TRANSTHORACIC FINE NEEDLE ASPIRATION BIOPSY: An Appraisal of Its Diagnostic Accuracy

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SUMMARY

28 cases with intrathoracic space-occupying lesions who had computerized tomography (CT) guided transthoracic Fine Needle Aspiration Biopsies (FNAB) had been critically analyzed with respect to the degree of correlation between the cytological and the clinical/histological diagnosis. This showed an accuracy rate of 96%, placing CT guided FNAB in the armamentarium of thoracic diagnostic modalities.

Key words: Thorax, Needle Biopsy, Cytology.

INTRODUCTION

Pulmonary needle biopsy was first introduced by Leyden in 1883 and had to wait for 3 years for Menetrier to perform it in the diagnosis of neoplastic disease. With the help of the emerging chest imaging modalities, this procedure was utilized extensively in the diagnosis of intrathoracic space-occupying lesions via the transthoracic route (1,2). Modern computerized tomography (CT) can identify the lesions as small as 1 cm in diameter with additional information with regard to localization and nature allowing the pulmonologist to apply fine needle asiration biopsy (FNAB) to a wide range of lesions (3). In this paper, we report our experience with the CT guided transthoracic FNAB and its diagnostic accuracy.

MATERIAL AND METHODS

Material consisted of 28 cases of transthoracic CT guided FNAB with adequate cell population received in our laboratory from various departments of radiology and pulmonology in İzmir. 27 specimens were from pulmonary lesions and the other was from a mediastinal lesion. The smears were routinely stained with H&E, and special staining were performed when additional slide were available. PAP Classification (Table I) was used for cytological diagnosis with an attempt to identify cell type when possible. Cytological diagnoses were compared to the final histological and/or clinical diagnoses to determine accuracy.

RESULTS

The distribution of 28 cases to PAP Categories are shown in Table II. Neoplastic cell type was identified in 19 of the 24 positive cases, and all 19 were in the PAP V category. 13 of the 19 patients had subsequent histological diagnoses. A comparison of the cytomorphological diagnoses with the histological diagnoses of these 13 patients is shown in Table III. One of the 3 patients in PAP III died of lung cancer and 2 were lost to follow-up. The only PAP II case was later found to be Mucoid Impaction (4) on examination of the lobectomy specimen. There were no false-negative diagnoses in the 24 cases with sufficient follow-up, but there was 1 case with a false-positive diagnosis (PAP IV) which actually was an opportunistic pulmonary infection. Of the remaining 21 positive cases with follow-up 1 had metastatic disease from a previously diagnosed transitional cell carcinoma of the urinary bladder while the rest had primary pulmonary malignancies.

DISCUSSION

The results in our group of 24 cases show an accuracy rate of 95.8% suggesting that FNAB cytology is a reliable diagnostic method. Our results are in agreement with that of the literature (1,3,5,6). In the current medical practice, any patient with demonstrable radiographic abnormality in the lung fields is a candidate for FNAB provided that an experienced cytopathologist is available (1,2,6). The cytologist must attempt to identify the neoplastic cell type since it is highly relevant to the clinical management (5). As shown in Table III cytomorphological cell typing matches the histological cell typing in 9 of the 13 cases. A comparison of the cytological cell typing to histological structure was not possible due the fact that most histological diagnoses were obtained in laboratories other than ours with erratic elaboration of structure. Thornbury et al. reported 86% agreement between cytology and histology in squamous, adeno- and small cell undifferentiated carcinomas in a series of 162 cases and recommended the cytologist to type the

neoplastic cells (5). The success of transthoracic FNAB depends on equipment, technique, skill and experience, which is further enhanced by cooperation of the physicians involved (6). It is indicated in patients with negative sputum, bronchial brushing, and washing studies. It should be performed earlier than the more invasive interventions such as thoracotomy (2).

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TABLE I. PAP CLASSIFICATION

PAP 0	No representative cells
PAP I	Normal Cytomorphology (Negative)
PAP II	Inflammation related cellular changes (Negative)
PAP III	Cells suspicious for malignancy (Suspicious)
PAP IV	Cells strongly suggestive of malignancy (Positive)
PAP V	Malignant cells (Positive)

TABLE II. THE DISTRIBUTION OF 28 CASES TO PAP CATEGORIES.

CLASSIFICATION	Nr. of CASES
PAP I	None
PAP II	1
PAP III	3
PAP IV	1
PAP V	23
TOTAL	28

TABLE III. COMPARISON of the CYTOMORPHOLOGICAL DIAGNOSES WITH HISTOPATHOLOGY.

TUMOR TYPE*	Nr. of CYT. DIAG	Nr. of HIST. DIAG	CYTOMORPHOL. CORRELATION
SCC	6	4	3
AdeC	8	5	3
LCUC	2	1	1
SCUC	1	1	1
THYM	1	1	1
CARD	1	1	-
TOTAL	19	13	9

* ABBREVIATIONS of the TABLE III.

SCC : SQUAMOUS CELL CARCINOMA
AdeC : ADENOCARCINOMA
LCUC : LARGE CELL UNDIFFERENTIATED CARCINOMA
SCUC : SMALL CELL UNDIFFERENTIATED CARCINOMA
THYM : MALIGNANT THYMOMA
CARD : CARCINOID

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