

FIBREOPTIC BRONCHOSCOPY - A MALAYSIAN EXPERIENCE

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ABSTRACT

Two hundred and ninety-three bronchoscopies were done for 285 patients (78% males, 22% females) at Hospital Universiti Sains Malaysia between 1984 and 1988. The mean age was 56.4 years (range 13 to 90 years). 70.2% of patients underwent bronchoscopies to confirm or exclude the diagnosis of carcinoma of the bronchus, out of which 58% were confirmed to have bronchial carcinoma. 77% of the 98 patients with visible endobronchial tumours had biopsy specimens diagnostic of malignancy. Brushing and washing cytology increased the positive yield to 92%. The commonest histological type of bronchial carcinoma identified was squamous cell carcinoma (48.1%), followed by small cell carcinoma (27.1%), anaplastic/undifferentiated carcinoma (12.9%), adenocarcinoma (9.4%) and large cell carcinoma (2.4%). Bronchoscopy for the investigation of haemoptysis identified the commonest cause as 'bronchitis'. There were no complications noted in our series. Notable differences of our experience compared to that of the western series were the high percentage of bronchoscopy done for infective respiratory disorders and the younger age of our patients.

Keywords: Bronchoscopy, bronchogenic carcinoma, Malaysia.

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INTRODUCTION

Fibreoptic bronchoscopy was introduced by Ikeda in the late 1960s⁽¹⁾ and the procedure is a major advance in diagnosing pulmonary diseases. The results obtained compare favourably with rigid bronchoscopy and in many hospitals, fibreoptic bronchoscopy has largely superseded rigid bronchoscopy^(2,3). This procedure is more acceptable because there is minimal risk and discomfort to the patient. The greater visual range allows a larger area of the bronchial tree to be seen, down to subsegmental level and beyond^(4,5). Though the biopsy specimen obtained is smaller, it gives a higher rate of accurate histological diagnosis⁽⁶⁾.

This paper describes a five year experience of flexible fibreoptic bronchoscopy done at Hospital Universiti Sains Malaysia (HUSM), a teaching hospital in the north east of Peninsular Malaysia.

MATERIALS AND METHOD

The results of fibreoptic bronchoscopies done at HUSM during the period April 1984 to December 1988 were reviewed.

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Bronchoscopies were done using an Olympus fibreoptic bronchoscope (Model BFP10 for children and Model BF3BR for adults). Premedication with intramuscular atropine was given half an hour before the procedure. No sedation was used for the majority of patients but intravenous diazepam 5 - 10 mg or domperidone 3 - 5 mg were used in a small number of anxious patients. 10% xylocaine spray was given to the nose and nasopharynx and 2% xylocaine solution was sprayed to the vocal cord and tracheo-bronchial tree. Xylocaine gel was used as a lubricant and an anaesthetic. Oxygen was given through a nasal canula during the examination. The instrument was introduced transnasally and all segmental orifices were inspected unless a tumour was obstructing. Biopsy was done on visible endobronchial lesions.

No transbronchial biopsy or bronchoalveolar lavage was performed. Bronchial brushings and washings were collected for cytology and for culture and sensitivity. Culture for mycobacteria or fungus was done in selected cases.

RESULTS

Two hundred and ninety three bronchoscopies for 285 patients were done during the period of study. Bronchoscopies were done twice in five cases in which there were visible endobronchial tumours but biopsy/cytology were negative for malignancy. In all these patients, histology was positive for malignancy in the repeat procedure. In the other three patients, repeat bronchoscopies were done because there was a high degree of clinical suspicion of malignancy but the repeat bronchoscopy also did not produce a positive yield for malignancy.

Table I shows the age and sex distribution of patients who underwent fibreoptic bronchoscopy. There were 222 men (78%) and 63 women (22%). The youngest patient was a 13-year old girl and the oldest patient was a 90-year old man; both cases had slowly resolving pneumonia. The mean age of the patients was 57.4 years and the majority of the patients (77.3%) were in the age range of 41 to 80 years.

The diagnosis made before bronchoscopy and their frequency distribution is shown in Table II. Sixty eight percent of bronchoscopies were done to confirm or rule out the possibility of carcinoma of the bronchus. The next most common indication was for the investigation of haemoptysis, followed by unresolved pneumonia and for suspected pulmonary tuberculosis. Bronchoscopies were performed for interstitial lung disease in only two cases.

Table I
Age and Sex Distribution

Age (years)	Sex		Total	%
	Male	Female		
< 20	7	5	12	4.8
21-30	16	4	20	7.5
31-40	20	4	24	8.2
41-50	34	16	50	17.4
51-60	52	14	66	22.8
61-70	53	12	65	22.8
71-80	34	7	41	14.3
> 80	6	1	7	2.4
Total	222 (77.8%)	63 (22.2%)	285	100.0

Table II
Diagnosis Before Bronchoscopy

Diagnosis	No. of cases	%
Carcinoma/ Possible carcinoma	200	68.3
Haemoptysis	34	11.6
Unresolved pneumonia	28	9.5
Bronchiectasis	4	1.4
Tuberculosis	17	5.8
Others*	10	3.4
Total	293	100.0

* chronic cough - 1, haemothorax - 1, pulmonary fibrosis/fibrosing alveolitis - 2, mediastinal mass/lymphoma - 2, foreign body - 2, metastatic carcinoma with possible primary in the lung - 2.

Carcinoma of the Bronchus

The most common indication for bronchoscopy was to diagnose or exclude carcinoma of the bronchus. Two hundred bronchoscopies (68%) were performed for this reason. Abnormal bronchoscopic findings were found in 184 (92%) cases including 98 cases which had visible endobronchial tumours. Seventy-five (77%) of these cases with visible tumours had positive biopsy for carcinoma. Brush biopsy and washing cytology increased this yield to 92%. Overall, 117 patients were subsequently shown to have bronchial carcinoma including 3 of 78 patients who had 'normal' bronchoscopic findings.

The distribution of histology/cytology results for the 117 confirmed cases of bronchial carcinoma is shown in Table III. In 31 cases, malignant cells of unspecified classification were identified. The commonest identifiable type of tumour was squamous cell carcinoma (48.1%), followed by small cell (oat cell) carcinoma (27.1%), anaplastic/undifferentiated carcinoma (12.9%), adenocarcinoma (9.4%) and large cell carcinoma (2.4%). Secondary carcinoma, the primary of which was in the thyroid gland, was found in one case.

Haemoptysis

The second most common reason for bronchoscopy was for the investigation of the cause of haemoptysis (excluding those cases with clinical or radiological suspicion of carcinoma or active tuberculosis. Thirty four patients (11.9%) underwent

Table III
Histological Type Of Bronchial Carcinoma

Histological Type	No.
Squamous cell	41
Small cell	23
Adenocarcinoma	8
Large cell	2
Undifferentiated/Anaplastic	11
Secondary (thyroid)	1
Not classified	31
Total	117

bronchoscopy for this reason, 25 of whom had normal chest X-ray. In the others, the chest X-rays showed features of 'old' tuberculosis in four patients, bronchiectasis in two patients, pneumonia in two patients and foreign body in one patient.

Bronchoscopy was normal in 11 patients (32%). The abnormal findings included non specific inflammatory changes, suggestive of infections or bronchitis in 12 patients, bronchiectasis in three patients, tuberculous fibrosis in three patients, mucosal bleeding in three patients and bleeding from inflammation of the upper respiratory tract in two patients. No bronchoscopic findings of active tuberculosis or carcinoma were detected.

DISCUSSION

Since its introduction by Ikeda in the 1960s⁽¹⁾, flexible fiberoptic bronchoscopy has largely replaced rigid bronchoscopy in the investigation of diseases of the chest. This procedure has been available in the Hospital Universiti Sains Malaysia since the hospital was opened in 1984. Our experience with the procedure showed many similarities with that of the western reports but also showed a few differences.

The mean age of the patients was 57.4 years. This is less than that in the western series in which the majority of patients were between 60 to 80 years old^(6,7). Seventy-eight percent of the 285 patients who had undergone bronchoscopies were males. This figure is similar to other reports^(6,7). A possible explanation is the higher occurrence of bronchial carcinoma in males.

In spite of the increasingly wide applications of fiberoptic bronchoscopy, most bronchoscopies are still undertaken for suspected malignant disease. McDonald⁽⁶⁾ reported that 93% of bronchoscopies were performed to diagnose or exclude carcinoma of the bronchus. In our study, only 67% of bronchoscopies were performed for this indication. This is because a higher proportion of bronchoscopies were done for infective conditions of the lungs such as pneumonia, bronchiectasis and tuberculosis.

It has been shown that the overall rate of positive biopsy specimens for visible tumours taken by flexible bronchoscope is similar to that obtained by a rigid instrument even though the biopsy specimen taken is smaller. However, a higher percentage of positive biopsy specimen is achieved with the fibrescope because many more tumours are visible, particularly those in the upper lobes⁽⁸⁾. Several series⁽⁹⁻¹²⁾ have shown that when tumours are visible at bronchoscopy, an accurate histological diagnosis can be made in about 77-90% of the cases. In one series, Martini and McCormick⁽¹¹⁾ found 37% of the cases having visible tumours, out of which 93% gave positive biopsy specimen. Mitchell et al⁽⁹⁾ found 48% had visible tumour with 91% positive specimen. Kvale et al⁽¹²⁾ on the other hand found 75% of cases to have visible tumours with only 71% positive biopsy specimen.

In our series, 53% of the cases had visible tumour and of these, 77% had positive biopsy specimen. As expected, when no tumour is visible directly, the positive biopsy rate is lower, and in our series it was only 18%. Bronchial brushing and washing cytology increased the diagnostic yield of our series to 92%. The importance of combining forceps biopsy with brush cytology to increase the diagnostic yield has been emphasised by others^(11,12).

Fibreoptic bronchoscopy is particularly useful when investigating patients with haemoptysis. The greater visual range of the fibrescope allows more accurate locating of peripheral causes of haemoptysis⁽⁵⁾. It has been shown that the source of haemoptysis can be localised to a segmental or subsegmental level in more than 90% of cases⁽¹⁴⁾. Locating the site of bleeding is particularly important in massive haemoptysis where emergency surgical resection may be necessary. In two of the series reported^(13,14), the commonest causes of haemoptysis were chronic obstructive airway disease, bronchiectasis, bronchial carcinoma and tuberculosis. However, in many cases no cause was found. In our series, out of the 34 cases that presented with haemoptysis as the only symptom, no cause was found in 11 patients (32%). In the remaining 14 patients, 12 had bronchitis, 3 bronchiectasis, 3 tuberculous fibrosis and 5 mucosal bleeding. There were no cases of carcinoma or active tuberculosis detected from this group of patients.

Complications arising from the use of the fibrescope is very low, partly because general anaesthesia is not necessary. In a large multicentre series⁽¹⁵⁾, the incidence of minor complications was 0.2% and of major complications 0.08% with a mortality of 0.01%. Adverse reactions to local anaesthesia have been reported. A fall in arterial oxygen tension of 1.3 kPa (9.8 mm Hg) or more often occurs and this can be readily counterbalanced if oxygen is given through a nasal cannula during the examination. In this regard, lignocaine seems to be the safest local anaesthetic for bronchoscopy. Other reported complications include laryngospasm after unskilful insertion of the bronchoscope, bronchospasm in asthmatics and fever⁽¹⁶⁾. Major complications may occur if transbronchial lung biopsy is done. Haemorrhage (9%) and pneumothorax (5%) have been reported⁽¹⁷⁾. In our series

of 293 bronchoscopies, there were no major nor minor complications recorded. The reason for this finding is partly because no transbronchial biopsy or bronchoalveolar lavage was performed.

In conclusion, our experience with fibreoptic bronchoscopy has many similarities with those from the western series. Notable differences were the higher rate of bronchoscopies done for infective lung conditions and the younger ages of our patients.

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