

# Intraluminal Superior Vena Cava Invasion



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A 77-year old man presented with dyspnea, left-sided facial swelling, and left facial neuralgia. There was no facial plethora, dilated neck veins, or upper extremity swelling, though collateralization in the anterior chest was observed. Contrast-enhanced computed tomography was done, revealing bulky right paratracheal adenopathy with direct invasion and intraluminal extension of the tumor into the superior vena cava (Fig. 1).

This patient had a history of lung adenocarcinoma, T2N0M0, having undergone thoracoscopic right middle lobectomy 10 years ago. He was followed for 5 years and then discharged without evidence of recurrence.

The patient's condition was diagnosed as superior vena cava obstruction secondary to presumed recurrent lung cancer. Citing extensive medical comorbidities, the patient declined biopsy or consideration of systemic therapy by the medical oncology department. He was referred to a radiation oncologist and started on dexamethasone and ranitidine. The mediastinum was treated with radiotherapy to a dose of 30 Gy in 10 fractions. The patient noted effective palliation of his symptoms, with resolution of facial swelling and pain by the end of treatment. A four-point decrease in patient-reported pain on the Edmonton Symptom Assessment System scale was noted by the end of treatment, although concomitant worsening of appetite, drowsiness, and general well-being was also reported. Follow-up with radiation oncology was booked for 3 months after treatment, but the patient succumbed to progressive disease 2 months later and died in his home as per his wishes.

Superior vena cava obstruction related to malignancy usually results from external compression by the primary tumor or enlarged lymph nodes and/or direct tumor invasion. Lung cancer and lymphoma are the most common causes of superior vena cava obstruction.<sup>1</sup> Benign etiologies, including thrombosis or fibrosis, are less common.

Superior vena cava obstruction is no longer considered a true medical emergency. In the past, immediate

radiotherapy would be considered necessary for patients to relieve the obstruction. Current guidelines recommend that treatment can await the results of an efficient work-up, including histologic or cytologic examination, to allow for optimization of treatment based on the diagnosis.<sup>2</sup> Individualized treatments include endovascular stenting, radiotherapy, and/or chemotherapy.

There are no randomized trials comparing the efficacy of endovascular stent insertion with that of radiotherapy or chemotherapy.<sup>3</sup> Initial chemotherapy is appropriate for chemotherapy-sensitive tumors, including SCLC, lymphomas, and germ cell tumors. Initial radiotherapy is appropriate for radiosensitive tumors, including NSCLCs. Direct tumor invasion causing superior vena cava obstruction is associated with poorer prognosis overall, with lower rates of symptom relief and survival, particularly after stenting.<sup>4</sup> Furthermore, intraluminal tumor can increase the risk of tumor thrombus becoming embedded within the stent.<sup>5</sup> Reocclusion of the stented portion due to tumor ingrowth has also been described.<sup>5,6</sup> For patients with recurrent or persistent superior vena cava obstruction, data support the use of stenting.<sup>7</sup> If there are life-threatening symptoms, including stridor due to laryngeal edema, confusion or coma due to cerebral edema, or significant hemodynamic compromise, relief can also be achieved more rapidly with the use of stenting.<sup>8</sup>

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**Figure 1.** Contrast-enhanced computed tomography scan of the thorax reveals bulky right paratracheal adenopathy with direct invasion into the superior vena cava and intraluminal tumor growth (*arrow*) in the (A) coronal, (B) sagittal, and (C) axial planes.

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