BRONCHIAL WASH IN THE DIAGNOSIS OF LUNG LESIONS

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Abstract

Objective: To correlate bronchial wash cytology with histology and bronchoscopic findings.

Methods: A total of 495 bronchial washing were reviewed and correlated with their bronchoscopic findings and histology.

Results: A clinical suspicion of lung tumor, hemoptysis, and pulmonary infiltration in chest X-ray were the most common indications for bronchial wash. Malignancy was found in 62.5% and positive Z.N. stain in 1.8% of wash cytology. The sensitivity of bronchial washing in malignant cell detection was 82%, increased to 95% when combined with brush and the overall accuracy of the procedure was 86%.

Conclusions: This study shows that bronchial wash is a useful procedure in diagnosing many chest diseases and that it has a high sensitivity and accuracy rate.

Key Words: Bronchoscopy, Wash, and Brush.

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Introduction

Bronchoscopy and bronchial wash were introduced by Ikeda in 1964. Since then bronchoscopy has become an important diagnostic and therapeutic tool for management of chest diseases[1,2]. Common indications of bronchoscopy and wash are chronic cough, hemoptysis, pulmonary infiltration, pleural effusion, unresolved pneumonia, tuberculosis, lung collapse and pulmonary mass[2-6]. In areas with high prevalence of pulmonary tuberculosis, bronchoscopy, bronchial wash and transbronchial lung biopsy are useful procedures in the diagnosis of pulmonary tuberculosis[2,5-7].

Several studies have shown that bronchoscopy and bronchial wash are safe procedures that carry very low mortality rate that range from 0% to 0.1%[2,7-10].

Materials & Methods

Four hundred and ninety five (495) Bronchial washings that were performed in the last two years (from March 2000 to March 2002), were reviewed in the Department of Pathology, College of Medicine, Al-Nahrin university, and the following data were analyzed; Age sex, indications, type of procedure carried out (wash, brush and biopsies) and bronchoscopic findings.

Bronchial wash: After centrifugation of bronchial washing each sample was smeared on 4 albuminized slides, 3 were placed immediately in 95% ethylalcohol for a minimum of 20 minutes and stained with H&E and the fourth air dried smear was stained with Z.N. Stain for Acid Fast Bacilli (AFB).

Bronchial brush: Smears of 73 bronchial brush were prepared after pouring each specimen in a petri dish, examining it against a blackboard, selecting any bloody, discolored, or solid particles, smeared on albuminized slides with a clean slide crushing the particles using a gentle pressure then placed immediately in 95% ethylalcohol for a minimum 20 minutes and stained with H&E.

In 86 cases the results of bronchial wash and brush were compared with histological lung biopsy (the latter was bronchoscopy biopsy, percutaneous needle biopsy or thoracotomy biopsy).

Statistical analysis: Chi square test was used as appropriate level of significance set to be <0.05 through analysis.

Results

A total of 495 bronchial washings were studied, male patients comprised 77.3% and the peak age was 61-70 years (32.3%).

The vast priorities (99%) of bronchial washings were carried out for diagnostic purposes. The most important indications for bronchoscopy in this study were pulmonary infiltration demonstrated in the chest X-ray, lung mass, hemoptysis and interstitial fibrosis in that order which constitute 93% of the total. Bronchial

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washings and brushing were carried out in 14.7% (73 patients). Biopsies were carried out in 86 patients (17.3%).

Cytology revealed malignancy in 297 cases (60%), (85.4% of them were male and only 14.6% were female), non-small cell lung carcinoma was found in 83.5% (248 patients), small cell lung carcinoma in 16.49% (49 patients).

Cytology of lung cancer was positive in 88% of cases with a bronchoscopy finding of fungating tumor mass, in 72% of stenosed bronchus, 28.6% unhealthy mucosa and in 8% of normal mucosa (Table-1).

Table 1: Correlation between Bronchoscopic Findings and Percent of Malignancy in Bronchial Wash

Bronchoscopic findings	Percent of positive malignancy in bronchial wash smears.
Fungating tumor like mass	88%
Narrow segment	72%
Unhealthy mucosa	28.6%
Normal Findings	8%

Table 2 shows the sensitivity and accuracy of bronchial wash cytology to be (82% and 86% respectively), Washing smears predict malignancy in 51 cases out of 62 cases proved malignant by biopsy. 11 cases were false negative (six of the cases proved to be squamous cell carcinoma by histology, four were small cell lung carcinoma and one was adenocarcinoma) and one case was false positive (proved to be pulmonary tuberculosis by histology.). The combination of wash and brush cytology raised the sensitivity rate to 95%. Tubercle bacilli were positive in 9 cases (1.8%). of bronchial wash using Z.N. stain.

Table2: Sensetivity and Accuracy of Bronchial Wash and Brush According to Lung Biopsies

	True +	True -	False +	False -	Total	Sensitivity	Accuracy
Bronch. wash	51	32	1	11	86	82%	86%
Wash & brush	70	0	0	3	73	95.8%	95.8%

Discussion

In Iraq bronchogenic carcinoma should be considered as a high priority problem with the need for expanded facilities for early detection, diagnosis and control and this should underline the provision of screening program that include radiographic, cytologic, and histologic methods to detect early stages of lung cancer and this is the most important step for reducing the disease mortality[1,2,5-8]. Data from Cancer Registry Center (1996) showed that lung cancer is the commonest tumor among male population[11].

The safety of bronchoscopy and the sensitivity of wash have been documented from different parts of the world[5-7]. In this study bronchial wash gave fairly good accuracy (86%) and the sensitivity was (82%). Brush increased the sensitivity of cytology to 95% when done with the wash. These figures are comparable to those reported in other studies (sensitivity ranged from 65% to 94%)[1,4,9-14]. Furthermore of the 9 patients, who were diagnosed as tuberculosis from wash smears stained by Z.N. stain, all had been proved by biopsy. Two cases proved to have both malignancy (squamous cell carcinoma) and tuberculosis, which is not remote possibility to have both pathologies together[5-7].

In conclusion bronchial wash and brush are useful procedures in diagnosing many lung diseases and it has a high sensitivity and accuracy rate.

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