

Bronchogenic carcinoma in sample of Iraqi patients, Fiber optic bronchoscope findings

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Abstract:

Background: Lung cancer is the leading cause of cancer deaths and its incidence is rising. The determination of histopathology and stage of primary lung carcinoma is crucial to develop appropriate treatment approach that affects morbidity and mortality. Fiber optic bronchoscope techniques for early detection of lung cancer are a promising tool as they might allow visualizing changes of early lung cancer and also permitting sampling for histological confirmation.

Objective: This study was intended to compare the fiber optic bronchoscopy findings and their anatomical locations with the histopathology types in patients with lung cancer.

Patient and Methods: A cross section study was conducted during the period from 1st February 2012 to the 31th of July 2013, 49 patients with clinical and radiological findings suggesting primary lung cancer and diagnose later by bronchoscope samples as cases of primary lung cancer chosen for analysis of their bronchoscope findings, at Baghdad teaching hospital / respiratory clinic.

Results: Patients with squamous carcinoma (31%) had (67%) visible mass and (13%) presented invisibly as external compression. Patients with adenocarcinoma (41%) had (40%) visible mass and (35%) presented invisibly as external compression while normal bronchoscope was seen in (30%) of those patients so that adenocarcinoma mostly invisible. Patients with small cell carcinoma (28%) had (50%) visible mass and (21%) presented invisibly as external compression. The location of finding in (27%) of the patients with squam.

ous carcinoma was in the right main bronchus and (20%) in right upper lobe bronchus while the carina affected in (47%). Patients with adenocarcinoma have vocal cord affected in (25%) and left upper lobe bronchus lesion in (25%).

Conclusion: There was no relationship between the fiber optic bronchoscope findings and their anatomical locations with the histological types of lung.

Keyword: FOB:Fibro-Optic Bronchoscopic, BCA-Bronchogenic carcinoma.

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Introduction:

Lung cancer is the leading cause of cancer deaths and its incidence is rising [1]. It accounts for an estimated 1.4 million deaths globally that is, 18.4% of all cancer deaths [2]. Lung cancer is the most prevalent malignant tumor in the world. It was reported that one third of death related to cancer was result of lung cancer in America and Europe for a year [3]. In spite of all treatments including surgery, about 16% of lung cancer cases could survive for 5 years [4]. The determination of histopathology and stage of primary lung carcinoma is crucial to develop appropriate treatment approach that affects morbidity and mortality [5,6]. There has been a lot of screening tests for detection of early lung cancer using sputum cytology and chest radiograph have been used with limited success and also Low dose spiral computerized tomographic scan [7]. Bronchoscope techniques for early detection of lung

cancer are a promising tool as they might allow to visualize changes of early lung cancer and also permit sampling for histological confirmation [8]. Invasive methods widely using in histopathology diagnosis of lung cancer are bronchoscope mucosal biopsy, bronchial washing, bronchial brushing and transthoracic needle aspiration [6]. While the diagnostic rate of bronchoscope forceps biopsy alone in central tumor is from 65% to 82%, this rate

may be increased to around 90% with forceps biopsy combined with bronchial wash and / or bronchial brushing [9]. Factors that affect the success of diagnostic modality are diameter and localization of the mass and visibility at endobronchial tree with bronchoscope. The most prevalent diagnostic tool in the central and endobronchial lesion is bronchoscopy. Among these methods, bronchial wash alone was reported as the lowest success rate in diagnosis of central lesion 48% [6]. Central carcinoma of the tracheobronchial tree can generally be localized after a single inspection with the fiberoptic

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bronchoscope [10]. It has been reported to provide histologic diagnosis in between 60% to 80% of cases with no serious or rare complications [11,12,13]. Lung cancer is divided into non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC) according to World Health Organization (WHO) for histological classification of lung cancer for therapeutic planning [14,15,16]. The four main histological types include: adenocarcinoma, squamous cell carcinoma, SCLC and large-cell carcinoma [17].

Aims of the study: The objective of the study is to compare the fiber optic bronchoscopy findings and their anatomical locations with the histopathology types in patients diagnosed with lung cancer to determine the relationship between these findings.

Patients and Methods:

A cross sectional study, The study was conducted during the period from 1st February 2012 to the 31th of July 2013, forty nine patients with clinical and radiological findings suggestive of primary lung cancer and diagnosed later by bronchoscope samples as cases of primary lung cancer chosen for analysis of their bronchoscope findings, at Baghdad teaching hospital / respiratory clinic. Inclusion and Exclusion criteria: Patients include in this study who were clinically and radio logically suspected of having lung cancer with cytological and / or histopathology results for cancer were positive. Exclusion criteria include any patients with incomplete bronchoscope procedures, patients for whom cytological and histopathology results for lung cancer were negative, patient with results diagnosis other than lung cancer. On the basis of these criteria we collect forty nine patients where Bronchoscope procedures performed for all of them and the samples as bronchial washing, post bronchoscope sputum, bronchial brushing, bronchial biopsy and bronchoalveolar lavage were taken. The bronchoscope findings were categorized according to the classification of Ikeda et al, together with some of the criteria used by the Japan Lung Cancer Society in order to classify mucosal injury and secretion findings. Bronchoscope findings were also classified according to their location in the tracheobronchial tree (trachea, vocal cord, main carina, right main bronchus, right upper lobe bronchus, right middle lobe bronchus, and right lower lobe bronchus, left main bronchus, left upper lobe bronchus, Lingula and left lower lobe bronchus).

Data collection:

We collected data such as name, bronchoscope morphologic findings, anatomical location of endobronchial lesion, cytological and histopathology results. All specimens collected during the procedures were analyzed by the four pathologists from Baghdad College of medicine at laboratory department of Oncology teaching hospital at Baghdad medical city. The cytological and histopathology findings were classified as being

negative for, inconclusive for, suggestive of, or positive for malignancy. The findings that were classified as inconclusive were considered negative, whereas those classified as being suggestive of malignancy were considered positive. The histological and cytological classification of tumors was based on the criteria used by the World Health Organization.

Statistical analysis: Statistical package for social sciences version (20) was used for data input and analysis. Discrete variable presented as number and percentages. Chi square test for independence couldn't be used in statistical analysis due to small expected value in all the tables (<1).

Results

The (49) patients were evaluated for tumor histological type and the results as follow: adenocarcinoma found in 20 patients (41%), squamous carcinoma in 15 patients (31%) and small cell carcinoma in 14 patients (28%).

The Comparison between the fiber optic bronchoscopy findings with histological tumor types is seen in (Table 1). Patients with squamous carcinoma had (67%) visible mass and (13%) presented invisibly as external compression while internal narrowing had seen in (13%). Patients with adenocarcinoma had (40%) visible mass and (35%) presented invisibly as external compression while normal bronchoscope was seen in (30%) of those patients so that adenocarcinoma mostly invisible. Patients with small cell carcinoma had (50%) visible mass and (21%) presented invisibly as external compression while nodular mucosa had seen in (21%). The location of tumors or the abnormality as seen by the fiber optic bronchoscope compared with histological tumor types in (Table 2). The location of finding in (27%) of the patients with squamous carcinoma was in the right main bronchus and (20%) in right upper lobe bronchus while the main carina affected in (47%). Patients with adenocarcinoma have vocal cord affected in (25%) and left upper lobe bronchus lesion in (25%) while the right upper lobe bronchus was affected in (15%). In small cell carcinoma the location of bronchoscope finding was seen in the right upper and middle lobe bronchus in (29%) of the patients. The Comparison between locations of fiber optic bronchoscope findings in the two lungs with histological tumor types is seen in (Table 3). In squamous carcinoma patients the right lung was affected in (60%). Adenocarcinoma patients have right and left lung equally affected (35%). In patients with small cell carcinoma the right lung was affected in (71%).

Table (1) the distribution of cases according to fiber optic bronchoscope findings and histological types of tumors.

Findings	Squamous cancer 15 patients (31%)		Adenocarcinoma 20 patients (41%)		Small cell cancer 14 patients (28%)		Total in 49 patients	
	No	%	No	%	No	%	No	%
Mass	10	67%	8	40%	7	50%	25	51%
External compression	2	13%	7	35%	3	21%	12	25%
Internal narrowing	2	13%	5	25%	1	7%	8	16%
Abnormal carina	7	47%	4	20%	2	14%	13	27%
Abnormal vocal cord	1	7%	5	25%	1	7%	7	14%
Nodular mucosa	1	7%	2	10%	3	21%	6	12%
Mucosal ulcer	---	---	1	5%	---	---	1	2%
Mucosal congestion	11	73%	19	95%	13	93%	43	88%
Mucosal thickening	---	---	2	10%	---	---	2	4%
Abnormal secretions	7	47%	9	45%	3	21%	19	39%
Normal	---	---	6	30%	---	---	6	12%

Table (2) the distribution of lesions according to site of lesions in relation to airways and histological types of tumors.

Site of lesion	Squamous cancer 15 patients (31%)		Adenocarcinoma 20 patients (41%)		Small cell cancer 14 patients (28%)		Total in 49 patients	
	No	%	No	%	No	%	No	%
Right main bronchus	---	---	---	---	2	14%	2	4%
Right upper lobe bronchus	2	13%	1	5%	3	21%	6	12%
Right middle lobe bronchus	---	---	---	---	3	21%	3	6%
Right lower lobe bronchus	1	7%	2	10%	---	---	3	6%
Left main bronchus	2	13%	---	---	---	---	2	4%
Left upper lobe bronchus	2	13%	1	5%	1	7%	4	8%
Lingula	---	---	---	---	---	---	---	---
Left lower lobe bronchus	---	---	1	5%	2	14%	3	6%
Right middle & lower lobe bronchus	1	7%	1	5%	---	---	2	4%
Right main bronchus & main Carina	2	13%	1	5%	---	---	3	6%
Right main & upper lobe bronchus	---	---	1	5%	---	---	1	2%
Right upper lobe bronchus, Trachea, vocal cord & main carina	1	7%	1	5%	---	---	2	4%
Right main bronchus, trachea & main carina	2	13%	---	---	---	---	2	4%
Right upper, middle, lower lobe Bronchus & main carina	---	---	---	---	1	7%	1	2%
Right middle lobe bronchus & Vocal cord	---	---	---	---	1	7%	1	2%
Left main, upper, lingula Bronchus & main carina	---	---	1	5%	---	---	1	2%
Left main bronchus, vocal cord & main carina	---	---	1	5%	---	---	1	2%
left upper lobe bronchus & vocal cord	---	---	3	15%	---	---	3	6%
left upper lobe bronchus & main carina	1	7%	---	---	---	---	1	2%
Left main bronchus & main carina	1	7%	---	---	1	7%	2	4%
Main carina	---	---	---	---	---	---	---	---
Trachea	---	---	---	---	---	---	---	---
Vocal cord	---	---	---	---	---	---	---	---
Normal	---	---	6	30%	---	---	6	12%
Total	15	100%	20	100%	14	100%	49	100%

Table (3) the distribution of cases according to location of lesion in relation to lungs and histological types of tumors.

Site of lesion	Squamous cancer 15 patients (31%)		Adenocarcinoma 20 patients (41%)		Small cell cancer 14 patients (28%)		Total in 49 patients	
	Numbers	%	Numbers	%	Numbers	%	Numbers	%
Right lung	9	60%	7	35%	10	71%	26	53%
Left lung	6	40%	7	35%	4	29%	17	35%
Both lungs	---	---	---	---	---	---	---	---
Normal	---	---	6	30%	---	---	6	12%
Total	15	100%	20	100%	14	100%	49	100%

Discussion:

The main finding we observed that there was a higher incidence of adenocarcinoma in this sample of Iraqi patient’s study, which can be higher than the incidence of squamous carcinoma. A number of groups of authors reported an increase in adenocarcinoma incidence than the incidence of squamous carcinoma [18, 19, and 20]. In a recent report studied in the kingdom of Saudi Arabia also showed higher incidence of adenocarcinoma [21]. According to Shields, show higher incidence of adenocarcinoma [22]. In our study the incidence of adenocarcinoma was (41%) then squamous carcinoma (31%) and small cell carcinoma was (28%) and this result apposed other huge Iraqi study was show squamous carcinoma more than adenocarcinoma (26, 27, 28). We analyzed the histological types (squamous carcinoma, adenocarcinoma, small cell carcinoma, and large cell carcinoma) and correlated them with their location and endoscopic findings. Squamous carcinoma was most commonly located in the central region, and, on endoscopy, it was most commonly visualized as a tumor mass. Adenocarcinoma was most commonly located in peripheral areas and showed indirect findings, such as bronchial obstruction and external compression, which are bronchoscopy invisible, or no findings at all [23]. Comparing the three histological types with their bronchoscope findings, we demonstrated that an endobronchial mass is the most common bronchoscopy finding that is suggestive of squamous carcinoma, whereas external compression and normal bronchoscope are mostly suggest adenocarcinoma. In small cell carcinoma the most common finding was mass (Table1). These findings are in agreement with those reported by other authors [24]. Regarding the most prevalent lung cancer location, in squamous carcinoma the most commonly affected sites are carina, right main bronchus and right upper lobe bronchus. In small cell carcinoma the most commonly affected sites are the right upper lobe bronchus and right middle lobe bronchus. In adenocarcinoma the most commonly affected sites are left upper lobe bronchus and right upper lobe bronchus lesions and the vocal cord as secondary metastasis (Table 2). In both squamous cell and small cell carcinoma the right lung affected

more than the left one while in adenocarcinoma both lungs affected in equal percent (Table 3). Our findings correlate with Buccheri G. study[23]. The findings of the present study in sample of Iraqi patients, are in agreement with those reported in these studies and underscore the importance of a standardized description of fiber optic bronchoscopy findings as a tool in the diagnosis of lung cancer.[23,24,25].

Conclusion:

There was no relationship between the fiber optic bronchoscope findings and their anatomical locations with the histological types of lung.

Author contributions:

Study conception by prof: Adnan Al,jobouri.
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 Acquisition of data by Dr: Firas Raad
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