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ORIGINAL ARTICLE

A Review of Superior Vena Cava Obstruction in Hong Kong Chinese Patients

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ABSTRACT

Superior vena cava obstruction is, in the majority of patients, due to the presence of a malignant tumour within the mediastinum, i.e. lung cancer and lymphoma. It is usually highly responsive to radiotherapy, regardless of the underlying tumour type. This article briefly reviews the diagnosis, presentation, and results of radiotherapy in a total of 49 patients with superior vena cava obstruction who presented to the department of clinical oncology at the Pamela Youde Nethersole Eastern Hospital between 1 January 1996 and 31 December 1999. Lung cancer accounted for the majority of cases of superior vena cava obstruction. The most common presenting symptoms were facial and upper limb oedema; all patients presented with a history of symptoms of less than 3 months duration. The median survival was 6 weeks after diagnosis. Radiotherapy was well tolerated and produced good symptom relief.

Key Words: *Lung cancer, Mediastinum, Radiotherapy, Superior vena cava obstruction, Symptom relief*

INTRODUCTION

Superior vena cava obstruction (SVCO) was first described by Hunter in 1757 in a patient with a syphilitic aneurysm of the ascending aorta.[1] Nowadays, the majority of cases are due to malignant tumour within the mediastinum — namely, lung cancer and lymphoma.[2] The pathology of SVCO is extrinsic compression of the large central veins feeding into the heart, sometimes accompanied by intravascular tumours or thrombosis. The presenting symptoms are dyspnoea, dilatation of neck veins, and swelling of soft tissues of the face, neck, and upper limbs. Headache and other cranial symptoms may occur as a result of cerebral oedema.[3,4] SVCO often arises acutely and should be treated as an oncological emergency.[5] It is usually highly responsive to radiotherapy (RT), regardless of tumour type.[6] Therefore, active treatment should be considered unless the patient is extremely ill, or is unable or unwilling to attend for RT.[7] High-dose corticosteroid therapy is usually given to reduce oedema associated with mediastinal tumour.[8] Recently, it has been suggested that an accurate histological diagnosis be obtained in advance in order to establish the correct, effective therapy.[5] Symptomatic relief following irradiation is reported in 50% to 90% of cases; survival of patients with SVCO is determined by their underlying disease rather than by the syndrome itself.[9-11]

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PATIENTS AND METHODS

The present study is a retrospective analysis of patients with SVCO who presented to the department of clinical oncology, Pamela Youde Nethersole Eastern Hospital, Hong Kong, between 1 January 1996 and 31 December 1999. Medical records of these patients were retrieved and analysed, specifically for diagnosis, symptom(s), duration of presenting symptom(s), symptomatic relief, and RT dosage (dose/fraction, number of fractions, total dose, and overall treatment time).

Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (version 8.0). Unless otherwise stated, all results are expressed as number [no.] (%) or mean ± standard deviation (SD) where appropriate.

RESULTS

A total of 49 patients were analysed in this study. There were 34 (69.4%) male and 15 (30.6%) female patients.

The median age at presentation was 69 years (range, 15 to 86 years). The mean follow-up time was 10.6 ± 11.9 weeks (range, 0.1 to 50.0 weeks). Symptoms at presentation were as follows: facial and upper limb oedema in 36 patients (73.5%), dyspnoea in 30 (61.2%), distension of neck veins in 30 (61.2%), chest pain in 3 (6.1%), and cough in 12 (24.5%). None of the patients presented with symptoms of increased intracranial pressure. The mean duration of presenting symptoms was 26.8 days (range, 1 to 90 days). All patients presented with a history of symptoms of less than 3 months duration. Among the 49 patients, 38 (77.6%) had a histological diagnosis while 11 (22.4%) had a clinical diagnosis only. The patients' diagnoses are summarised in Table 1.

Forty eight patients (98.0%) received RT. The remaining patient was too sick to receive active treatment. Forty one patients completed the course of RT and the median total dose was 28 Gy in seven daily fractions over 10 days. The results of treatment in different groups of patients are summarised in Table 2. Overall, symptomatic relief was reported for 38 patients (79.2%).

Table 1. The diagnoses of patients with superior vena cava obstruction

Diagnoses	No. (%)
NSCLC	33 (67.3)
SCLC	6 (12.2)
Lymphoma	2 (4.1)
Carcinoma of thyroid	1 (2.0)
Thymoma	1 (2.0)
Metastatic carcinoma	6 (12.2)

Abbreviations: NSCLC = non-small cell lung cancer; SCLC = small cell lung cancer.

Table 2 Results of treatment in different groups of patients with superior vena cava obstruction

Patient group	No. (%)	Symptom relief after RT (%)
NSCLC	33 (67.3)	78.8
Other diagnosis	16 (32.7)	81.3
Corticosteroid therapy and RT	39 (79.6)	76.9
RT only	9 (18.4)	100

Table 3. Improvement of patients' symptoms after radiotherapy (RT)

Symptom	Symptom relief after RT (%)	Median duration of symptom relief (weeks)
Dyspnoea	73.3	6.6 ± 2.0
Facial and upper limb oedema	80.6	13.9 ± 3.4
Distension of neck veins	76.7	14.8 ± 4.0
Chest pain	66.7	10.9 ± 6.6
Cough	85.7	7.7 ± 3.7

The percentage and duration of symptomatic relief are summarised in Table 3. Of the 40 patients who started dexamethasone before RT, 30 (75.0%) had decreased dexamethasone requirement after RT and 13 (32.5%) eventually stopped the corticosteroid altogether. The median survival of the whole group was 6 weeks (range, 1 to 56 weeks) after diagnosis.

DISCUSSION

The majority of patients in this study presented with facial and upper limb oedema — a prominent feature causing them to seek medical treatment. The other common presenting symptoms were cough, distension of neck veins, and dyspnoea. None of the patients presented with cranial symptoms due to cerebral oedema. Thus, these findings are in accordance with previously published data showing dyspnoea and facial and upper limb oedema to be the most common symptoms in SVCO,[6,11,12] while cranial symptoms are rare.[9]

Bronchogenic carcinoma accounted for the majority of the cases of SVCO in this series (79.6%), followed by lymphoma. These findings are again consistent with those in the literature.[8,13] However, only patients with malignant disease causing SVCO were included in our review; non-malignant causes such as mediastinal fibrosis and thrombosis of the superior vena cava (which account for a proportion of cases in general hospitals) were not seen here.[14,15] The reason for this may be due to a different referral pattern to a clinical oncology department.

A lower rate of symptom relief was observed in patients receiving both corticosteroid therapy and RT compared with those receiving RT alone (Table 2). The reason for this may be the fact that those who received both corticosteroid therapy and RT had poorer performance status and worse symptoms at the outset; as a result, they responded less well to treatment. On the other hand, patients with milder symptoms and better performance status at presentation did not require corticosteroid therapy and responded well to RT.

In our study, treatment of SVCO was mostly palliative, with a total radiation dose of 28 Gy. According to the literature, a total dose of 20 Gy in five fractions or 30 Gy in 10 fractions is usually adequate for palliation. The choice of total dose and fractionation schedules depends on the histology of the tumour.[16] RT was usually well tolerated and resulted in significant symptomatic improvement. Treatment could be completed in most of the patients (>80%), and the symptoms

that were best controlled included cough and facial and upper limb oedema. Among all the symptoms, relief of the distension of neck veins and facial and upper limb oedema were the most durable.

The treatment results of this study were comparable with most of the reported overseas series.[9-11] For patients with SVCO secondary to non-small cell lung cancer, RT is the primary treatment. The likelihood of relieving signs and symptoms of SVCO is high, but the overall prognosis for these patients is poor.[8,10,11,15] RT has been advocated as standard treatment for most patients with SVCO.[9,17,18] It is used as the initial treatment if a histological diagnosis cannot be established while, at the same time, the clinical status of the patient is deteriorating.[13] Armstrong et al observed improvement of symptoms within 2 weeks or less in 70% of irradiated patients.[11] Serial venography and autopsy findings suggest that the symptomatic improvement achieved after RT is not always due to improvement of flow through the superior vena cava, but is probably also a result of the development of collaterals after the pressure in the mediastinum is eased.[5]

CONCLUSION

RT with a dose of 28 Gy in seven daily fractions in 10 days is usually well tolerated and produces good symptom relief in patients with SVCO. Our retrospective analysis described the outcome of patients treated mainly by RT; the results were in accordance with the existing published literature.

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