ORIGINAL ARTICLE

DIAGNOSTIC YIELD OF BIOPSIES VIA FIBRE-OPTIC BRONCHOSCOPY

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Background: Priority of all bronchoscopies has been diagnostic yield and various techniques have been introduced to improve it. Transbronchial biopsy (TBB) and transbronchial aspirates (TBA) also play an important role in improving diagnostic yield. The aim of the study was to determine the diagnostic yield of biopsies via fibre optic bronchoscopy (FOB) in 108 cases in which it was indicated. **Methods:** This was a cross-sectional study conducted in the Pulmonology department of Ayub teaching Hospital Abbottabad. Patients of all ages, sex and occupation on whom bronchoscopies were performed were included in the study. Bronchial biopsies were taken. **Results:** Out of 108 patients, who were biopsied, malignancy was confirmed in 48%, benign lesions in 49% and only 3% were non-diagnostic biopsies. **Conclusion:** Diagnostic yield of FOB is good and is very useful for the diagnosis of pulmonary lesions.

Keywords: Fiberoptic, Bronchoscopy, Diagnostic yield, Endobronchial biopsy, Transbronchial biopsy, segmental bronchi.

J Ayub Med Coll Abbottabad 2014;26(4):488–90

INTRODUCTION

Bronchoscopy is a technique by virtue of which we visualize the airways not only for diagnostic but therapeutic purposes as well. Bronchoscope is entered into the airways through nose or mouth, and occasionally through a tracheostomy which enables us to examine the patient's airways for various pathologies such as tumours, foreign bodies, bleeding or inflammation. Specimens can be taken not only from inside the bronchus but also from the lungs. Bronchoscopes are of two types: rigid metal tubes with attached lighting devices and an optical fibre instrument which is flexible. Real time video equipment is attached to it. TBA and Transbronchial biopsy (TBB) has shown improvement in diagnostic yield of all bronchoscopies.[1] In macroscopically visible tumours yield of endobronchial biopsy is 92% and in lesions which are peripheral and not visible endoscopically, TBA and TBB have shown diagnostic yield of 50%.[2]

Flexible bronchoscopy is being used both as an out-patient and in-patient procedure for diagnostic and therapeutic purposes. Gustav Killian performed the first bronchoscopy for extraction of a piece of pork bone from the right main bronchus in 1897.[3] Shigeto Ikedas introduced flexible bronchoscope in 1966.[4] Since then it has been an important tool in diagnosing pulmonary diseases. Patient preparation for elective bronchoscopy includes fasting prior to procedure, informed consent, topical anaesthesia and careful sedation in some cases.[5]

The reported diagnostic yield from endobronchial biopsy is 80% with a range of 51–97%.[6] Three biopsy specimens of an endobronchial lesion suspected to be bronchogenic carcinoma can provide a diagnostic yield of over 97%.[7] Biopsies of the surface of endobronchial tumour may be falsely negative if there is peripheral necrosis. In such cases deep needle sampling is preferable.

Transbronchial biopsy (TBB) is the technique by which a piece of lung parenchyma is obtained by using flexible forceps positioned distally via FOB. In many instances TBB can replace open lung biopsy. TBB has a diagnostic yield of 40–90% in sarcoidosis[8], 10–40% in Langerhans cell histiocytosis[9], 88–97% in *Pneumocystosis jerovecii* pneumonia[10], and 57–79% in lung infections caused by *Mycobacterium tuberculosis.*[11] The more the biopsy specimens taken the higher is the yield.[12] Usually 6–10 biopsy specimens are obtained under fluoroscopic guidance. However fluoroscopic guidance is not mandatory in patients with diffuse parenchymal disease.

Pneumothorax and haemorrhage are the most commonly encountered complications following TBB with incidence of up to 3% of cases.[13] Renal insufficiency (BUN >30mg/dL and creatinine of >3 mg/dL), coagulapathies and pulmonary hypertension are considered the risk factors for bleeding following TBB[14]. TBB can be safely performed while patients are receiving aspirin as non-steroidal anti-inflammatory drugs. However, use of Clopidogrel bisulfate should be withheld for at least 5–7 days before the procedure.[15,16]

This study was carried out with an aim to know the diagnostic yield of bronchoscopy in our setup.

MATERIAL AND METHODS

This was a hospital based cross-sectional descriptive study conducted at Department of Pulmonology Ayub Medical College, Abbottabad, from Sep 2011

to Jan 2013. The hospital receives a majority of patients from Hazara division. All those patients in whom there was an indication of bronchoscopy were included in the study. Only those patients who were hemo-dynamically unstable, who refused to undergo the procedure, had recent MI or any acute severe illness and with bleeding disorders were excluded from the study.

After an overnight fast and taking an informed consent, bronchoscopy was performed through nasal route. Supplemental oxygen was administered only when SaO_2 dropped to less than 88%, prior to or during bronchoscopy, lesions were biopsied and sent for histopathology. Data was recorded on a *pro forma*, later on entered and analysed using SPSS-16.0.

RESULTS

A total of 237 patients were included in the study. Out of 237 patients, 152 (64%) were males and 86 (36%) females. Majority of patients were above 50 years (75%) of age and the rest were 25–39 years.

Out of 237 patients, only 108 patients were biopsied, as the rest had no endobronchial mass. One patient had mass in trachea, 7 patients had lesion within 2 cm of carina, 61 had lesions in the main bronchi more than 2 cm distal to carina and 37 had lesion in the segmental bronchi. Transbronchial lung biopsy was done in patients who were suspected to have diffuse parenchymal lung disease mainly interstitial lung disease. Two patients among 108 had transbronchial lung biopsy.

Malignancy was confirmed in 52 (48%), benign lesions in 53 (49%) and non-diagnostic biopsies in 3 cases, on the basis of histopathology. Among non-diagnostic cases two had endobronchial lesion at the level of segmental bronchus and one had diffuse parenchymal lung disease. Re-bronchoscopy and biopsy were planned but the patients did not comply.

Among the malignant lesions, squamous cell carcinoma was 38%, adenocarcinoma 31%, small cell carcinoma 25%, large cell carcinoma 4% and tracheal spindle cell tumour in 2%. Among benign lesions .chronic non-specific inflammation was present in 57%, caseating granuloma in 10%, chronic granulomatous inflammation in 31% and alveolar proteinosis in 2%.

DISCUSSION

FOB has important role in diagnosis, treatment and monitoring of chest diseases. Direct visualized endobronchial biopsies (EBB), transbronchial biopsies (TBB) and bronchial washings are considered standard procedures with flexible bronchoscopy. Moreover the diagnostic capabilities of flexible bronchoscopy have been markedly increased because of development of ultrathin bronchoscope and bronchovideoscope.[17] FOB is minimally invasive procedure with high diagnostic yield and 94% cases with clinical impression of bronchogenic carcinoma can be diagnosed.[18]

In this study, non-diagnostic biopsy was only 3%. Chronic granulomatous inflammation plus caseating granuloma were high in contrast to some western studies. This is probably due to high incidence of Tuberculosis in this part of world. Also in this study, squamous cell carcinoma was high (38%) as compared to adenocarcinoma (31%). This was comparable with the study conducted by Parsad *et al*.[19] In the USA, adenocarcinoma followed by squamous cell carcinoma is the most common histological subtype of lung cancer.[20]

In our study, we diagnosed two rare diseases i.e., pulmonary alveolar proteinosis and spindle cell tumour of trachea. Pulmonary alveolar proteinosis is a rare disorder characterized by alveolar filling with a lipid rich proteinacious material (positive to PAS stain). Its incidence is 0.2–0.5 new cases per 1000,000 persons each year and its prevalence is 2–6 cases per 1000,000 persons.[21]

The limitations of our study are the small sample size.

CONCLUSION

Fiberoptic bronchoscopy plays an important role in the diagnosis of common and rare diseases. However biopsy specimen should be adequate as tiny pieces may not give a proper diagnosis.

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