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### **Comparative study of efficacy of brush cytology and transthoracic fine needle aspiration cytology in the diagnosis of bronchogenic carcinoma**

For long time, bronchoscopic biopsy for histopathology remains the standard in the diagnosis of bronchogenic carcinoma<sup>1-3</sup>. The diagnostic yield from biopsy of bronchoscopically visible tumors, occupying the lumen of bronchus is over 90%<sup>3</sup>. The yield from the bronchoscopically visible but deep seated or intramural tumor is 50-60%<sup>3</sup>. In cases of peripheral tumors, the diagnostic yield is much lower. The process usually fails in small peripheral lesions, in the lesions where the bronchi become fibrosed or narrowed, so that the bronchoscope could not reach the site of the lesion<sup>3</sup>. Bronchial cytobrushing, an ancillary process done during bronchoscopy, yields better results. Bronchial cytobrushing could be done from area of suspicion, having chance of uncertain biopsy<sup>3</sup>. By examination of the bronchial brush specimen, it is now possible to make a diagnosis in 80-90% of patients with lung carcinoma<sup>4</sup>. Transthoracic fine needle aspiration cytology (FNAC) is another pulmonary diagnostic procedure, widely practiced throughout the world. It is a safe, speedy and effective method in the diagnosis of bronchogenic carcinoma. It can be performed on out-patient basis, requiring no or only local anesthesia. It has wide patient acceptance as it is less traumatic and minimally invasive<sup>5</sup>. It can be done anywhere in the thorax under image guidance, especially under CT-guidance<sup>6</sup>.

The aim of this study was to find out the efficacy of transthoracic fine needle aspiration cytology and brush in the diagnosis of bronchogenic carcinoma

and to compare cytopathological finding of transthoracic FNA and brush cytology with histopathological findings of bronchoscopic specimen and to assess the reliability of 2 cytological techniques.

Seventy (58 males; 12 females; mean age 60.2 years) clinically suspected patients of bronchogenic carcinoma were selected. Patients having any clinical feature suspicious of lung cancer with non-resolving shadow in the chest x-ray in spite of proper antibiotic treatment, were included.

Transthoracic FNA were done in all cases (under CT-guidance in central and deep lesion- 43 cases; USG guidance in lesions close to chest wall- 17 cases; with the help of chest X'ray- 9 cases). FNA were done by spinal 25 gauge sterile needle, attached with 10 mL sterile syringe. Smears were fixed by 95% ethyl alcohol and stained according to Papanicolaou's stain. Bronchoscopy was possible in 54 cases. Of the remaining cases, bronchoscopy was refused by 7 patients and 9 patients were not suitable for bronchoscopy. Out of 54 patients, biopsy was taken in 43 cases, where endobronchial lesions were seen. Slide was prepared and hematoxylin and eosin stain were done. Brush was taken from 42 patients. Smears preparation and fixation and staining were done similar to those of FNAC.

Cytobrushing were done in 42 cases. Of them, biopsy was possible in 34 cases only (Table I).

No lesion was seen in 11 patients by bronchoscope. Lesions were seen in 43 cases from where biopsy was taken for histopathological examination (Table II). The statistical evaluation of the findings of FNAC and brush are shown in Table III.

Complications were minimum in this study. In FNAC, 6 (8.57%) patients developed small pneumothorax, which disappeared spontaneously. Mild hemoptysis occurred in 3 patients (4.29%), which were transient and required no treatment. In cases of brush with biopsy, 5 (11.19%) patients developed hemoptysis, which were self-limited.

As the incidence of bronchogenic carcinoma continues to rise, there is increased need to establish diagnostic protocols that are simple, rapid and reliable. Among these, the cytologic evaluation of bronchial brushings and FNA samples has become widely established. However, the relative value of these two modalities remains the subject of debate. This study was aimed to find out the efficacy of transthoracic FNA and bronchial brush cytology in

the diagnosis of bronchogenic carcinoma with their cyto-morphological pattern and to analyze the relative values of them in comparison to bronchoscopic biopsy, taken as the final standard.

The high rate of sensitivity and negative predictive value were due to small number of cases in this study group. Similar finding

(sensitivity 100%) was found in the study of Jain et al (1997)<sup>7</sup> in which the sample size was 45.

There was one false positive case in FNAC in this study. But brush biopsy report was found similar to FNAC report in that case. Possibly the bronchoscopic biopsy failed to sample the lesion. Similar cases were seen in the study of Cagle et al

**Table I:** Morphological correlation of brush cytology and histopathological diagnosis

Cytopathological diagnosis by brush (No.)	Histopathological diagnosis							
	Squamous cell carcinoma	Adenocarcinoma	Small cell carcinoma	Large cell carcinoma	Poorly differentiated carcinoma	Suspicious	Benign	Total
Squamous cell carcinoma (22)	21						1	22
Adenocarcinoma (5)		5						5
Small cell carcinoma (1)			1					1
Large cell carcinoma (1)				1				1
Poorly differentiated carcinoma (0)								0
Suspicious (2)	1					1		2
Benign (3)							3	3
<b>Total (34)</b>	<b>22</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>34</b>

**Table II:** Morphological correlation of FNAC and histopathological diagnosis

Cytopathological diagnosis by FNAC (No.)	Histopathological diagnosis							
	Squamous cell carcinoma	Adenocarcinoma	Small cell Carcinoma	Large cell carcinoma	Poorly diff. carcinoma	Suspicious	Benign	Total
Squamous cell carcinoma (29)	28	0	1	0	0	0		29
Adenocarcinoma (7)	1	5	0	0	0	0	1	7
Small cell carcinoma (1)	0	0	1	0	0	0		1
Large cell carcinoma (2)	0	0	0	2	0	0		2
Poorly diff. carcinoma (1)	0	0	0	0	1	0		1
Suspicious (1)	1	0	0	0	0	0		1
Benign (2)	0	0	0	0	0	0	2	2
<b>Total (43)</b>	<b>30</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>43</b>

**Table III:** Statistical evaluation of transthoracic FNAC and brush in the series

Method	Sensitivity	Specificity	Predictive value		Accuracy
			Positive	Negative	
FNAC	100%	66.6%	97.50%	100%	92.86%
Brush	100%	75%	96.55%	100%	87.50%

(1995)<sup>8</sup>. They showed 11 cases, where FNACs were positive for malignancy but the biopsies failed to sample the lesion. In the present study, the specificity of FNAC was lower than that of many other studies. The presence of 1 unwanted false positive case and fewer numbers of true negative cases made the specificity lower.

In this study, 7 (10% of the total cases) cases positive for malignancy in FNAC, were negative in bronchoscopy. The lesions were beyond the reach of bronchoscope. However brush biopsy was taken in 5 cases and all were found malignant. These cases were not included in statistical evaluation due to lack of histopathological confirmation. Clinically, they were malignant and treated accordingly. Similar findings were also seen in the series of Rahman et al (2000)<sup>2</sup>, Ahmad (1998)<sup>9</sup>, in which most of the peripheral lung lesions were found bronchoscopically negative, though they were definitely diagnosed as malignant by FNAC or/and by brush biopsy.

Complications were minimum both in FNAC and brush in the present study. These findings were closed to those of Wallace et al (2000)<sup>6</sup>, Quiyyum et al (2000)<sup>10</sup>.

In conclusion, both the cytological processes i.e. transthoracic FNAC and cytobrushing are the effective, safe and reliable methods in the diagnosis of bronchogenic carcinoma.

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#### Angiographic profile in patients with congenital anomalous origin of the coronary arteries

Coronary artery anomaly occurs in less than 1% of the general population. It is frequently found in association with other major congenital cardiac defects. This letter focuses on isolated coronary artery anomalies (i.e., in the absence of other major congenital cardiac defects). In adults, the clinical interest in coronary anomalies relates to their occasional association with sudden death, myocardial ischemia, congestive heart failure, or endocarditic. In addition, presence of coronary artery anomalies may, at times, create challenges during coronary angiography, percutaneous coronary interventions and coronary artery bypass surgery<sup>1-4</sup>. Accordingly this study was done to evaluate the anatomical patterns, frequency of occurrence and significance of coronary artery anomalies in patients studied angiographically for proper management of the patients.

This study included 4,000 patients who underwent coronary angiography from 2004 to 2007 in a single center. Clinical histories, physical examinations, noninvasive laboratory studies, catheterization data and follow-up surveys were obtained. Patients with coronary anomalies occurring as part of congenital complex heart disease were excluded in this study. Patients with isolated coronary artery anomalies were included in the study. Anatomically, patients were classified into two groups: those with anomalies of origin and distribution and those with coronary artery fistulae. Clinically anomalies may be arbitrarily divided into benign and potentially dangerous.