Original Article

Bronchogenic carcinoma: multifaced endoscopic encounter

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Abstract

Background: Bronchogenic carcinoma with stray causal relationship with tobacco smoking still has significant impact on healthcare services in developing countries like India. In view of variable and inconsistently proved susceptibility of selected smokers, diverse clinical scenario, multiplicity of histopathological typing, the need of comprehensive and confirmatory diagnostic strategy is a significant medical challenge, especially when resources are limited.

Objective: This study is being undertaken to learn more on the bronchoscopic presentation of bronchogenic carcinoma and the diagnostic utility of different bronchoscopic sampling procedures in relation to different histopathological types.

Material and Methods: In this retrospective study, analysis of endoscopic morphology and type of bronchogenic carcinoma was carried out. A total of 90 diagnosed cases of bronchogenic carcinoma by bronchoscopy were included in the study.

Results: 36.67% of the cases had proximal lesions while 63.33% cases had distal lesions. Wall confined distorting lesions, Intraluminal projectile lesions and extraluminal lesions with external compression were present in 51.1%, 30%and 18.8% of the cases respectively. A positive report of malignancy was obtained by bronchial wash in 69.3% cases, by bronchial brush in 70% cases and by bronchial punch biopsy in 89.18% cases.

Conclusions: Intramural wall distorting lesion is the most common presentation of squamous cell carcinoma while extraluminal compressing lesion is that of adenocarcinoma. Bronchial biopsy and bronchial wash has almost similar diagnostic yield for intraluminal and intramural wall distorting lesions. Bronchial biopsy, wash and brush has very low yield in extraluminal compression.

Keywords: Bronchoscopy, Bronchogenic carcinoma, Endoscopic morphology, Histopathological type

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Introduction

Most of the lung cancer cases are directly related to the effect of long term tobacco smoking, though recent studies relate it to genetic factors and other environmental and occupational exposures. The World Health Organization estimates that lung cancer deaths worldwide will continue to rise, largely as a result of an increase in global tobacco use, especially in Asia.[1] There are two broad categories of lung cancer: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). SCLC accounts for around 15% of lung cancer cases and NSCLC, which accounts for the remaining 85% of cases. NSCLC is further classified mainly into Squamous cell carcinoma, Adenocarcinoma and Large cell carcinoma.[2]

Bronchoscopy is widely use method for evaluating the tracheobronchial tree in patients with suspected lung cancer. In addition to the visualization, bronchoscopy

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also allows the collection of samples through different techniques. The choice of sampling technique is often left to the physician preforming bronchoscopy.

Material and Methods

With the objective to learn more on the bronchoscopic presentation of bronchogenic carcinoma and the diagnostic utility of different bronchoscopic sampling procedures in relation to different histopathological types, we carried out a retrospective analysis of endoscopic morphology and histological type of bronchogenic carcinoma in Department of Pulmonary Medicine, Shri MP Shah Govt. Medical College and Guru Gobind Singh hospital, Jamnagar, Gujarat. A total of 90 diagnosed cases of bronchogenic carcinoma by bronchoscopy were included in the study over a period of 2 years from September 2013 to September 2015.

Results

Bronchoscopic location of the lesion has been shown in Table 1. 36.67% of the cases had proximal lesions involving one of the main bronchi. Rest 63.33% cases were having distal lesions which included 33.33% lobar bronchial involvement and 30% segmental bronchus involvement. Wall confined distorting lesions were present in 46 cases (51.1%). Intraluminal projectile lesions were present in 27 cases (30%). Extraluminal lesions with external compression were found in 17 cases (18.8%). Out of the wall distorting lesions infiltrative lesions were found in 26 (28.8%) cases and ulcerative type in 11 cases (12.2%) and nodular type in 9 cases (10%). Diagnostic yield of different technique has been shown in Table 2. A positive report of malignancy was obtained by bronchial wash in 69.3% cases, by bronchial brush in 70% cases and by bronchial punch biopsy in 89.18% cases.

Table 1. Bronchoscopic location of lesion

Site of lesion	No	%
Carina and Right Main Bronchus	20	22.2%
Right Upper lobe Bronchus	19	21.1%
Right middle lobe Bronchus	11	12.2%
Right lower lobe Bronchus	3	3.3%
Right side multiple Bronchus	8	8.8%
Carina and Left Main Bronchus	13	14.4%
Left Upper Lobe Bronchus	14	15.5%
Left Lingular Lobe Bronchus	4	4.4%
Left Lower Lobe Bronchus	6	6.6%
Left side multiple Bronchus	11	12.2%

Table 2. Diagnostic yield of different bronchoscopic procedures

Sample Type (n)	Positive for malignancy	Negative for malignancy	Inadequate sample
Bronchial Wash (88)	61(69.31%)	15(17.05%)	12 (13.64%)
Bronchial brush (80)	56(70%)	15(18.75%)	9(11.25%)
Bronchial Punch biopsy (74)	66(89.19%)	4(5.41%)	4(5.41%)

Table 3. Relationship between cyto/histopathological cell type and bronchoscopic morphology

	Intraluminal	Wall distorting	Extraluminal compressing	Total
Squamous cell	18	38	4	60
Adenocarcinoma	3	4	8	15
Large cell cancer	2	1	2	5
Small cell cancer	4	3	2	9
Undifferentiated	0	0	1	1
Total	27	46	17	90

Table 4. Relationship of diagnostic yield of procedures with morphology of lesion

	Intraluminal lesion n=27	Intramural distorting lesion n=46	Extraluminal lesion n=17
Bronchial wash (+ve)	24 (88.89%)	41 (89.13%)	0 (0 %)
Bronchial brush (+ve)	23 (85.19%)	36 (78.26%)	1 (5.88%)
Biopsy (+ve)	25 (92.59%)	41 (89.13%)	0 (0 %)

(+ve): positive for malignancy

Sensitivity of bronchial wash, bronchial brush and bronchial punch biopsy was 80.26%, 78.87% and 94.29% respectively. It can be seen from table 3 that most common presentation of squamous cell carcinoma was intramural wall distorting lesion (63.33%) and most common presentation of adenocarcinoma was extraluminal compression (53.33%). The relationship of diagnostic yield of different bronchoscopic procedures with morphology of the lesion has been shown in Table 4. For intraluminal and intramural wall distorting lesions, bronchial wash and biopsy had almost similar diagnostic yield. Diagnostic yield of all three methods was very low in extraluminal compressing lesions.

Discussion

We observed the higher prevalence of distal lesions involving lobar bronchus than the proximal lesions involving main bronchus. This is in accordance with the studies by Liam C K et al[3] in 2007 and by Noronha V et al in[4] 2012. We found higher incidence of intramural wall distorting lesion followed by intraluminal lesion and extraluminal wall compressing lesion which is comparable with the studies by Schenk DA et al[5] and Sahin F et al.[6]

The studies by AB Fuladi et al[7] Liam CK et al[3] and Kjetil Roth et al[8] showed a definite higher diagnostic yield with bronchial biopsy method followed by in order, bronchial brush and bronchial wash. The present study has similar results with highest diagnostic yield with bronchial biopsy followed by bronchial brush and bronchial wash. Squamous cell carcinoma was the predominant cell type in studies by AB Fuladi et al,[7] Bhattacharyya Sujit Kumar et al,[9] Rabahi MF[10] and Navin Pandhi et al[11] which accounted for 42.3%, 35.3%, 39% and 41% of studied cases respectively. The present study showed squamous cell carcinoma as the predominant cell type in 62% of cases. Adenocarcinoma was the predominant cell type in studies by Liam CK et al[3] and Noronha V et al[4] which accounted for 40.9% and 40.15% of studied cases respectively. The present study showed a prevalence of adenocarcinoma in only 19% cases. This difference may be due to geographical variability and difference in the smoking pattern. Small cell carcinoma cell type was present in 11.5%, 12.9%, 13.3%, 12%, 8.3% and 13% cases in studies by AB Fuladi et al,[7] Liam CK et al,[3] Bhattacharyya Sujit Kumar et al,[9] Rabahi MF,[10] Noronha V et al[4] and Navin Pandhi et al[11] respectively. The present study is comparable with these studies which reported 9% cases of small cell carcinoma. Non small cell carcinoma was present in 74.9%, 74%, 52.8%, 61%, 66.5% and 80% cases in studies by AB Fuladi et al,[7] Liam CK et al[3] Bhattacharyya Sujit Kumar et al,[9] Rabahi MF,[10] Noronha V et al[4] and Navin Pandhi et al[11] respectively. The present study is comparable with these studies which reported 89% cases of non small cell carcinoma. In case of endoscopically visible lesions (intraluminal + intramural wall distorting lesion) the study by AB Fuladi et al[4] reported a positive diagnostic yield of 76.92%, 80.76% and 76.92% by bronchial wash, bronchial brushing and bronchial biopsy methods respectively. Study by Liam CK et al[3] reported a positive diagnostic yield

of 28.3%, 53.7% and 77.5% by bronchial wash, bronchial brushing and bronchial biopsy methods respectively. Present study reported a positive diagnostic yield of 88.9%, 81.6% and 90.8% by bronchial wash, bronchial brushing and bronchial biopsy methods respectively. Lesser diagnostic yield by bronchial wash and bronchial brush methods in study by Liam CK et al[3] could be due to variability of morphology and location of lesions. In case of extraluminal compressing lesions, the diagnostic yield by bronchoscopic procedures were low in present study, with 5.8% cases with positivity by bronchial brush method. The study by Kjetil Roth et al[8] also recorded a low diagnostic yield in such cases (10.2%). We observed in our study that the most common presentation of squamous cell carcinoma was intramural wall distorting lesions while that of adenocarcinoma was extraluminal compressing lesion. Similar findings have also observed by other authors.[10,12]

Conclusion

Intramural wall distorting lesion is the most common presentation of squamous cell carcinoma while extraluminal compressing lesion is that of adenocarcinoma. Bronchial biopsy and bronchial wash has almost similar diagnostic yield for intraluminal and intramural wall distorting lesions. Bronchial biopsy, wash and brush has very low yield in extraluminal compression.

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