathological patterns of lung malignancies on TBLB in patients presenting to a tertiary care centre in north India.

METHODS

Out of all the patients who underwent TBLB in our centre from January 2014 to May 2016, 120 patients were proven lung malignancies. Patients who underwent TBLB were selected on the basis clinical and radiological suspicion.

All specimens obtained were processed routinely and stained with haematoxylin-eosin stain. The special stains like reticulin and mucicarmine were used wherever necessary. Routine stains like periodic acid Schiff stain, Gram's stain, Ziehl-neelsen stain were used to rule out infections. Biopsy specimen was considered adequate when it contained more than 20 alveoli. The pathological features evaluated in each sample were alteration in the alveolar architecture, atypical cells, abnormal mitosis and inflammatory as well as granulomatous infiltrates.

RESULTS

A total of 120 transbronchial lung biopsies were analysed from January 2014 to May 2016. The commonest indication for lung biopsy in most of the cases was a suspected lesion either on chest X-ray or CT scan. In the present study, adequate tissue for reporting was obtained in 120 patients. The histopathological analysis of these specimens showed squamous cell carcinoma (SCC) as the most common lung tumour (Figure 1). Out of 120 cases, 88 cases (73.3%) were squamous cell carcinomas, 20 cases (16.7%) were small cell carcinomas (SmCC), adenocarcinoma was found in 11 cases (9.2%) and 01 case

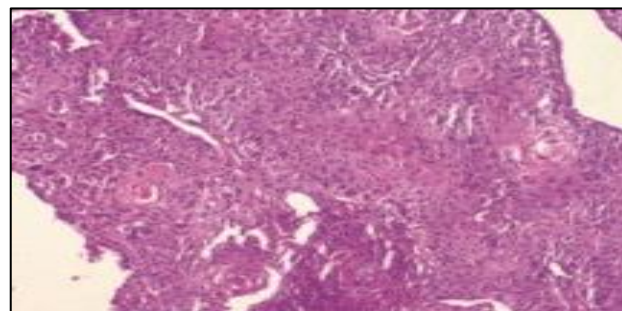(0.8%) came out to be carcinoid tumour (Table 1). These findings are consistent with previous study by Ritu et al.[7]

Figure 1: A well differentiated squamous cells carcinoma lung-numerous squamous pearls seen (H and E 40×10X).

Table 1: Distribution of the pattern of lesions in lung biopsies (n = 120).

Histopathological pattern	Number of cases	Per-centage (%)
Squamous cell carcinoma (SCC)	88	73.3
Small cell carcinoma (SmCC)	20	16.7
Adenocarcinoma	11	9.2
Carcinoid	01	0.8

Amongst the cases of squamous cell carcinomas, well-differentiated SCC were 15 cases (17%), moderately differentiated SCC were the most common, 60 cases (68.2%) and poorly differentiated SCC were 13 cases (14.8%). Out of 88 cases of SCC, 85 cases (96.6%) were males and 03 cases (3.4 %) were females. Among males, 15 cases (17.6%) were well differentiated, 58 cases (68.3%) were moderately differentiated and 12 cases (14.1%) were poorly differentiated. Among females, 02 cases (66.7%) were moderately differentiated and 01 case (33.3%) was poorly differentiated (Table 2).

Table 2: Pattern of lung malignancies among male and female cases.

Sex	Squamous cell carcinoma (SCC)			Small Cell carcinoma (SmCC)	Adeno-carcinoma	Carcinoid
	Well differentiated (SCC)	Moderately differentiated (SCC)	Poorly differentiated (SCC)			
Male	15	58	12	18	3	0
Female	0	2	1	2	8	1
Total	**15**	**60**	**13**	**20**	**11**	**1**

Out of 20 cases of small cell carcinoma (Figure 2), 18 cases (90%) were males and 02 cases (10%) were

females. Amongst the 11 cases of adenocarcinomas (Figure 3), interestingly 08 cases (72.7%) were females and 03

cases (27.3%) were males. A single case of carcinoid tumour was found in a female (Figure 4).

Age distribution analysis of the cases showed most of them 66 cases (55%) in 61-80 years age group, 49 cases (40.9%) in 41-60 years age group, 04 cases (3.3%) and 01 case (0.8%) were in 21-40 years and <=20 years age group respectively.
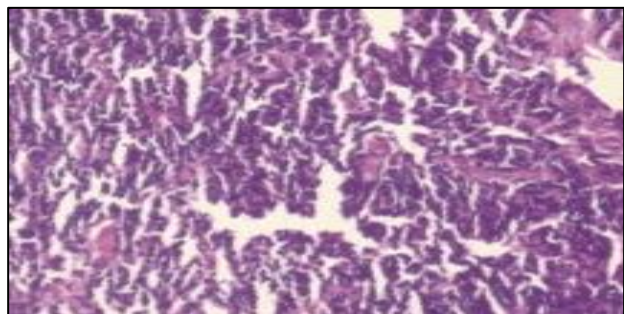

Figure 2: Small cell carcinoma lung- tumor is composed of small round and spindle cells (H and E 40 × 10X).

Out of 66 cases in the age group of 61-80, 62 cases (94%) were males, 04 cases (06%) were females and in 41-60 years age group, out of 49 cases 41 cases (84%) were males and 08 cases (16%) were females. In 21-40 years age group there were only 04 cases, 02 (50%) were males and 02 (50%) were females. Only one male case was found in age group of <20 years (Table 3).
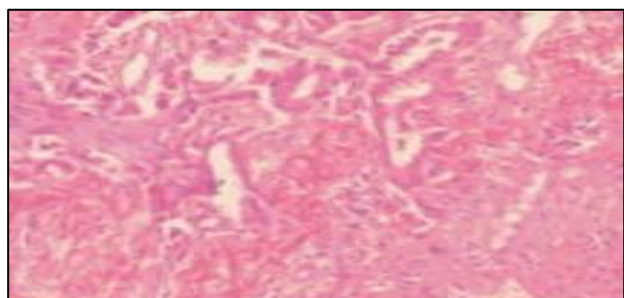

Figure 3: An adenocarcinoma lung many neoplastic glands embedded in fibrous stroma seen (H and E 40 × 10X).
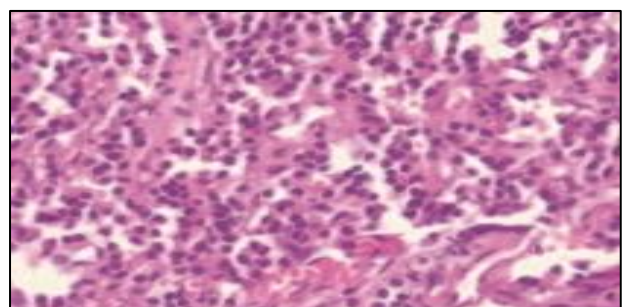

Figure 4: A carcinoid tumor lung- tumor cells are seen in an organoid pattern.

Table 3: Age and sex distribution of lung malignancies among cases.

Age	Males	Females	Total
≤20	01	0	01
21-40	02	02	04
41-60	41	08	49
61-80	62	04	66

DISCUSSION

Lung cancer has become the leading cause of cancer related death worldwide due to the environmental pollution, occupational exposure, genetic susceptibility, increasing number of smokers and others.[8] In the present study, a suspicious chest X-ray and /or CT chest finding was the commonest indication of lung biopsy. In similar studies performed by Garg B et al and Jindal et al, the pre-bronchoscopic diagnosis was bronchogenic carcinoma in majority of their cases.[9,10]

In present study, the most common clinical presentation of the patients was cough, 93 cases (77.5%), 38 cases (31.6%) presented with chest pain, shortness of breath and haemoptysis were seen in 30 cases (25%) and 18 cases (15%) respectively. Most of the patients presented with more than one symptoms. These findings are consistent with the previous study done by Jianguo Li et al.[11]

Flexible bronchoscopy (FB) is the most widely used technique for diagnosis of peripheral lung cancer. Usually, a combination of sampling procedures such as bronchial washing, brushing, transbronchial biopsy and peripheral transbronchial needle aspiration (TBNA) are performed in these patients. According to an evidence based review, FB provided diagnostic specimen in 36-88%, with an average of 78% in 16 studies of patients with peripheral lung cancers.[12] TBLB is the most useful sampling method for the diagnosis of peripheral lung cancer. The average diagnostic yield from TBLB is 57% with a range of 17-77% in patients with peripheral lung cancers.[13]

The diagnostic yield of bronchoscopy for malignancy depends upon the location and the size of the lesion. Central endobronchial lesions carry the highest diagnostic yield of more than 90%, whereas small peripheral lesions have lower yield. In visible, but intramural rather than endobronchial tumours, the diagnostic yield decreases to around 55%.[14,15]

In this study, out of 120 cases, malignancy of the right lung was seen in 67 cases (56%) and malignancy of the left lung was seen in 53 cases (44%). Jianguo Li et al,reported the similar results.[11] In our observations, squamous cell carcinoma was the commonest tumour consistent with the study by Faber et al and Garg et al.[9,16] Most of the male patients showed moderately differentiated squamous cell carcinoma on histopathological analysis and the maximum number of male patients were above 60 years of age. On

the other hand, among females, adenocarcinoma was the commonest malignancy found and the maximum number of females was in 41-60 years age group. All male and female patients who showed adenocarcinoma on histopathological analysis were non-smokers.

CONCLUSION

In conclusion, TBLB for the diagnosis of lung malignancies has come a long way from the time these specimens were first obtained via a rigid bronchoscope. The result of our study indicates that TBLB is an effective and low cost way to diagnose lung cancers. As far as the histopathological analysis goes, squamous cell carcinoma was the commonest lung malignancy overall, with moderately differentiated SCC as most frequent subtype followed by well differentiated SCC and poorly differentiated SCC respectively. Interestingly, we found that adenocarcinoma was the commonest lung malignancy among the females.

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