ORIGINAL RESEARCH

Transbronchial and endobronchial lung biopsies: Study of spectrum of histomorphological features

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ABSTRACT
Aim: The aim of the present study was to evaluate the histopathological patterns identified on Transbronchial lung biopsy (TBLB) &Endobronchial Biopsy (EBB).
Methods: The retrospective study was conducted for the period of 3 years and 125 consecutive bronchoscopic biopsies were included in the study. All bronchial biopsies were received in neutral buffered formalin, were processed as per standard procedure. 4-5 μm thick sections were cut on microtome and stained with Hematoxylin and Eosin (H&E) stain and the slides were studied in details microscopically. Special stains like Periodic Acid Schiff (PAS) and Ziehl–Neelsen (ZN) were used when needed.
Results: Among 110 cases included in the study, 32 (29.10%) were female and 78 (70.90%) were male. The age range in the present study was 20 -78 years. The maximum number of patients was in the age group of 51-60 years and 61-70 years (40 each; 36.36%). Out of 102, 36 patients had chronic interstitial inflammation±Fibrosis followed by neoplasia in 20 patients. Out of 102 patients, 70 (68.6%) patients had contributory diagnostic yield.
Conclusion: With availability of adequate material TBLBs & EBBs can provide useful diagnostic information (60.8% of cases in this study). Systematic categorisation of the histopathological patterns identified on TBLB helps to increase the diagnostic yield. Correlation with clinical and radiological features required for confirming the diagnosis accurately.
Keywords: Endobronchial Biopsy, Transbronchial lung biopsy, histopathological patterns

INTRODUCTION

The flexible bronchoscope was introduced in the United States in the late 1960s and allowed pulmonologists and surgeons access to the lung as never before.[1,2] The small biopsy samples obtained with this instrument present special challenges to the general surgical pathologist, not the least of which is knowledge of the clinical and radiologic context that prompted the biopsy. In the case of diffuse or multifocal parenchymal disease, the transbronchial biopsy (TBB) approach is used, often with fluoroscopic guidance.

Conventional transbronchial lung biopsy (TBLB) is a relatively safe technique routinely employed by pulmonologists for the diagnosis of diffuse parenchymal lung disease (DPLD). Biopsies of the lung have been obtained via bronchoscopy for nearly 60 years.[3]In routine practice, both clinical evaluation

and pattern recognition from a high-resolution computed tomography (HRCT) scan of the thorax is not always helpful in the diagnosis of DPLD. When clinical-radiological information discordance occurs in DPLD, biopsies may be necessary. Cryobiopsy is associated with a higher diagnostic yield and a favorable risk/benefit ratio.[4] Nevertheless, TBLB remains the representative method for definite diagnosis in developing countries.

Previous studies[5-7] have mostly focused on the diagnostic accuracy of TBLB in terms of histology, as well as on the complications of TBLB procedures in various patient populations. Majority of patients having lung cancer had direct exposure to smoking. Squamous cell carcinomas and small cell carcinomas showed significant association with smoking.[8]The clinical features of carcinoma lung result from the local growth and regional growth of the tumor as well

as lymphatic invasion, haematogenous distant metastatic spread and remote para-neoplastic effects from tumour products or immune cross- reaction with tumour antigens.[9] More interest has been developed in the histological characterisation of lung cancer in recent years in view of newer histology guided therapeutic modalities and genomic classification of lung carcinoma.[10,11] At present more than 50% of lung adenocarcinomas and about a third of squamous cell carcinomas can be characterised based on the mutation profile. Epidermal growth factor receptors (EGFR) mutation explain the therapeutic importance of molecular classification.[12]

The aim of the present study was to evaluate the histopathological patterns identified on Transbronchial lung biopsy (TBLB) &Endobronchial Biopsy (EBB).

MATERIALS AND METHODS

The retrospective study was conducted for the period of 3 years and 125 consecutive bronchoscopic biopsies in 110 patients were included in the study.

All bronchial biopsies were received in neutral buffered formalin, were processed as per standard procedure. 4-5 μm thick sections were cut on microtome and stained with Hematoxylin and Eosin (H&E) stain and the slides were studied in details microscopically. Special stains like Periodic Acid Schiff (PAS) and Ziehl–Neelsen (ZN) were used when needed.
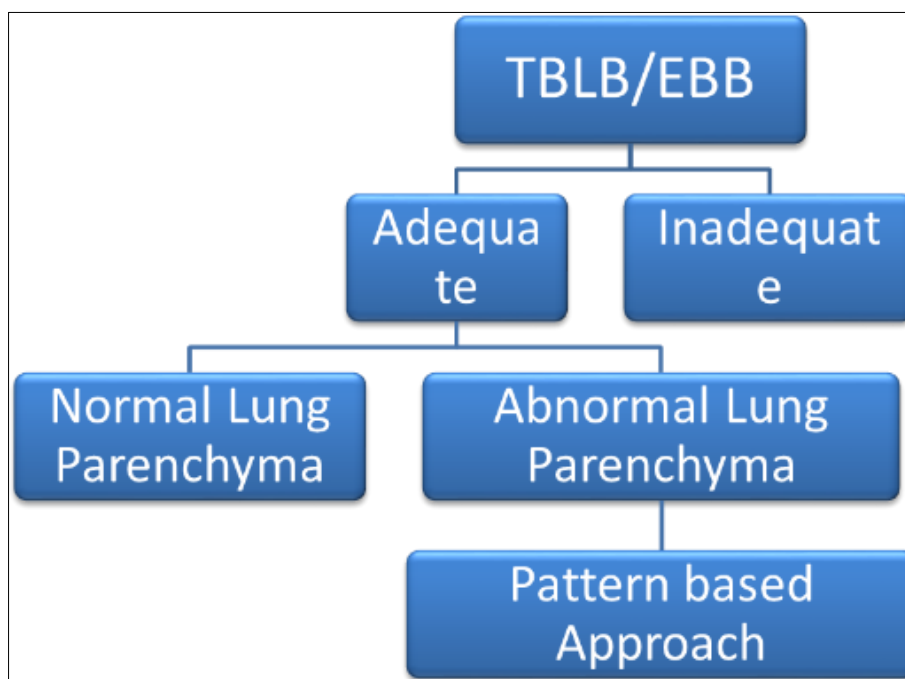

Fig 1: Approach to diagnosis

Table 1: Pattern based Diagnostic Approach by Leslie *et al*

Pattern 1	No specific diagnostic abnormality
Pattern 2	Acute pneumonitis
Pattern 3	Neoplasia
Pattern 4	Chronic interstitial inflammation ± fibrosis
Pattern 5	Granulomatous inflammation
Pattern 6	Other specific causes

Data were analyzed using standard statistical method including SPSS 20.0.

RESULTS
Table 1: Gender distribution

Sex	Frequency	%
Female	32	29.10
Male	78	70.90
Total	110	100

Among 110 cases included in the study, 32 (29.10%) were female and 78 (70.90%) were male.

Table 2: Age distribution

Age group (Year)	Frequency	%
20-30	11	10
40-50	11	10
51-60	40	36.36
61-70	40	36.36
>70	8	7.28
Total	110	100

The age range in the present study was 20 -78 years. The maximum number of patients was in the age group of 51-60 years and 61-70 years (40 each; 36.36%).

Table 3: Pattern Based Classification of Histopathological Diagnosis on TBLB/EBB

Patterns	Histopathological Diagnosis	EBB	TBLB	N (%)
1	Normal bronchial/Lung parenchyma	15	17	32 (31.37)
2	Acute pneumonitis	-	1	1 (0.98)
3	Neoplasia	12	8	20 (19.60)
4	Chronic interstitial inflammation±Fibrosis	-	36	36 (35.29)
5	Granulomatous inflammation	5	4	9 (8.82)
6	Other specific cases	-	4	4 (3.92)
Total		32	70	102

Out of 102, 36 patients had Chronic interstitial inflammation±Fibrosis followed by neoplasia in 20 patients.

Table 4: Overall diagnostic yield

	Contributory			Non-contributory	Total (%)
	Diagnostic	Helpful	Total		
TBLB	17	36	53	17	70
EBB	17	-	17	15	32
Total	34	36	70	32	102

Out of 102 patients, 70 (68.6%) patients had contributory diagnostic yield.

DISCUSSION

Endobronchial biopsy isobtainedviabronchoscopy passed through the nose or mouthtovisualizethe upper airway, identify any changes or lesion and collect pieces of lung tissue which allows assessment of various diseases including infectious, benign and malignant. Lung cancer is currently the most frequently diagnosed cancer in the world and the most common cause of cancer mortality worldwide, comprising 17% of total new cases in male and 23% in female.[13] Lung cancer is one of the leading case of cancer related deaths in men and women. The increasing number of deaths is mainly due to its detection at the late stage.[14] Thus, timely detection and management is important for long term survival of the patients. Bronchial biopsy and histopathology is a valuable tool in diagnosis of lung disease, both benign and malignant.

Among 110 cases included in the study, 32 (29.10%) were female and 78 (70.90%) were male which was similar to study done by Bhat et al[13], Fuladiet al[15] and Bodh et al.[16] The age range in the present study was 20 -78 years. The maximum number of patients was in the age group of 51-60 years and 61-70 years (40 each; 36.36%). Out of 102, 36 patients had Chronic interstitial inflammation±Fibrosis followed by neoplasia in 20 patients. Out of 102 patients, 70 (68.6%) patients had contributory diagnostic yield. Gupta et al[17] also found that most common location of small cell carcinoma was central (50%). Adenocarcinoma most commonly manifests as peripheral mass or a malignant pleural effusion.The study conducted by Rawatet al[18] which observed that adenocarcinoma commonly manifested as peripheral mass or a malignant pleural effusion. This could be explained because of still lower incidence of female smokers in India.

There is changing trend of pathological pattern of lung cancer in the West. Women were increasingly diagnosed with Lung cancer having adenocarcinoma as the commonest histological type Kumar et al.[19] Recently, astudy noted that TBLB combined with clinical and HRCTdata can lead to a confident and accurate diagnosis in20%–30% of patients with fibrotic ILD.[20] Despite the lackof prospective studies investigating the definite role ofTBLB in IPF, and despite its poor sensitivity, TBLB mightbe a reasonable option for patients with suspected fibroticILD, who cannot be diagnosed based on

clinical-radiologicalinformation alone, or who cannot toleratetransbronchial lung cryobiopsy (TBLC) or surgical lungbiopsy (SLB).

CONCLUSION

With availability of adequate material TBLBs & EBBs can provide useful diagnostic information (60.8% of cases in this study). Systematic categorisation of the histopathological patterns identified on TBLB helps to increase the diagnostic yield. Correlation with clinical and radiological features required for confirming the diagnosis accurately.

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