Rigid Versus Flexible Bronchoscopy in the Diagnosis of Carcinoma of the Lung

Nazar B. Elhassani*, Qais Mohammad Ali**

ABSTRACT:

OBJECTIVE:

The aim of the study is to evaluate the role of both the flexible and the rigid bronchoscopy in the diagnosis of carcinoma of the lung according to our present experience.

METHODS:

192 cases of carcinoma of the lung in whom diagnosis was established histopathologically or cytologically and for whom bronchoscopy, rigid or flexible was performed to establish diagnosis or to assess operability, have been studied.

RESULTS:

Out of the 104 patients examined by flexible bronchoscopy, histopathological or cytological diagnosis was established in 72 patients (69.23%). Intrabroncheal tumor was visualized in 52 patients (50%). Biopsy was taken in 49 out of these 52 patients and was positive in 43 patients (87.75%).

Out of the 88 patients examined with rigid bronchoscopy histopathological or cytological diagnosis was established in 62 patients (70.45%). Intrabroncheal tumor was visualized in 40 patients (45.45%). Biopsy was taken in all these 40 patients and it was positive in 39 patients (97.5%).

CONCLUSION:

The study showed that the two modalities of bronchoscopy were safe and almost with the same diagnostic capability, with the flexible bronchoscopy having more extended scope of vision while the rigid one having better and more accurate biopsies.

KEY WORDS: bronchoscopy, flexible bronchoscopy, rigid bronchoscopy, carcinoma of the lung

INTRODUCTION:

Lung cancer is the leading cancer-related death all over the world [(1)]. It is a serious health problem in most countries of the world. In Iraq, it should be considered a high priority problem of the need for expanded facilities for detection, early diagnosis and control [(2)].

Till now, surgery is the only therapeutic option with cure potential in treating patients with carcinoma of the lung [(3)]. The most significant factor which determines the survival of newly-diagnosed patients with lung cancer is the stage at which the disease has been diagnosed [(4)]. Unfortunately, most of the patients with carcinoma of the lung present in inoperable stages out of the scope of resection [(5)] . Early diagnosis is important to treat patients in the early stages to perform successful resection and give chance for cure [(6)]. Delay of diagnosis and hence of surgery will deprive the patients from their chance for cure. The British thoracic society recommends that no longer than four weeks should pass from the moment of diagnosis until surgery takes place [(7)].

Bronchoscopy is one of the most important investigations in cases of carcinoma of the lung. It helps in establishing histopathological or cytological confirmation of the diagnosis of carcinoma of the lung. It is also important for staging which is important for assessment of operability and hence in establishing the proper modality of treatment. It is also important for assessment of the prognosis of the patient [(4)].

Bronchoscopy is a simple and safe procedure but when an accident occurs, serious complications may arise with devastating rapidity [(8)].

PATIENTS AND METHODE:

104 patients (54.16%) had undergone flexible bronchoscopy (Table 1). Their age group ranged between 35- 80 years, with male to female ratio of 26:1.

88 patients (45.84%) had undergone rigid bronchoscopy (Table 1). Their age group ranged 35-80 years with male to female ratio of 7.8:1.

General anesthesia was used for the rigid bronchoscopy while local anesthesia was used for the flexible bronchoscopy.

RESULTS:

Out of the 104 patients examined with the flexible bronchoscope, histopathological or cytological diagnosis was established in 72 patients (69.23%). (Table 2 @ 3)

Intra-bronchial tumor was visualized in 52 patients (50%).Biopsy was taken in 49 patients only. In three

* Professor and Chairman, Department of Thoracic Surgery, Medical College, Baghdad University

** Lecturer of Thoracic Surgery, Medical College, Almustansyria University

patients it was not taken because of the high risk of bleeding. Positive histopathological results were yielded in 43 patients out of these 49 (87.75%). Bronchial wash and brush was taken from all these 52 patients and it was positive in 47 patients (90.38%).

In 29 patients (27.88%), features suggestive of malignancy were visualized, but no definite intra bronchial tumor could be identified. Such features included areas of dilated capillaries, thickened edematous or infiltrated mucosa and distorted bronchial tree. Biopsy was taken in 5 patients only and it was negative in all of them. Bronchial wash and brush was taken in all the 29 patients and it was positive only in 20 patients (68.96%).

Normal tracheo-bronchial tree was reported in 23 patients (22.12%). Bronchial wash and brush was taken in all of these patients and it was positive in 5 patients only (21.73%). (Table 2)

Out of the 88 patients examined with the rigid bronchoscope, histopathological or cytological diagnosis was established in 62 patients (70.45%). (Tables 2 @ 4)

Out of these 88 patients, definite tumor was visualized in 40 patients (45.45%). Biopsy, wash and brush were taken in all of these patients. The biopsy yielded positive results in 39 patients (97.5%). The wash and the brush were positive in 38 patients (95%). In combination positive results were yielded in all of these patients (100%).

In 22out of the 88 patients (25%) there were features suggestive of malignancy but no definite intra-bronchial tumor. Bronchial wash was taken from all of these patients and it was positive in 12 patients (54.54%). Biopsy was taken in 6 patients but was negative in all of them.

In 26 out of the 88 patients (29.55%) normal trcheo-broncheal tree was reported. Bronchial wash was taken from them and it was positive in 10 patients (38.46%).

No mortality or significant morbidity was registered in all of the patients with both types of bronchoscopy.

DISCUSSION:

Sensing the obvious desirability of extending the usual limits of physical examination, Bozzini in 1896 created a primitive endoscopic instrument utilizing a wax candle as a light source. In 1897, Gustave Killian (the father of bronchoscopy) used an external light source and a head mirror to remove an aspirated pork bone from a 63-years-old farmer under cocaine anesthesia. In 1898 Algernon Coolidge Jr. removed an aspirated foreign body using an open urethroscope and sunlight reflected off a head mirror. In 1902, Einhorne produced an endoscope with a tip-illumination. In 1904, Chevalier Jackson incorporated suction at the end of a tip-illuminated bronchoscope. In 1967 Ikeda introduced the first flexible bronchoscope [9], and since then, many recent developments have been achieved. One of these developments is fluoroscopy guided bronchoscopy. This is a safe and routine method used to obtain a histologic or cytologic specimen of peripheral lung nodule [(10).] Rapid on site cytological examination (ROSE) is an effective reinforcement to this technique to increase its diagnostic yield [10] especially in cases where it is difficult to obtain histologic examination [(11)].

The role of cytopathology in the diagnosis of bronchogenic carcinoma is great despite few false positive or false negative results [(12)].

Autoflourecenc bronchoscopy (AFB) was proved beneficial in bimodality surveillance to detect lung cancer early in high risk patients [13, 14]. It can be used with thin slices CT scan [(13)] or spiral CT scan [(14)]. AFB utilizes inherent tissue properties to identify preinvasive lesions of the central air ways [(15)]. Recent lung cancer screening studies have led to the detection of an increasing number of very early non small cell lung carcinomas (defines as less than 2cm in size) and of good prognosis [(15)].

Endobroncheal ultrasonography (EBUS) can be applied with the flexible bronchoscope to increase its diagnostic yield [(16)].

Electromagnetic navigation is accurate and safe in the localization of peripheral lung lesions and may help to increase the yield of diagnostic bronchoscopic procedure [(17)].

Noninvasive multiraw detector CT virtual bronchoscopy enables high resolution endoluminal imaging of the air way down to the segmental bronchi [(18)] It is one of the most recent developments in the 3D technique which allows a 3D evaluation of the air ways down to the sixth to the seventh generation [(19)] but still it can never replace flexible bronchoscopy [(20)].

Transbronchial needle aspiration (TBNA) has proved its efficacy and safety in diagnosing and staging lung cancer [(21, 22)]. It increases the diagnostic yield and should be considered a valuable diagnostic tool, particularly in cases of submucous peribronchial lesions[(23)].

CONCLUSION:

1- Positive yield was almost equal in both modalities (70.45% for the rigid and 69.23% for the flexible).

2- The percentage of visible intra-bronchial tumor was higher in flexible bronchoscopy (45.45% for the rigid and 50% for the flexible). This might be due to the extended reach of the flexible bronchoscope.

3- For patients in whom definite intra-bronchial tumors were visualized, positive biopsies were more with rigid bronchoscopy (97.5% for the rigid and 87.75% for the flexible). This might be due to the bigger biopsies and the better field of visualization with the rigid bronchoscopy.

4- In patients with areas suspicious of malignancy but

with no visible intra- bronchial tumors, the results of biopsies were negative whether they were taken through rigid or flexible bronchoscopes. This indicates that accurate biopsy results need accurate localization of the tumor.

5- Bronchial washes or brushes gave good and almost equal results in both types of scopes.

In summary, with our experience both modalities are safe and with almost the same diagnostic capabilities, with the flexible bronchoscopy having more extended scope of vision while the rigid one having better and more accurate biopsies.

Table 1: Types of bronchoscopy used

Type of bronchoscope	No. of patients	No. of +ve results	% of ve results
Flexible	104	72	69.23%
Rigid	88	62	70.45%
Total	192	134	69.79%

Table 2: Macroscopic findings in cases of flexible bronchoscopy

Findings	No.	%
Visible intrabroncheal lesion	52	50%
Suspicious of malignancy	29	27.88%
Normal	23	22.12%
Total	104	100%

Table 3: Macroscopic findings in cases of rigid bronchoscopy

Findings	*No.*	%
Visible intrabroncheal lesion	40	45.45%
Suspicious of malignancy	22	25%
Normal	26	29.55%
Total	88	100%

Table 4: Results of histopathological and cytological examination in patients for whom flexible bronchoscopy was performed

findings	No. of patients	specimens	No. of specimens	No. of +ve	percentage
Visible intrabroncheal tumor	52	Biopsy Wash & Brush Combination	49 52 52	43 47 47	87.75% 90.38% 90.38%
Suggestive of malignancy No intrabroncheal tumor	29	Biopsy Wash & Brush Combination	5 29 29	Nil 20 20	Zero 68.96% 68.96%
Normal	23	Wash & Brush	23	5	21.73%
Total	104	Biopsy Wash & Brush Combination	54 104 104	43 72 72	79.62% 69.23% 69.23%

Table 5: Results of histopathological and cytological examination in patients for whom rigid bronchoscopy was performed

Findings	No. of patients	specimens	No. of specimens	No. of +ve	percentage
Visible intrabroncheal tumor	40	Biopsy Wash & Brush Combination	40 40 40	39 38 40	97.5% 95% 100%
Suggestive of malignancy No intrabroncheal tumor	22	Biopsy Wash & Brush Combination	6 22 22	Nil 12 12	Zero 54.54% 54.54%
Normal	26	Wash & Brush	26	10	38.46%
Total	88	Biopsy Wash & Brush Combination	46 88 88	39 60 62	84.17% 68.18% 70.45%

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