



Study of Bronchial Washings and Brush Cytology in Corelation with Endobronchial Biopsies in Various Lung Diseases

KEYWORDS

Bronchial wash, BB- Bronchial brush. EBB- Endo bronchial biopsy

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ABSTRACT A comparative study was carried out on 75 patients with endobronchial mass lesions from January 2013 to July 2015 at ASRAM medical college and hospital Department of pathology, Eluru. In our study Endobronchial mass lesions were subjected washings, brushings and biopsy for identifying the diagnostic utility of the three procedures in detecting malignant diseases. Of the 75 patients males were 60 and females were 15 in number. Bronchial washings showed only 19% positivity and negativity 57% and the remaining are inadequate. Bronchial washings could detect only 2(4.8%) malignant cells. Bronchial brushings showed 54% positivity and negativity 38% and the remaining are inadequate. Bronchial brushings could detect 22(29%) malignant cells. Bronchial biopsy showed positivity of 80% and negativity 2.6% and the remaining are inadequate. Bronchial biopsy could detect 30 malignant cells.

The diagnostic yield for malignancy in BW was 14%, BB was 41% and EBB was 60%. There was significant difference in the diagnostic yield in BW and EBB.

INTRODUCTION:

Lung cancers were one of the leading causes of cancer deaths worldwide. It accounts for 13 per cent of all new cancer cases and 19 per cent of cancer related deaths worldwide. In India, lung cancer constitutes 6.9 per cent of all new cancer cases and 9.3 per cent of all cancer related deaths in both sexes¹, it is the commonest cancer and cause of cancer related mortality in men. Increased usage of tobacco products have increased the incidence and prevalence of lung disease mainly COPD and cancers. The relative risk of developing lung cancer was 2.64 for bidi smokers and 2.23 for cigarette smokers with 2.45² Early diagnosis helps in planning of accurate treatment modalities which helps in decreasing the morbidity and prolonging mortality. Various methods were employed for diagnosing include chest x-ray, CT-scan, bronchial wash, brush and biopsy. FOB is considered the preferred method for evaluating the tracheobronchial tree in suspected lung disease³. Tissue diagnosis gives a clear distinction between respiratory disease and cancer before planning for aggressive therapy. Histopathological examination remains the gold standard for diagnosing lung cancer.

MATERIALS AND METHODS:

STUDY PLACE: ASRAM Medical College and Hospital, Department of Pathology.

STUDY DURATION: Study was done from January 2013 to July 2015

STUDY POPULATION: The study was carried out on 75 patients with Endobronchial mass lesion.

STUDY DESIGN: Comparative study.

INCLUSION CRITERIA:

Cases with bronchoscopic findings such as mass, a patch or a mucosal surface alterations.

Suspected malignancy cases screened for primary in the lung were included.

Suspected cases of pulmonary tuberculosis were also included under the study.

EXCLUSION CRITERIA:

1. Cases with chronic obstructive lung diseases are contraindicated for bronchoscopy and thus are excluded by default in this study.

2. Paediatric age group is excluded in the study.**METHODS:**

The instrument used was fibre optic bronchoscope, Pentax FB15P. Accessories used were forceps for biopsy, bronchial brush for taking brushings. A detailed history and clinical evaluation was done. Investigations included complete blood examination, random blood sugar, blood urea, serum creatinine, screening for HIV and HbsAg, ECG, X-Ray chest. Patients were taken up for the procedure after overnight fasting. Informed consent for the procedure was taken.

Oxygen saturation was monitored during the procedure with pulse oximetry. Lignocaine 2% solution was instilled through the suction channel to anaesthetise the vocal cords. The bronchoscope was introduced either trans-nasally or orally

Samples were obtained only after complete visualization of both sides⁴

Bronchial washings are obtained by introducing a bronchoscope in the lower respiratory tract and specimens obtained by means of suction apparatus after infusing not more than 5- 10 ml saline and re aspirating the resulting material.

Bronchial brushings

The sample is obtained during bronchoscopy after complete

visualization of tracheobronchial tree. A 1.3 mm nylon brush mounted on a steel guide wire is introduced through the inner channel of the bronchoscope to brush the areas which are considered abnormal under bronchoscopy

Materials obtained by bronchial washings and brushings can be fixed with various fixatives. The sample from bronchial washings is centrifuged and sediment was smeared. Samples from brushings were smeared on clean glass slide. The smears are prefixed with 95% methanol or air dried. Methanol fixed samples are stained using H&E and papanicolaou stain. The air dried samples are stained with leishman stain and MGG. (Bibbo 1997)⁵

Results:

Bronchial washings:

In the Present study of 75 bronchial washings studied 18 were inadequate Out of the 15 inadequate, 4 are inadequate in Bronchial brushings, 5 of them are malignant in Bronchial brushings and 9 of them are inflammatory in Bronchial brushings

The Bronchial washings could detect only two malignant cases in this study and 12 inflammatory lesions. Out of the 43 negative Bronchial washings 5 were inadequate. 18 were malignant in Bronchial brushings, 20 were non malignant in Bronchial brushings. Bronchial washings showed positivity of 4.8%

Bronchial Brushings:

In the Present study of 75 cases, 6 samples were inadequate. Out of 6 inadequate Bronchial brushings 3 were normal in Bronchial washings, 1 is malignant in Biopsy and 2 were non malignant in Bronchial washings. Bronchial brushings showed 41 of them positive including 22 were malignant, 19 were non-malignant, the positivity being 53.6%. The positivity was calculated excluding the inadequate bronchial brushings. out of 28 negative 6 were negative in bronchial washings 20 were non-malignant and 2 were positive in biopsy

The results were proved to have significant difference with respect to Bronchial washings and Bronchial brushings cytology with p value < 0.001, which implies that the difference is due to significant difference in the two methods.

Bronchial biopsy:

Out of the 75 cases Bronchial biopsy showed 60 positive including 30 were malignant, 23 were non-malignant, the positivity being 53.6%. 13 samples were inadequate.

Diagnostic yield of Bronchial wash showed a positivity of 43% Bronchial brush showed a positivity of 62% and Endobronchial biopsy showed a positivity of 82%

Discussion

Age Distribution of study population:

The most common age group involved in the study was 41-60 years (46.6%). The youngest patient was aged 20 years and the oldest was 85yrs Mean age was 52.96yr.

Sex Distribution:

The total number of patients involved in the study were 75. Out of which 60 (80%) were male and 15 (20%) were female. Male patients outnumbered female patients

Adequacy of samples:

Bronchial washings are considered adequate when smear

showed carbon laden macrophages and or endobronchial cells with or without squamous epithelial cells even when cellularity is lower.

Bronchial brushings also considered adequate by the presence of endobronchial cells or carbon laden macrophages with or without squamous epithelial cells. In a Study done by AB Fuladi, RP Munje, BO Tayade⁶ the number of cases that a particular procedure would pick up is calculated. The brushing was positive in 61.53%, washing in 70.76%, and biopsy in 76.92%. The overall diagnostic yield was 80% for cancer

GAURE et al (2007)⁷ in a study of 181 patients (51 cases proven as lung cancer) found the sensitivity of bronchial brushings to be 81.5% as compared to 62.5%

Out of 19 non neoplastic cases in Bronchial brushings, the inflammatory lesions were acute inflammatory process (8) Broncho pneumonia (1), aspergilloma (2) and AFB+ granulomatous lesions (6), interstitial lung disease (2). Malignant cases amount to about 29% of the cases and inflammatory lesions amount to about 25%.

Bronchial washings could detect only 2 malignant cases, with 4.8% positivity including the non-neoplastic inflammatory lesions. The bronchial brushings showed 65% positivity out of which 34.9% were malignant and 30.15% were inflammatory lesions

Out of the 75 cases Bronchial biopsy showed 60 positive including 30 were malignant, 23 were non-malignant, the positivity being 53.6%. 13 samples were inadequate.

Study done by Rawat J, Sindhvani G, Saini S, Kishore S, Kusuma, Sharma⁸ 107 cases of endoscopically visible abnormality underwent forceps biopsy, brushing and washing. In 99 patients bronchoscopy revealed a clear diagnosis (92.52%). The sensitivity of endobronchial biopsy, brushing and washing for diagnosing lung cancer was 83.17%, 69.15% and 47.66% respectively

The results were subjected to a statistical test called McNemar's test. It is a non parametric method used on nominal data applied at 2x2 contingency tables with dichotomous data with matched pair of subjects

Some investigators found that combination of fine needle aspiration with percutaneous core needle biopsies increased sensitivity.

However advantage of brushing is that it is simpler take less time, easier to perform, complications are less when compared to biopsy. Combination of brushings and biopsy ideal for definitive diagnosis, but brushings also gives equally good results as biopsy. Fuladi et al studied Value of BW, BB, and EBB at Fiberoptic Bronchoscopy in the Diagnosis of Lung Cancer. In this study, 90 patients with clinic radiological picture suspicious of malignancy underwent Bronchoscopy showed BB was positive for malignant cells in 61.53%, BW in 70.76%, while EBB was positive in 76.92%. Overall diagnostic yield by all three sampling techniques was found to be 80%.⁹

In our study Endobronchial biopsy showed positivity of 82.6% which when compared to Bronchial washings 4.8% and bronchial brushings 53.6% is much significant. This data was subjected to Fisher's test which showed significant difference in the positivity in EBB.

Kevin et al in their study statistically proved that fluorescent in situ hybridization (FISH) was more sensitive than conventional cytology for detecting lung cancer in bronchial brushings specimens. When FISH was combined with cytology, FISH could improve the diagnostic sensitivity of detecting malignancy in bronchial brushings. In future immunocytochemical or molecular methods with hnRNP a ribonucleoprotein that can be demonstrated by antibody A2/B1 can be useful in earlier diagnosis with bronchial washings and brushings. In such situations the most effective, with better diagnostic yield only can be used to be cost effective as materials used for immunohistochemistry, FISH are expensive.

Thus this study tries to compare the diagnostic utility between brushings and washings, as either one of the two can only be used for above mentioned expensive tests in countries like India.

Chart 1: outcome of Bronchial washings and brushings

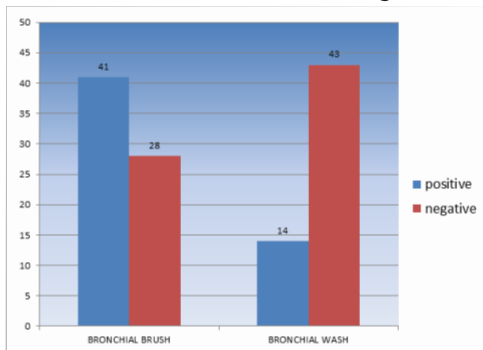


Table 1: Malignant and non malignant cases detected by bronchial brushings

BB	MAGN	NON MALGN	TOTAL
POS	22(34.9%)	19(30.5%)	41(65%)
NEG	2(3.1%)	20(31.9%)	22(35%)
TOT	24(38%)	39(62%)	63(100%)

Chart 2: Bar diagram comparing bronchial brush and biopsy

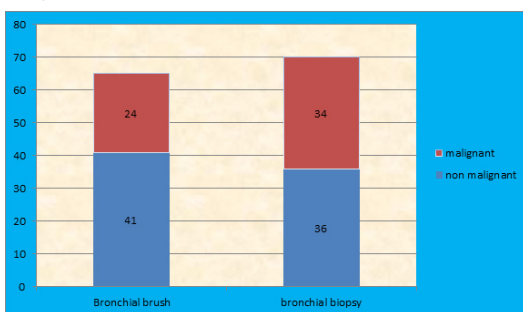


Chart 3: Pie diagram representing distribution of malignant case

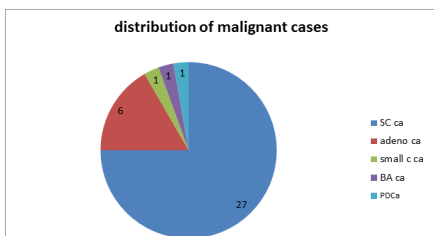
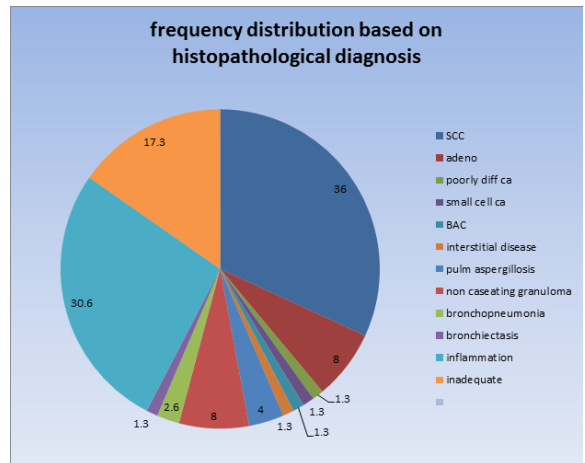


Table 2: Diagnostic yield of three different procedures

Technique	Negative for malignancy	Positive for malignancy	%positivity
BW	43	14	43
BB	28	41	62
EBB	2	60	82

Chart 4: Pie diagram showing frequency distribution based on histopathological diagnosis



References

1. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, et al. GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11. Lyon, France: International Agency for Research on Cancer; 2013. Available from: <http://globocan.iarc.fr>, accessed on January 21, 2014.
2. Jindal SK, Behera D. Clinical spectrum of primary lung cancer – review of Chandigarh experience of 10 years. Lung India 1990; 8: 94-8
3. Fernandez A, Jatene FB, Zamboni M. Diagnosis and staging of lung cancer. J Pneumol. 2002; 28(4): 219-28.
4. Vishnu SM, Pradeep NP, Anupama N, Mithra PP. Bronchoscopic evaluation and final diagnosis in patients with chronic non productive cough with normal chest X ray. Online J Health Allied Scs. 2010;9(2):8.
5. Marluce Bibbo, Comprehensive cytopathology, second edition, W.B.Saunders company 1997, 325 – 389
6. AB Fuladi, RP Munje, BO Tayade, maket al. Value of Washings, Brushings, and Biopsy at Fiberoptic Bronchoscopy in the Diagnosis of Lung Cancer
7. DS Gaur, A Kusum, M Harsh, S Kohli, S Kishore, VP Pathak. Efficacy of bronchial brushings and trans-bronchial needle aspiration in diagnosing carcinoma lung.
8. J. Rawat1 , G. Sindhwani2 , S. Saini3 , S. Kishore4 , A. Kusum5 and A Sharma Lung India 2007; 24 : 139-usefulness and cost effectiveness of bronchial washing in endobronchial malignancies
9. Koss's diagnostic cytology and its histopathologic bases, fifth edition, Lippincott Williams & Wilkins, 2009; Vol 1, 652.