

BRONCHIAL BRUSHING AND BRONCHIAL BIOPSY: COMPARISON OF DIAGNOSTIC ACCURACYSatish Motiwale¹, Shilpi Dosi², Ravi Dosi³**HOW TO CITE THIS ARTICLE:**

Satish Motiwale, Shilpi Dosi, Ravi Dosi. "Bronchial Brushing and Bronchial Biopsy: Comparison of Diagnostic Accuracy". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 22, June 02; Page: 6229-6232, DOI: 10.14260/jemds/2014/2727

ABSTRACT: Bronchoscopy is an integral part of the diagnostic armamentarium of a clinician in diagnosing and typing lung malignancy. The ability of sampling and visualizing lung lesions with a bronchoscope in a single procedure with the use of bronchial washing, brushing & biopsy. Our study performed in a tertiary care setting medical college revealed a higher yield with both procedures done simultaneously rather than individually. Individually biopsies give a higher yield as compared to brushings.

KEYWORDS: Bronchoscopy.

INTRODUCTION: The most common indication for bronchoscopy in malignancy is diagnostic. Usually the patient is someone with features suggesting a malignant etiology. It's usually used for obtaining pathological material for histology or cytology. Bronchoscopic procedure is the simplest method for tissue procurement with little morbidity and almost negligible mortality.¹

MATERIAL & METHODS: In SAIMS, Indore we investigated cases with possible lung malignancy by brushing and biopsy the visualized lesions while doing fibreoptic bronchoscope after taking informed consent from the patients and clearance for the study from Institutional Ethics committee.

The study was performed over a period of 6 months from Nov 2013 to April 2014. Total of 120 cases underwent bronchoscopy of which 43 cases were diagnosed as being suggestive of malignancy.

Specimens were taken during fibreoptic bronchoscopy under local anesthesia.

The bronchial brushings smear were fixed with 95% alcohol immediately and sent to the cytologist for examination under PAP smear. Multiple bites of tissue specimen were taken for histological examination from the same area by forceps, and stained with H&E stain. We compared the brushings and biopsy findings in 43 cases out of the total 120 cases.

RESULTS:

Comparison of Diagnostic Accuracy of Bronchial Brushing and Bronchial Biopsy: The diagnoses made by brushing and biopsy of the 43 patients, suggests that 34(90.3%) were classified as showing positive results by brushing, and 23(64.8%) by biopsy.

A combination of the two techniques yielded the highest percentage of positive diagnoses (93.7%). The final histological diagnosis of 40 patients represents that the number of cases in which brushing and biopsy material yielded the correct diagnosis of cell type.

Overall, a positive diagnosis was made in 37 cases by both techniques. A comparison of the cell types diagnosed; there was agreement between the diagnoses in 22 cases (55.5%).

ORIGINAL ARTICLE

A final histological diagnosis was obtained in 23 of the cases classified as positive by bronchial brushing. A final histological diagnosis was made in 37 of the patients in whom the bronchial biopsy material had been classified as positive.

A correct diagnosis was made on the brushing and biopsy specimens in over 90% of cases of squamous or small cell carcinoma. By contrast, the diagnostic accuracy in large cell carcinoma and in adenocarcinoma was 20% and 50% respectively.

DISCUSSION: Several studies have investigated the accuracy of brushing and biopsy. Payne et al²⁻⁶ compared the diagnoses of cell type made from bronchial aspirate and bronchial biopsy specimen with the diagnoses based on surgical or necropsy specimen, but not all patients had both examinations. Lyall et al³⁻⁷ also compared similar cell types. Three groups of workers have reported that bronchial brushing and biopsy have similar diagnostic accuracy, 2-4 whereas others have found that bronchial brushing is more likely than biopsy to give a positive result.⁷

This study also confirms previous reports suggesting that the yield of malignant cells is higher in squamous and small cell carcinoma than in other types of tumour.⁵ According to Lyall et al,⁶ where both techniques gave a positive result, the cell type was reported as the same in 80.4% of cases, a figure that is similar to ours.

Correct histological typing of lung cancer is important in clinical management and it is generally accepted that the cell type diagnosed from bronchial biopsy material will be an accurate reflection of the main tumor. In this investigation, however, the bronchial biopsy diagnosis agreed with the final diagnosis in 81.5% of cases overall; the corresponding figures for squamous and small cell carcinomas were 96.2% and 94.4%, but only 50% for adenocarcinoma and 20% for large cell carcinoma. Payne et al⁴ found that in only 45% of squamous carcinomas diagnosed from biopsy specimens was the cell type confirmed by final histological diagnosis, although all of their small cell carcinomas were correctly categorized.

Their figures for the correct diagnosis of adenocarcinoma and large cell carcinoma were 82% and 38% respectively. Hinson's group⁷ also investigated the accuracy of bronchial biopsy and found that 95% of their squamous carcinomas, 83% of small cell carcinomas, and 75% of adenocarcinomas but none of the large cell carcinomas had been correctly diagnosed.

Fibreoptic biopsy specimens are small and generally taken from one area. Furthermore, the degree of differentiation of the tumor may vary from place to place, and if no glandular component is found in a small biopsy specimen of an adenocarcinoma it may be reported as poorly differentiated squamous or large cell carcinoma. An accurate diagnosis of large cell carcinoma cannot be made from a small biopsy specimen, and necrotizing tumors are often misdiagnosed as small cell carcinoma.

Although Hinson et al⁸ stated that bronchial biopsy gives an accurate indication of the type of primary tumor, Chuang et al⁹ affirmed that if clear cut morphological criteria cannot be satisfied, a diagnosis of "lung cancer, non-small cell type" should be made. Shure et al¹⁰ suggested performing three biopsies of the endobronchial lesion to achieve an optimal diagnostic yield, but to our knowledge no correlation between number of biopsy specimens and cell typing accuracy has been reported.

In brush specimens there was good agreement with the final diagnosis in small cell and squamous carcinoma, but large cell carcinomas and adenocarcinomas were often misdiagnosed.

ORIGINAL ARTICLE

Other workers have also encountered difficulties in the diagnosis of these last two variants of lung cancer.⁶⁻¹⁰

Metaplastic squamous cells in adenocarcinoma may be wrongly interpreted as squamous carcinoma, and conversely in squamous carcinoma the cells may be clustered and have large nucleoli, suggesting adenocarcinoma. The loosely coherent, pleomorphic cells of large cell carcinoma may also be mistaken for those of a squamous carcinoma, and sometimes the cells shed by polygonal small cell carcinomas give rise to similar problems.¹²

We conclude that brushing and forceps biopsy have a similar cell typing accuracy, and the results of both must be taken into consideration in the diagnosis of malignancies

The yield of bronchial brushing is better than biopsy; and both techniques together gives better chances of positive diagnoses.

REFERENCES:

1. Postmus et al. Bronchoscopy for lung cancer. *Chest*. 2005; 128 (1):16-18.
doi:10.1378/chest.128.1.16
2. Skitarelic K, von Haam E. Bronchial brushings and washings: a diagnostically rewarding procedure? *Acta Cytol* 1974; 18 : 321-6.
3. Zavala DC. Diagnostic fiberoptic bronchoscopy. Techniques and results of biopsy in 600 patients. *Chest* 1975; 68:12-9.
4. Kvale PA, Bode FR, Kini S. Diagnostic accuracy in lung cancer. Comparison of techniques used in association with flexible fiberoptic bronchoscopy. *Chest* 1976;69: 752-7.
5. Chopra SK, Genovesi MG, Simmons DH, Gothe B. Fiberoptic bronchoscopy in the diagnosis of lung cancer. Comparison of pre- and post-bronchoscopy, sputum, washings, brushings and biopsies. *Acta Cytol* 1977; 21:524-7.
6. Payne CR, Hadfield JW, Stovin PG, Barker V, Heard BE, Stark JE. Diagnostic accuracy of cytology and biopsy in primary bronchial carcinoma. *J Clin Pathol* 1981; 34: 773-8.
7. Lyall JRW, Summers GD, O'Brien IM, Bateman NT, Pike CP, Braimbridge MV. Sequential brush biopsy and conventional biopsy: direct comparison of diagnostic sensitivity in lung Malignancy. *Thorax* 1980; 35:929-31.
8. Hinson KFW, Miller AB, Tall R. An assessment of the World Health Organization classification of the histologic typing of lung tumors applied to biopsy and resected material. *Cancer* 1975; 35: 399-405.
9. Chuang MT, Marchevsky A, Teirstein AS, Kirschner PA, Kleinerman J. Diagnosis of lung cancer by fibreoptic bronchoscopy: problems in the histological classification of non-small cell carcinoma. *Thorax* 1984; 39:175-8.
10. Shure D, Astarita RW. Bronchogenic carcinoma presenting as an endobronchial mass. Optimal number of biopsy specimens for diagnosis. *Chest* 1983; 83:865-7.
11. Atay Z, Brandt H-J. Ergebnisse zytologischer Untersuchungen des Bronchialsekrets bei Lungentumoren im Verhältnis zum Tumorstadium (TNM-system). *Dtsch Med Wochenschr* 1975; 100:1269-74.
12. Kanhouwa SB, Matthews MJ. Reliability of cytologic typing of lung cancer. *Acta Cytol* 1976; 20:229-32.

ORIGINAL ARTICLE

13. Suprun H, Pedio G, Ruttner JR. The diagnostic reliability of cytologic typing in primary lung cancer with a review of the literature. Acta Cytol 1980;24: 494-500. Article Received: 30/4/2014.

AUTHORS:

1. Satish Motiwale
2. Shilpi Dosi
3. Ravi Dosi

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Respiratory Diseases, Sri Aurobindo Institute of Medical Sciences & Post Graduate Institute, Indore.
2. Assistant Professor, Department of Pathology, Sri Aurobindo Institute of Medical Sciences & Post Graduate Institute, Indore.
3. Assistant Professor, Department of Respiratory Diseases, Sri Aurobindo Institute of Medical Sciences & Post Graduate Institute, Indore.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Ravi Dosi,
Department of Respiratory Diseases,
SAMC & PGI, Indore.
Email: ravi.dosi@gmail.com

Date of Submission: 30/04/2014.
Date of Peer Review: 01/05/2014.
Date of Acceptance: 20/05/2014.
Date of Publishing: 02/06/2014.