Original Research Article

Diagnostic bronchoscopy: an experience in a hospital of limited resources

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ABSTRACT

Background: Diagnostic bronchoscopy is conventionally performed in evaluating undiagnosed abnormal chest x-ray findings, undiagnosed haemoptysis, pleural effusion, unexplained cough and collapse of lung etc. One indispensable use currently is for diagnosis of lung cancer. The aim of the study was to study the various types of patients who have undergone Diagnostic Bronchoscopy in a hospital of limited resources and the diagnostic outcomes of the procedures.

Methods: A retrospective study of Bronchoscopies was done from October 2016 to January 2018, in Department of Respiratory Medicine in the hospital of a Medical College. All 178 patients of all age and any sex were included in the study. These patients present in the study had chest X-ray and CT scan of thorax. Other investigations done were ZN stains for AFB and CBNAAT-TB (Cartridge Based Nucleic Acid Amplification Test) for sputum and blood complete haemogram, prior to bronchoscopy.

Results: Our study has shown that Diagnostic bronchoscopy is particularly useful in diagnosis of lung cancer, sputum smear negative Tuberculosis, if proper selection of cases is done even in a centre of limited resources. It has become an absolute necessity in a medical college hospital.

Conclusions: Bronchoscopy in our resource limited set up shows that it is an indispensable tool for diagnosis of lung cancer with patients with clinical presentations of lung collapse, unresolved consolidation, lung masses, undiagnosed pleural effusions and haemoptysis. The usefulness can be much better if facilities like TBNA, EBUS are made available.

Keywords: Bronchoscopy, Bronchoalveolar lavage, Diagnostic bronchoscopy

INTRODUCTION

Bronchoscopy has been a procedure widely used in diagnostic and therapeutic process of various lung disorders. Various developments have taken place in the field of bronchoscopy since the development of flexible bronchoscopy by Ikeda et al. Finer scopes and higher resolutions have been developed in the recent years.1 Fluorescent bronchoscopy, EBUS (Endobronchial ultrasound) and EBUS-TBNA (Transbroncheal needle aspiration), in addition to conventional direct vision biopsy, BAL (Bronchoalveolar Lavage) study, has become essential measures enhancing diagnostic yields, in better equipped hospitals.2 However, routine viewing of tracheobronchial tree, bronchial washings, BAL and direct vision biopsy are still of immense usefulness in a resource limited hospital like authors’ in a remote area.

The diagnostic bronchoscopy is recommended in unexplained prolonged cough, wheezing in non-asthmatics or in asthmatics poorly responding to conventional treatment.3,4 Some cases of stridor or vocal
cord paralysis caused by intrathoracic lesions lower down may also necessitate further study by bronchoscopy. Patients with haemoptysis which is persistent or brisk and large in volume, besides cases with high suspicion for lung cancer will also get benefitted immensely by this procedure.\(^3\) Non-resolving pneumonia cases should also undergo bronchoscopy.\(^5\) Cavitary chest lesions or lung abscesses may sometimes turn out to be caused by lung cancer or sometimes co-existence of lung cancer with chronic scarring disease like Tuberculosis.\(^7\) Diagnostic bronchoscopy is also indicated in collapse lung cases as the cause may be endobronchial growth.\(^8\) Cases of undiagnosed persistent pleural effusion may be advised for bronchoscopy as these cases have high chance of malignancy.\(^9,10\) Lung nodules, lung masses and hilar adenopathy also warrant further evaluation by bronchoscopy.\(^11,12\)

India is still having high prevalence of Tuberculosis cases including multi-drug resistant forms and extensively drug resistance. BAL study for ZN Acid Fast Bacilli and CBNAAT-TB is very useful for detecting sputum smear negative Tuberculosis and multi drug resistant cases.\(^13\)

Trans-bronchial needle aspiration (TBNA) especially aided by Endobronchial ultrasound (EBUS), popularly known as EBUS-TBNA definitely helps a bronchoscopist in diagnosing submucosal lesions or lesions causing extrinsic compressions of the bronchus and mediastinal lymph nodes.\(^14\) This process also is useful for lung cancer staging.\(^15\) EBUS-TBNA definitely increases the diagnostic yield more than forceps biopsy alone for mucosal lesions and intraluminal growths under direct vision.\(^16\) However, in our resource limited centre without EBUS-TBNA facility still is very useful for diagnosis of diseases like lung cancer and Smear or CBNAAT negative tuberculosis. Common procedures in this centre in bronchoscopy are bronchoalveolar lavage, bronchial washing, bronchial brushings and forceps biopsy of mucosal and intraluminal lesions.

In many modern bronchoscopy centres, usefulness is significant for evaluation for diagnosis in sarcoidosis and interstitial lung diseases.

The type of clinical illnesses referred for Bronchoscopy and selected for bronchoscopy in a set up like ours is different from what is experienced in larger cities of India and developed countries of the world.

Aim of the study was to study clinical presentations of patients who had undergone bronchoscopy in the hospital and the diagnosis observed after bronchoscopy in each case, retrospectively.

METHODS

A retrospective analysis of all the bronchoscopy procedures was done in the Hospital from October 2016 to January 2018. The brief salient clinical presentations recorded in the Bronchoscopy Register were studied with post-bronchoscopy reports mentioned against each case.

All the procedures were done after proper selection by studying the clinical features, pleural fluid analysis reports for patients having pleural effusions, sputum for Acid Fast Bacilli, sputum for CBNAAT-TB and radiological findings like chest x-ray and CT- scan.

All the bronchoscopy procedures were performed with patient in supine position, with Xylocaine as topical anaesthesia, 10% Xylocaine spray for the upper airways, 5% Xylocaine ointment for the nostril just before the introduction of Bronchoscopy and 4% Xylocaine spurts through working channel on ‘as you go basis’ at the entry of vocal cords, carina, as per American College of Chest Physicians Consensus Statement.\(^18\) No sedation or atropine injection were used the procedures. Vital signs like pulse rate, blood pressure and SaO\(_2\) (arterial oxygen saturation) were monitored while the bronchoscopy was performed. Informed consent was obtained for each patient prior to the procedures. During bronchoscopy, observation of airways, bronchial washings, Bronchoalveolar lavage and forceps biopsy of affected lesions were done, while video recording of the whole procedures were done.

RESULTS

All the records of bronchoscopy procedures, clinical profiles and reports for the 178 patients from October 2016 to January 2018, recorded in the bronchoscopy register were studied retrospectively.

Among the 178 patients who had bronchoscopy done, 91 were males and 87 were females and all belong to age of 21 to 89 years of age.

Table 1: Clinical profiles of patients for which bronchoscopy were done (n=178).

<table>
<thead>
<tr>
<th>Clinical condition</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collapse lung</td>
<td>42</td>
<td>(23.6)</td>
</tr>
<tr>
<td>Un-resolving consolidation</td>
<td>51</td>
<td>(28.7)</td>
</tr>
<tr>
<td>Lung mass</td>
<td>70</td>
<td>(39.3)</td>
</tr>
<tr>
<td>Undiagnosed pleural effusion</td>
<td>8</td>
<td>(4.5)</td>
</tr>
<tr>
<td>Undiagnosed haemoptysis</td>
<td>7</td>
<td>(3.9)</td>
</tr>
</tbody>
</table>

Out of the patients (n=42) having collapse lung, 9 (21.4%) have been reported having lung cancer alone, 12 (4.4%) as Tuberculosis, 1 (2.4%) as having lung cancer with TB and remaining 24 (57.1%) as Inflammation/inconclusive and 7 (16.7%) as inadequate sample. Among 51 un-resolving consolidation cases 2 (3.9%) were reported to be having lung cancer, 5 (9.8%) as Tuberculosis, 3 (9.8%) as Pneumonia, 2 (3.9%) as Lung cancer with TB and 37 (72.5%) as Inflammation/inconclusive. 14 (20%) cases are reported as having lung cancer, 2 (2.9%) as pneumonia, 1 (1.4%)
as tuberculosis and 53 (75.7%) as inflammation/inconclusive, among the total of all lung mass presentations (n=70). In the group of cases of undiagnosed Pleural effusion (n=8), 2 (25%) turned out to be of lung cancer (adenocarcinoma) in report and 6 (75%) as Inflammation/inconclusive. The bronchoscopy reports of the undiagnosed haemoptysis cases (n=7) were 1 (14.2%) pneumonia, 1 (14.2%) tuberculosis, 1 (14.2%) lung cancer and remaining 4 (57%) Inflammation/inconclusive reports.

Table 2: Bronchoscopy reports (n=178).

<table>
<thead>
<tr>
<th>Reports</th>
<th>n  (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung cancer alone</td>
<td>28 (15.7)</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>8 (4.5)</td>
</tr>
<tr>
<td>Lung cancer with tuberculosis</td>
<td>3 (1.7)</td>
</tr>
<tr>
<td>Inflammation/inconclusive</td>
<td>124 (69.7)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>8 (4.5)</td>
</tr>
<tr>
<td>Sample inadequate</td>
<td>7 (3.9)</td>
</tr>
</tbody>
</table>

Among the 17 patients diagnosed with Adenocarcinoma, 10 were male and 7 were female patients. Seven were males and 5 were females in the reports of Squamous cell carcinoma group. All the 2 patients diagnosed with Small cell carcinoma were males.

Table 3: Types of lung cancer in reports (n=31).

<table>
<thead>
<tr>
<th>Type of lung cancer</th>
<th>n  (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenocarcinoma</td>
<td>17 (54.8)</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>12 (38.7)</td>
</tr>
<tr>
<td>Small cell carcinoma</td>
<td>2 (6.5)</td>
</tr>
</tbody>
</table>

Among the patients diagnosed as having lung cancer, 1 (3.6%) patient had undergone bronchoscopy twice after an interval of 1 month as the first procedure did not result in any conclusion, but the clinical feature was strongly suggestive of lung cancer and it was decided to have a repeat Bronchoscopy.

DISCUSSION

Bronchoscopy has become a necessity in every hospital having Department of Pulmonary Medicine and it is no longer a luxury. In this retrospective study clinical conditions with suspicion of malignancy like collapse lung, non-resolving consolidation on radiological investigation, undiagnosed pleural effusion and haemoptysis are the main indications for Bronchoscopy. Conditions like collapse lung is having higher yield in bronchoscopy for lung cancer, getting 21.4% yield among all the cases of lung collapse, which was caused by intraluminal growth of lung cancer. Fein AM et al, reported 12 out of 14 (86%) patients having diagnostic yield in patients of non-resolving pneumonia, which higher than finding in present study, although number of patients is higher in the present study.

In more advanced centres with better resources, TBNA (Trans bronchial Needle Aspiration) for diagnosis of sarcoidosis with combination of EBUS (Endobronchial Ultrasound) is having higher sensibility. In another study commonest indications were haemoptysis and bronchogenic carcinoma followed by pulmonary infection and sarcoidosis. BAL is very useful as observed in this study, as a tool for detection of sputum smear negative Tuberculosis, as observed in other studies. Authors have subjected the BAL samples for CBNAAT-TB study, which had helped in finding Tuberculosis existing with lung cancer. The yield of Tuberculosis from BAL study was 5 (2.8%) out of total Bronchoscopy cases (n=178), as all the cases were already screened by sputum CBNAAT-TB and got negative in the said test except one, hence being lesser from other studies showing yields in 48-73%. Coexistence of TB with lung cancer was observed in 3 (1.7%) cases out of total bronchoscopies (n=178) in present study, which is similar to one study.

BAL, bronchial brushing, bronchial washing and forceps biopsy under direct vision helped in the yield for detection of lung cancer in the present study, the yield was observed in 31 (17.4%) cases out of total bronchoscopy cases (n=178). The yield was 31.11% in one study and upto 11% in another study by Johnson JL et al.

CONCLUSION

Bronchoscopy in a resource limited set up shows that it is an indispensable tool for diagnosis of lung cancer with patients with clinical presentations of lung collapse, unresolved consolidation, lung masses, undiagnosed pleural effusions and haemoptysis. The usefulness can be better if facilities like TBNA, EBUS are made available, for detection of other respiratory diseases. It is of great help in diagnosis of sputum smear negative and even sputum CBNAAT-TB negative tuberculosis. It is the experience and wisdom of the treating physician to suspect TB in diagnosed lung cancer cases and lung cancer in established pulmonary tuberculosis cases, leading to subjecting these cases judiciously to procedure of bronchoscopy.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES