

Prognostic Indicators of Outcome in Superior Vena Cava Obstruction in Lung Cancer

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Abstract

A chart review of all histologically confirmed lung cancer patients with clinical evidence of superior vena cava obstruction (SVCO) from 1998-2006 was performed.

132 newly diagnosed SVCO cases were identified. The median age at presentation was 62.9 (42-90) with 74 (56.1%) male and 58 (43.9%) female. Non-small cell lung cancer accounted for 90 (68.2%) of cases. The remaining 42 (31.8%) had small cell histology. Median Karnofsky performance score (KPS) was 70. Goal of treatment was radical in 21 (52.4%) and palliative in 110 (47.6%) patients. One hundred ten patients received radiation and 70 received chemotherapy. Fifty seven patients developed extrapulmonary metastases. During the course of the study, 50 patients developed local relapses and 111 died. On univariate analysis, KPS, goal of treatment, presence of metastases, overall delay in treatment > 14 days, and chemotherapy were significant prognostic factors (Table 1). Of these variables in multivariate analysis, only KPS (p<0.0001, HR 3.09, 1.888-3.092) and chemotherapy (p = 0.0408, HR 1.604, 1.020-2.524) remained significant prognostic indicators of outcome in SVCO.

Prognosis in lung cancer patients with SVCO remains poor. Patients with good performance status should receive radical treatment to improve outcome.

Variable	Hazard Ratio	95% Confidence Interval	P value
Age	1.003	0.984-1.021	0.78
Gender	0.778	0.531-1.141	0.2
KPS	0.976	0.965-0.987	<0.001
Goal of treatment	0.4	0.226-0.706	0.0016
T stage	0.718	0.478-1.076	0.1085
Histology	1.376	0.924-2.051	0.1164
Extent of disease	1.605	1.089-2.366	0.0168
Radiation	1.227	0.761-1.977	0.4017
Chemotherapy	2.109	1.430-3.098	<0.0001
Delay to consultation > 14 days	0.994	0.987-1.001	0.114
Delay to treatment >7 days	0.998	0.986-1.010	0.7427
Overall delay > 14 days	1.521	1.037-2.240	0.0319

Table 1: Univariate Analysis

Introduction

- Superior vena cava obstruction (SVCO)
 - Uncommon oncologic emergency
 - Most often a result of lung cancer
- Several methods to treat SVCO
 - Surgery/Stents
 - Radiation +/- Chemotherapy
- All provide symptom relief > 70%¹
- But what influences prognosis for patients with SVCO?

Objective

- To determine the factors influencing prognosis in patients with SVCO

Materials and Methods

- Chart review of patients between 1998 – 2006
- Included all lung cancer patients (small-cell and non-small cell lung cancer)
- Included any patient with clinical and/diagnostic (imaging) evidence of SVCO

Results

- N = 132 patients
 - Median age 62.9 years old
 - 56.1% male
 - 43.9% female
- Pathology
 - 68.2% non-small cell lung cancer
 - 31% small-cell lung cancer
- Median Karnofsky performance status (KPS) = 70
- Goal of treatment:
 - 52.4% radical
 - 47.6% palliative
- Treatment:
 - 83.3% radiation
 - 53.0% chemotherapy

Prognostic Factor	Hazard Ratio (95% Confidence Interval)	P value
KPS	0.976 (0.965 – 0.987)	<0.001
Goal of Treatment	0.400 (0.226 – 0.706)	0.002
Presence of Metastases	1.605 (1.089 – 2.366)	0.017
Chemotherapy	2.109 (1.430 – 3.098)	<0.0001
Overall Delay in Treatment	1.521 (1.037 – 2.240)	0.032

Table 2: Significant Variables on Univariate Analysis. Of the variables measured in Table 1, the above 5 were significant prognostic factors for SVCO.

- On multivariate analysis, the only significant factors were:
 - KPS: Hazard ratio 3.090 (1.888 – 3.092), P<0.0001
 - Chemotherapy use: Hazard ratio 1.604 (1.020 – 2.524), P = 0.041

Discussion

- Few randomized trials examining management options
- Even fewer studies analyzing prognostic factors
 - Previous work in London, Ontario on SCLC demonstrates the following²:
 - Stage predicted for overall survival
 - Plethora on clinical exam and use of combined therapy over single modality were prognostic on the time from initial SVCO presentation to recurrence of SVCO
 - Another study from Germany examined prognosis of SCLC patients with or without SVCO³:
 - On multivariate analysis, stage I/II vs. III, presence of SVCO, and KPS ≤70 were prognostic for outcome
- Our data suggests chemotherapy use and KPS were significant prognostic factors on multivariate analysis
 - Majority of patients who received chemotherapy also had radiation
 - Our data concurs with previous work suggesting the importance of combined therapy and performance status in prognosis

Conclusion

- Patients with SVCO have an improved prognosis when radical combined therapy is applied
- Radical treatment should be offered to patients with KPS ≥70

References

1. Wilson, LD. *et al.* Superior vena cava syndrome with malignant causes. *NEJM*. 356 (18); pg 1862-1869. 2007.
2. Chan, RH. *et al.* Superior vena cava obstruction in small-cell lung cancer. *IJROBP*. 38 (3); pg 513-520. 1997
3. Wurschmidt, F. *et al.* Small cell lung cancer with and without superior vena cava syndrome: A multivariate analysis of prognostic factors in 408 cases. *IJROBP*. 33(1); pg 77-82. 1995.