

Original Article

Role of bronchial washing in the pathological diagnosis of bronchoscopically visible lung mass

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Abstract

Background: There is still disagreement as to the value and reliability of bronchial wash in comparison with histology, for the diagnosis of malignancy by flexible bronchoscopy.

Objective: To evaluate the usefulness of bronchial washings in addition to endobronchial biopsies for the pathological diagnosis of bronchoscopically visible lung mass (tumour).

Material and Methods: In this study, patients were included if they had 1) bronchoscopically visible mass (outgrown, necrotic, infiltrative, nodular, ulcerative) and 2) bronchial washings (BW) performed along with endobronchial biopsies (EBB).

Results: Forty five patients were included in the present study. Endobronchial biopsy and bronchial wash cytology both were positive for malignancy in 38 (84.45%) patients. Exclusive endobronchial biopsy was positive for malignancy in 6 (13.33%) patients while exclusive bronchial wash cytology was positive for malignancy in only 1 (2.22%) patient.

Conclusions: The addition of BW to EBB is beneficial, but it may not be cost-effective. This procedure may be useful in patients with a bronchoscopically visible outgrown tumour with necrosis. Processing of bronchial washing specimen only when the histocytologic results of EBB is negative; is the best diagnostic approach because combining BW with EBB improves the diagnostic yield only marginally.

Keywords: bronchial wash, cytology, bronchoscopically visible mass, endobronchial biopsy

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Introduction

Lung cancer is one of the most frequent malignancies in the industrialized nations. It is the commonest cause of death from cancer in males. According to recent studies the incidence is on the rise in women.¹ With increasing prevalence of smoking, lung cancer has reached epidemic proportions in India. It is the commonest malignancy in males. Majority of the patients present with locally advanced or disseminated disease.²

Lung cancers can be divided into central lesions that are endoscopically visible

and peripheral lesions that are endoscopically non-visible.³ Endoscopically visible central lesion is the most common presentation of lung cancer in India.² The role of bronchoscopy in making a diagnosis of endoscopically visible lung cancer is well established. The diagnostic yield of bronchoscopic procedures for a centrally located tumor by using biopsies is highest followed by bronchial brushings. However, the role of bronchial washings is still controversial.⁴ Many authors⁵⁻⁷ supports the use of bronchial washing in addition to

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endobronchial biopsies and bronchial brushing whereas others⁸⁻¹⁰ does not found any benefit of bronchial wash. Therefore, the authors performed this study to see whether bronchial washing has any benefit in diagnosis of endoscopically visible lung cancer in addition to endobronchial biopsies.

Material and Methods

The present study was carried out on outdoor and indoor patients attending the Department of Pulmonary Medicine Shree M.P. Shah Medical College and G.G. Hospital, Jamnagar, Gujarat. The patients who fulfilled the following criteria were included in the study.

1. Bronchoscopically visible lung mass
2. Bronchial wash cytology and biopsy specimens taken simultaneously
3. Diagnosis of malignancy made by either biopsies specimen or wash cytology

Patients with extraluminal compression and those with inadequate materials in biopsy samples were excluded from the study. Bronchial biopsy was taken multiple times till sufficient material was obtained, which was then preserved in 40% formalin and then sent for histopathological examination. Bronchial wash was collected by instilling 20 to 40 ml normal saline and aspirated back into trap which was immediately sent for processing and staining.

A detail history, thorough examination, bronchoscopic appearance and histocytology were recorded. Histocytology of tumor was classified as squamous cell carcinoma, small cell carcinoma, adenocarcinoma, large cell carcinoma and unclassified. Bronchoscopic appearance was classified as outgrown tumor without necrosis, outgrown tumor with necrosis, infiltrative, ulcerative or nodular.

Results

Total 45 patients were included in the present study. 8 patients presented with outgrown tumour without necrosis, 8 patients presented with outgrown tumour with necrosis, 18 patients presented with infiltrative lesion, 5 patients presented with nodular lesion and 6 patients presented with ulcerative lesion. Endobronchial biopsy was positive for malignancy in 44 (97.78%) patients and bronchial wash cytology was positive for malignancy in 39 (86.67%) patients. Endobronchial biopsy and bronchial wash cytology both were positive for malignancy in 38 (84.45%) patients. Exclusive endobronchial biopsy was positive for malignancy in 6 (13.33%) patients while exclusive bronchial wash cytology was positive for malignancy in only 1 (2.22%) patient. So, bronchial wash cytology was the diagnostic procedure in 1 (2.22%) of the patients which was having outgrown tumour with necrosis.

Endobronchial biopsy was positive in all type of patients except one patient with outgrown tumour with necrosis. The results of bronchial wash in patients with different bronchoscopic findings are summarized in table 1. It can be seen that bronchial wash is useful in patients having outgrown mass and ulcerative lesions.

Table 1. The results of bronchial wash in association with various bronchoscopic findings

Bronchoscopic findings	Bronchial wash +ve	Bronchial wash -ve	Total
Outgrown mass without necrosis	7	1	8
Outgrown mass with necrosis	8	0	8
Nodular	4	2	5
Infiltrative	15	3	18
Ulcerative	5	0	6
Total	39	6	45

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Discussion

Lung tumours are the most common cause of death due to cancer in men and are now emerging as important cause of neoplasm mortality in females.¹ Pulmonary wash cytology and histopathology are valuable tools in the diagnosis of lung malignancies. The first realization that lung cancer could be accurately diagnosed and typed by the microscopic study of expectorated cells is generally attributed to Dudgeon and Barret.¹¹ With the advent of flexible fiber-optic bronchoscope, respiratory cytology took a new turn as samples like bronchial washings, bronchial brushings, broncho-alveolar lavage and trans-bronchial needle aspirations could be collected from the respiratory tract, yielding significant amount of cytological material.¹² Since cytological sampling by bronchial wash technique relies mainly on cells 'exfoliated' from the malignant lesion in the bronchial epithelium, the adequacy of its samples depends on several vital factors, especially the degree of differentiation of malignant growth. In general, less differentiated anaplastic lesions have more loosely cohesive cells in comparison to well differentiated lesions. Thus such lesions exfoliate larger number of cells into the bronchial cavity than the well differentiated lesions.¹³

There is no clear agreement on the addition of bronchial wash to endobronchial biopsy for the diagnosis of centrally located lung cancer. The sensitivity of bronchial aspirates in diagnosing lung cancers varies at various centres. Many studies⁸⁻¹⁰ showed that bronchial wash did not increase diagnostic yield for endoscopically visible lung cancer when compared with endobronchial biopsy and bronchial brush while others⁵⁻⁷ supports the use of bronchial wash. Govert⁵ et al found that addition of bronchial wash to endobronchial biopsy increased sensitivity for

the diagnosis of lung cancer from 80.8% to 84.8%. Chaudhary⁷ et al found that bronchial wash alone had the highest diagnostic yield of 77.9% which could be increased to 95.8% when combined with endobronchial biopsy. They were able to make additional diagnosis of lung cancer from bronchial wash in 2.7% of the patients. They concluded that bronchial wash should be done after biopsy to increase the malignant cells within the washing specimen. Although bronchial wash in the present study wash positive in 86.67%, an additional one patient of lung cancer was diagnosed by this procedure which might be useful in terms of clinical diagnosis. However, in terms of cost-effectiveness, the benefit of this procedure has to be reconsidered. This study has shown that bronchial wash cytology is a reasonably sensitive diagnostic tool for lung tumors. Hence it can be relied upon as an alternative to biopsy where the latter is contraindicated or is not possible.

Conclusion

Bronchial washing is useful additional diagnostic tool to endobronchial biopsy for pathological diagnosis of bronchoscopically visible lung cancer particularly outgrown tumour with necrosis but it may not be cost-effective. Therefore, processing of bronchial wash specimen should be done only when the result of biopsy is negative as combining bronchial wash with biopsy improves the diagnostic yield only marginally.

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