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## Echocardiographic Evaluation in Mediastino-pulmonary Malignancy

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### ABSTRACT

**Background:** As any cardiac involvement may worsen the prognosis of mediastino-pulmonary tumors, this study was designed to evaluate the function and anatomy of heart by echocardiography in this group of patients.

**Materials and Methods:** Medical records of 76 patients were reviewed for age, sex, type of malignancy, and cardiac consultation report. The patients underwent transthoracic echocardiography. Moreover, descriptive statistical methods were used for data analysis.

**Results:** The study population included 58 males and 18 females, with the mean ( $\pm$ SD) age of  $50.70 \pm 15.14$ . 71 out of 76 cases had normal LV function, 2 revealed to have severe pulmonary hypertension, and 9 had significant pericardial effusion. Furthermore, intra and extracardiac masses were observed in 5 patients. Severe mitral regurgitation and tricuspid regurgitation were also reported.

**Conclusion:** Echocardiography is a useful noninvasive approach to determine cardiac involvement in the patients suffering from thoracic malignancies. (*Tanaffos* 2002; 1(2): 47-50)

**Key words:** Mediastino-pulmonary malignancy, Echocardiography, Cardiac metastasis.

### INTRODUCTION

Lung cancer comprises more than one fourth of all cancer mortality. Common primary sites for metastatic heart neoplasms are lungs. (1,2)

The prognosis of lung cancer may be worsening when heart is involved (3,4). It has been proved that echocardiography is a noninvasive diagnostic method for tumoral cardiac involvement (5,6,7).

The present study was carried out in NRITLD to determine the echocardiographic findings in

mediastino-pulmonary malignancies.

### MATERIALS AND METHODS

Between September 2000 and April 2001, medical records of 76 patients admitted with mediastino-pulmonary malignancy in our center were reviewed. The patients underwent transthoracic echocardiography (Ving Med CFM 750). According to the ejection fraction (EF), the patients were distributed in either of the four groups: normal ( $EF \geq 50$ ), mildly reduced ( $40 \leq EF < 50$ ), moderately reduced ( $30 \leq EF < 40$ ), and severely reduced ( $EF < 30$ )

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left ventricular (LV) function. Meanwhile, based on tricuspid regurgitation, systolic jet, and pulmonary artery pressure (PAP), the patients were classified as follows:

- Without pulmonary hypertension (PAP =  $25 \pm 5$  mmHg)
- Mild pulmonary hypertension (PAP =  $35 \pm 5$  mmHg).
- Moderate pulmonary hypertension (PAP =  $45 \pm 5$  mmHg)
- Severe pulmonary hypertension (PAP =  $55 \pm 5$  mmHg).

## RESULTS

The study population included 58 males (76%) and 18 females (24%) with the mean ( $\pm$ SD) age of  $50.7 \pm 15.14$  years old. The mean ejection fraction was  $56.4 \pm 6.22$  percent. Squamous cell carcinoma was by far the most common malignancy in our patients (38%). (Table1)

**Table 1.** Frequency of mediastino-pulmonary malignancy, NRITLD, 2000-2001

Malignancy type	Frequency(%)
Squamous cell carcinoma	29(38)
Adenocarcinoma	18(24)
Small cell carcinoma	10(13.2)
Undifferentiated non- small cell	8(10.5)
Carcinoid	4(5.3)
Undifferentiated lung cancer	3(4)
Blastoma	2(2.6)
Bronchoalveolar	1(1.2)
Choriocarcinoma	1(1.2)
Total	76(100)

Of 76 patients, 71(93.5%) had normal LV function ( $EF \geq 50\%$ ), 4(5.3%) revealed to have mildly reduced LV function ( $40 \leq EF < 50$ ), and one (1.2%) presented with moderately reduced LV function.

62 patients (81.6%) presented no sign of pulmonary hypertension, whereas mild, moderate, and severe

pulmonary hypertension were reported in 6(8%), 6(8%), and 2(2.4%) patients, respectively. 14 patients (18%) revealed to have pericardial effusion (5 trivial, 4 mild, 3 moderate, and 2 massive). Clinical tamponade was not seen during the study.

5 Patients had tumoral cardiac involvement, four of them had extracardiac masses with compression effect on cardiac chambers, and one had an intracardiac mass.

6 cases of mitral regurgitation (2 trivial, 4 mild) and 17 cases of tricuspid regurgitation (13 mild, 4 moderate) were also noted.

## DISCUSSION

Improving capabilities, accuracy, and the low cost of echocardiographic imaging, made cardiac evaluation easier; however, echocardiography alone can not identify the malignant or benign nature of the tumors (8,9,10,11).

Among our study population, 93.5% had normal LV function and 81.6% had no evidence of pulmonary hypertension. Functional involvement seems to be a terminal phenomenon, which may not be seen until the late stages of a malignant process, unless underlying heart / lung disease is present.

The reported rates of either pericardial effusion or metastases differ in various studies. In our study about 12% of the patients had a considerable pericardial effusion and 1.3% had an intracardiac mass (metastatic mass).

Extracardiac mass with compression effect was seen in 5.2% of the cases. Valvular involvement (especially mitral regurgitation) would be found as an incidental finding, which should be studied further in other studies. Echocardiography is a noninvasive and available method for detecting cardiac involvement in the patients suffering from thoracic malignancies.

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