A STUDY OF SUPERIOR VENA CAVA OBSTRUCTION SYNDROME

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ABSTRACT

Superior vena cava obstruction syndrome was studied in 22 patients with a view to assess the etiological pattern and clinical profile. It was found that 4 patients (18.1%) had benign disease and the remaining 18 (81.9%) patients had malignancy. In 13 patients (59.9%) obstruction occurred due to bronchogenic carcinoma. No complications occurred with invasive diagnostic procedures. All heavy smokers (59.9%) were found to have malignancy. Normal lung fields on chest radiography and CT scan with superior vena obstruction syndrome suggested benign disease in 2 cases.

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KEYWORDS : Superior vena cava syndrome; Mediastinum; Bronchogenic carcinoma.

Introduction

The superior vena cava obstruction syndrome (SVCOS) was first described by William Hunter in 1757 as a complication of syphilitic aortic aneurysm [1]. The decline of syphilis and tuberculosis, and the increasing practice of cigarette smoking has changed the etiological pattern of SVCOS during the course of this century [2]. Today SVCOS is considered to be an ominous sign of malignant disease [3]. We undertook this study to evaluate the etiological causes, clinical patterns and diagnostic procedures in patients presenting with SVCOS.

Material and Methods

All patients presenting to the Department of Respiratory Medicine of Army Hospital Delhi Cantt from July 1993 to June 1994 and found to have engorged, pulseless neck veins were included in the study. A detailed history, clinical examination, sputum studies, chest radiogram, bronchoscopy, CT scan thorax and ultrasound scan of abdomen was done in all cases. A tissue diagnosis was established after either fine needle aspiration cytology (FNAC), bronchoscopic biopsy, mediastinoscopy or open biopsy as indicated. MRI was performed wherever warranted.

Results

Total number of patients included in the study were 22 of whom 18 were male and 4 were female. The age ranged between 21 years and 78 years. Thirteen patients were heavy smokers, 3 were light smokers and 6 were non-smokers. In 8 patients, the duration of symptoms was less than 3 months, whereas 11 patients had symptoms for between 3 and 6 months duration. Only 3 patients had symptoms for longer than 6 months.

The symptomatology is presented in Table 1. The most common symptoms were cough, weight loss and facial puffiness. The associated findings on clinical examination are tabulated in Table 2. Aortic regurgitation observed in 1 patient was due to bicuspid aortic valve. Seven patients had clinical signs of pleural effusion, which was on the right side in all.

The radiological pattern of disease is shown in Table 3. CT scan with and without contrast was carried out in all cases. It showed typical findings of pooling of contrast in peripheral and central veins of the thorax and mediastinum. In 20 patients a mass obstructing the SVC or in proximity to it was seen. MRI was done in 3 cases for problem solving (Fig 1). Pooling of contrast in veins, accompanied by a retrosternal goitre is shown in Fig 2.

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TABLE 1
Symptomatology in 22 cases of superior vena cava obstruction syndrome

Symptom	No of patients
Cough	14
Weight loss	14
Facial puffiness	12
Dyspnoea	9
Chest pain	7
Generalized weakness	7
Hoarseness of voice	3
Oedema of arm	3
Haemoptysis	3
Fever	2
Backache	1
Central choking	1

TABLE 2
Associated clinical findings in 22 cases of superior vena cava obstruction syndrome

Axillary lymphadenopathy	1
Supraclavicular lymphadenopathy	4
Vocal cord palsy	3 (right-1, left-2)
Aortic regurgitation	1
Phrenic nerve palsy	1
Hepatomegaly	2
Pleural effusion (right)	7 (Haemorrhagic-6)

TABLE 3
Distribution of lesions on chest radiography in superior vena cava obstruction syndrome

Mediastinal mass alone	7
Parahilar mass alone (right)	2
Parahilar mass, collapse (right) upper lobe	5
Opaque hemithorax (right)	3
Rt lower lobe mass, paratracheal mass (right)	1
Lt lower lobe mass, paratracheal mass	1
Diffuse patchy lesion	1
No lesion	2
	22

It was possible to establish a diagnosis in all 22 patients. The diagnostic procedure that yielded a tissue diagnosis in 6 patients was FNAC of the lung. In 3 patients FNAC of the mediastinum provided the diagnosis. In another 4 cases FNAC

Fig. 1: MRI showing large thymoma in close relation to trachea and Rt main bronchus.

Fig. 2: CT scan showing retrosternal goitre surrounding the trachea.

from supraclavicular or axillary nodes gave the diagnosis. Bronchoscopic biopsy in 4 patients and mediastinoscopic biopsy in 3 patients was diagnostic. Open biopsy was required in 2 patients. No complication due to any of the procedures was seen.

Histopathological diagnosis in all these patients is shown in Table 4. Thirteen patients had bronchogenic carcinoma and 3 had malignant thymoma. There were 2 cases of lymphoma. Among the benign diseases were fibrosing mediastinitis in 2 patients. Retrosternal colloid goitre and tubercular lymphadenopathy were seen in 1 patient each. Only 1 patient with benign disease was a mild

smoker. All benign cases had symptoms for more than 3 months and 3 had symptoms for more than 6 months. Two of these patients had normal lung parenchyma on chest radiography and CT scan.

TABLE 4
Histological diagnosis in 22 cases of superior vena cava obstruction syndrome

Diagnosis	No. of patients
Malignant	18 (81.9%)
Bronchogenic carcinoma (13)	
Squamous cell carcinoma	5
Small cell carcinoma	4
Adenocarcinoma	4
Primary mediastinal tumour (5)	
Thymoma	3
Lymph node tumours	
Hodgkin's lymphoma	1
Non-hodgkin's lymphoma	1
Benign	4 (18.1%)
Colloid goitre	1
Tubercular lymphadenopathy	1
Fibrosing mediastinitis	2

Discussion

The superior vena cava is formed at the lower border of the first right costal cartilage, close to the sternum, by the union of the two brachiocephalic veins. It is a low pressure valvelers tube, 7 cm long and 2 cm wide, terminating in the right atrium. The azygos vein arches over the right main bronchus from the posterior mediastinum to enter the SVC and links it to the inferior vena cava.

This link is an important decompression pathway should the SVC obstruct below the azygos [4]. Over a period of time, collaterals develop to the inferior vena cava (IVC) through deep and superficial channels. This accounts for the improvement albeit at the cost of unsightly serpiginous abdominal wall veins. The SVC is closely related to the right main bronchus, aortic arch, ascending aorta, thymus and is surrounded by lymph nodes. Enlargement of any of these structures, including a retrosternal goitre, tends to compress it.

In our study 81.9 per cent of the patients had malignancy. This finding is similar to that reported earlier. Yellin et al found an incidence of 82.5 per

cent in their series [5] whereas Tayade et al reported that 89 per cent of cases were due to malignancy [6]. The commonest malignancy seen was bronchogenic carcinoma usually on the right side. However, we had one patient with diffuse bilateral adenocarcinoma and another in whom the primary growth was in the left lower lobe. The incidence of malignant thymoma in the present series is higher than in other series [5-6] but the explanation is not clear.

The earlier teaching has been that radiotherapy should be given to all patients of SVC obstruction before any invasive diagnostic procedure is performed as the risk of complications is high [3,7]. However, this has not been the experience of others [8]. We were successful in establishing a tissue diagnosis in every case and found that biopsy procedures were safe. The bleeding was usually of short duration and could be controlled easily. No patient developed laryngeal oedema as a complication of bronchoscopy.

A thorough clinical examination was found to be rewarding as detection and FNAC of supraclavicular or axillary nodal enlargement gave the diagnosis in 4 cases. Though the present series is small it is our contention that non-smokers who have prolonged symptoms of SVC obstruction are likely to have benign disease. MRI was done in 3 cases. In 2 of these patients the chest radiogram and CT scan showed no compressing mass lesion. MRI was also non-diagnostic. In these 2 patients we considered thrombosis of SVC and fibrosing mediastinitis in the differential diagnosis. Both cases were later proven to be of fibrosing mediastinitis on histopathological examination. In the third patient MRI was performed to rule out aneurysm of ascending aorta as the patient had aortic regurgitation with invasive thymoma. MRI clearly delineated normal aortic anatomy.

In conclusion, our study has shown that 80 per cent of cases of SVC obstruction are due to malignancy. In SVCOS invasive diagnostic procedures can be safely performed. Factors that favour benign lesions are a non-smoker status, presence of prolonged symptoms and normal chest radiogram.

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