



Efficacy of Bronchial Brushing Cytology and Its Correlation with Biopsy in Lung Tumours At tertiary care Hospital northern western

Authors

Sharda Dawan¹, Sunita Bika², Manohar Lal Dawan³

^{1,2}Assistant Professor, ^{3,4}Associate Professor

^{1,2}Department of Pathology

³Department of General Surgery

Corresponding Author

Sharda Dawan

Assistant Professor, Department of Pathology, Sardar Patel Medical College, Bikaner, Rajasthan

Mobile no-9929789442, Email: drmanohar_dawan1234@yahoo.com

Abstract

Background: Bronchial brushing (BB) and the more recent trans-bronchial needle aspiration (TBNA) are well established techniques performed using flexible fiberoptic bronchoscope, for sampling trachobronchial lesions suspected of malignancy.

Material & Method: This study was carried out in department of pathology, Sardar Patel Medical College & Associated Group of Hospitals, Bikaner. This study included 50 cases of clinically suspected lung cancer either primary or metastatic.

Results: The accuracy of Bronchial Brush Cytology in the diagnosis of Squamous Cell Carcinoma was 81.57%; in Bronchogenic Adenocarcinoma accuracy was 80%, in Small Cell Anaplastic Carcinoma 83.33% and in Large Cell Carcinoma it was 100%.

Conclusion: Bronchial brushing is a better technique than Post FOB in diagnosing lung cancer. If both techniques are used simultaneously, the efficacy of this combination in diagnosis of lung cancer proves much superior to either techniques used alone, probably by addition of their advantageous features, and reducing the chances of their failure, thereby helping in early diagnosis of lung cancer.

Keywords: Bronchogenic carcinoma, bronchial brushing, cytology, histopathology.

Introduction

The introduction of flexible fiberoptic bronchofibroscope around 1970 revolutionized the cytology of respiratory tract¹. Various bronchopulmonary lesions, otherwise unreachable with rigidbody bronchoscope, became more easily accessible with this instrument. Techniques like bronchial brushings (BB), broncho-alveolar lavage and transbronchial needle aspiration

(TBNA) became popular tools for obtaining diagnostic cytological material from various sites of the tracheo-bronchial passage. Today these cytological procedures constitute the most useful and least expensive investigative tools available for the detection of pulmonary diseases, especially lung cancer².

Respiratory tract, continuously exposed to a wide variety of environmental factors, be it the various

airborne micro-organisms, natural allergens, or the wide variety of pollutants, in particular the products of combustion, like those in tobacco smoke and automobile exhaust fumes, suffers from a wide variety of infective, inflammatory and immunologic primary respiratory diseases, in addition to a variable degree of secondary involvement of respiratory system in virtually all terminally ill patients.³

Material and Methods

This study was carried out in department of pathology, Sardar Patel Medical College & Associated Group of Hospitals, Bikaner. This study included 50 cases of clinically suspected lung cancer either primary or metastatic.

The samples were obtained by fiber-optic bronchoscopy by the chest physician at department of Chest & Tuberculosis, S.P. Medical College and P.B.M. hospital, Bikaner. Bronchial brushings were received as air-dried and wet-fixed smears of two to three brushings by disposable bronchial brush, smeared directly on to the clean glass slides. The bronchial brushing tends to preserve both the cells and their architectural arrangement. The air dried smears were stained with Giemsa and the wet fixed slides with Haematoxylin & Eosin stains.

Results

Table: I. Accuracy of Bronchial Brush Cytology in Comparison with Histo-pathological diagnosis.

S.N.	Diagnosis	HPR (n)	B.B. (n)	% Accuracy
1.	Sq. Cell Ca.	38	31	82
2.	Bronchogenic Adenocarcinoma	05	04	80
3.	Small Cell Anaplastic Ca.	06	05	83
4.	Large Cell Ca.	01	01	100

The table: I showing diagnostic accuracy of Bronchial Brush Cytology in comparison with Histo-pathology. The accuracy of Bronchial Brush Cytology in the diagnosis of Squamous Cell Carcinoma was 81.57%; in Bronchogenic Adenocarcinoma accuracy was 80%, in Small Cell

Anaplastic Carcinoma 83.33% and in Large Cell Carcinoma it was 100%.

Table: II. Accuracy of Post Fiber-Optic Bronchoscopy (Post FOB) Sputum Cytology in Comparison to Histo-Pathological Diagnosis.

S.N.	Diagnosis	HPR (n)	Post FOB Sputum (n)	% Accuracy
1.	Sq. Cell Ca.	38	4	11
2.	Bronchogenic Adenocarcinoma	05	01	20
3.	Small Cell Anaplastic Ca.	06	03	50
4.	Large Cell Ca.	01	Nil	Nil

The table: II showing diagnostic accuracy of Post Fiber-Optic Bronchoscopy (Post FOB) Sputum Cytology in comparison with Histo-pathology. The accuracy of Post Fiber-Optic Bronchoscopy (Post FOB) Sputum Cytology in the diagnosis of Squamous Cell Carcinoma was 10.53%; in Bronchogenic Adenocarcinoma accuracy was 20%, in Small Cell Anaplastic Carcinoma 50% and Large Cell Carcinoma was not reported in sputum cytology.

Table: III. The comparison of accuracy of different cytological methods in the diagnosis of different lung malignancies confirmed by Histo-pathology Examination

S.N.	Diagnosis	Accuracy (%) of Cytology	
		By H.P.E. n (%)	B.B. (%) Post F.O.B. Sputum (%)
1.	S.C.Ca. 38 (76)	82	11
2.	Bronchogenic Adenoca. 05 (10)	80	20
3.	S.C.A.C. 06 (12)	83	50
4.	L.C.Ca. 01 (02)	100	Nil

The table: III showing accuracies of different cytological methods of diagnosis applied in our study of 50 cases of suspected lung malignancy undergone fiber-optic bronchoscopy. In this study we compare accuracy of three types of cytological methods (Bronchial Wash, Bronchial Brushing and Post Fiber-optic Bronchoscopy Sputum) with Histo-pathological examination of biopsy.

The present study showing that in the diagnosis of squamous cell carcinoma accuracy of Bronchial Brushing 82% and Post Fiber-Optic Bronchoscopy Sputum is 11% in comparison to Histo-pathological study. In the diagnosis of Bronchogenic Adenocarcinoma the accuracy of Bronchial Brushing 80% and Post Fiber-Optic Bronchoscopy Sputum is 20% in comparison to Histo-pathological study. In the diagnosis of Small Cell Anaplastic Carcinoma the accuracy of Bronchial Brushing 83% and Post Fiber-Optic Bronchoscopy Sputum is 50% in comparison to Histo-pathological study. In the diagnosis of Large Cell Adenocarcinoma the accuracy of Bronchial Brushing 100% and Post Fiber-Optic Bronchoscopy Sputum is negative, in comparison to Histo-pathological study.

Discussion

According to the results of this study showing that bronchial brushings are more helpful in making diagnosis of lung malignancy than post bronchoscopy sputum.

Except for two cases almost all cases which had positive finding in bronchial brushing were also positive in bronchial wash as well as post bronchoscopy sputum.

In one case of biopsy positive small cell anaplastic carcinoma (SCAC) post bronchoscopy sputum was the only positive cytology; bronchial wash and bronchial brushing were inconclusive or negative.

Similarly in one case of biopsy positive bronchogenic adenocarcinoma, bronchial wash was the only positive cytology; bronchial brushing and post bronchoscopy sputum were inconclusive or negative.

M Kawaraya *et.al.* Studied in 2003 evaluated the effectiveness of various cytological examinations. Flexible fiber-optic bronchoscopy was performed in 1372 patients with lung cancer. Histological examination of specimens obtained by forceps biopsy and cytological examinations on imprints of biopsy specimens, brushing, selective bronchial lavage, curettage, transbronchial needle aspiration,

rinse fluids of the forceps, brush, curette, and aspiration needle, and all fluids aspirated during the bronchoscopic examinations were evaluated for diagnostic power. Using these techniques, the overall diagnostic rate with bronchoscopy was 93.4%. The addition of both imprint cytology and cytology on the rinse fluid of the forceps increased the diagnostic rate to 86.2% (Po0.0001). Their results indicate that cytological examinations of the imprints of biopsy samples and the rinse fluids of the forceps and the brush improve the efficacy of fiberoptic bronchoscopy in the diagnosis of Peripheral lung cancer ⁴.

Gaur DS *et.al.* Studied 196 cases of suspected lung cancer, where flexible bronchoscopic samples of broncho-alveolar lavage (BAL) and bronchial brush (BB) cytology as well as bronchial biopsy were taken and processed as per standard procedures of cytology in diagnosing lung cancer, taking bronchial biopsy as the 'Gold Standard' diagnostic test. Sensitivity of BB 87.3%; while that of BAL was 39.4%. Specificity of BB and BAL was 97.6% and 89.6%, respectively. BB was better than BAL in morphological typing of lung cancers. They conclude that bronchial brushing is a much superior technique in the diagnosis and morphological typing of lung cancers ⁵.

Conclusion

Bronchial brushing is a better technique than post FOB in diagnosing lung cancer. If both techniques are used simultaneously, the efficacy of this combination in diagnosis of lung cancer proves much superior to either techniques used alone, probably by addition of their advantageous features, and reducing the chances of their failure, thereby helping in early diagnosis of lung cancer.

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