

Superior Vena Caval Resection in Lung Cancer



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KEYWORDS

• Lung cancer • Superior vena cava • Caval invasion • Caval resection • Caval reconstruction

KEY POINTS

- Superior vena caval (SVC) invasion has been downstaged to reflect potential resectability with the most recent staging classification.
- Patterns of involvement include central tumor or metastatic mediastinal lymph nodes.
- En bloc resection may require tangential or complete SVC resection.
- Reconstruction may entail simple suture repair or a prosthesis.
- Five-year survival rates can reach up to 30%.

INTRODUCTION

Lung cancer is the leading cause of cancer death worldwide. Surgical resection remains the mainstay of treatment of early-stage disease. Involvement of the superior vena cava (SVC) in lung carcinoma has traditionally been considered a contraindication for surgical resection. These patients have historically been classified as stage IIIB disease, with a 5-year survival of up to 8%.¹

BACKGROUND

Over the past 30 years, reports in the literature have challenged this notion. Patients undergoing SVC resection with reconstruction in the setting of lung cancer have reported 5-year survival rates up to 30% (Table 1). Therefore, the most recent iteration of the staging system has taken this into account and has transferred T4N0–1M0 tumors into stage IIIA disease.

Superior vena cava involvement encompasses a spectrum of diseases. The SVC can be involved through either direct invasion of central tumors (T4 disease) or invasion of metastatic lymph nodes

(N2 disease). In addition, it can be involved in isolation or in conjunction with other mediastinal structures. Patients may present with SVC syndrome.

PREOPERATIVE EVALUATION

Comprehensive preoperative evaluation is imperative in determining whether a patient is an appropriate surgical candidate. A concerted effort should be made to determine whether N2 disease is present through diagnostic imaging and possibly diagnostic biopsies. Sites of distant disease preclude surgical resection. Preoperative pulmonary function testing is essential, because resection may necessitate pneumonectomy. In addition, the phrenic nerve is often sacrificed with complete SVC resection; thus, bilateral phrenic nerve involvement is a contraindication to resection.

THERAPEUTIC OPTIONS AND/OR SURGICAL TECHNIQUES

The surgical approach is based on surgeon preference. Most resections can be performed via a standard posterolateral thoracotomy, but other

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Table 1
Results of SVC resection and reconstruction in the setting of lung cancer from selected case series

Author	Patients	Morbidity (%)	Mortality (%)	Median Survival	5-Year Survival (%)
Lanuti et al, ⁸ 2009	9			21.4 mo	31.0
Suzuki et al, ⁷ 2004	40	40.0	10.0		24.0
Shargall et al, ⁶ 2004	15		14.0	40.0 mo	57.0 (3-y)
Sekine et al, ⁹ 2010	9				18.8
Thomas et al, ¹⁰ 1994	15	20.0	7.0	8.5 mo	24.0
Yildizeli et al, ⁵ 2008	39	10.3	7.7	19.0 mo	29.4
Misthos et al, ¹¹ 2007	9		0	31.0 mo	11.0
Spaggiari et al, ¹² 2004	109	30.0	12.0	11.0 mo	21.0

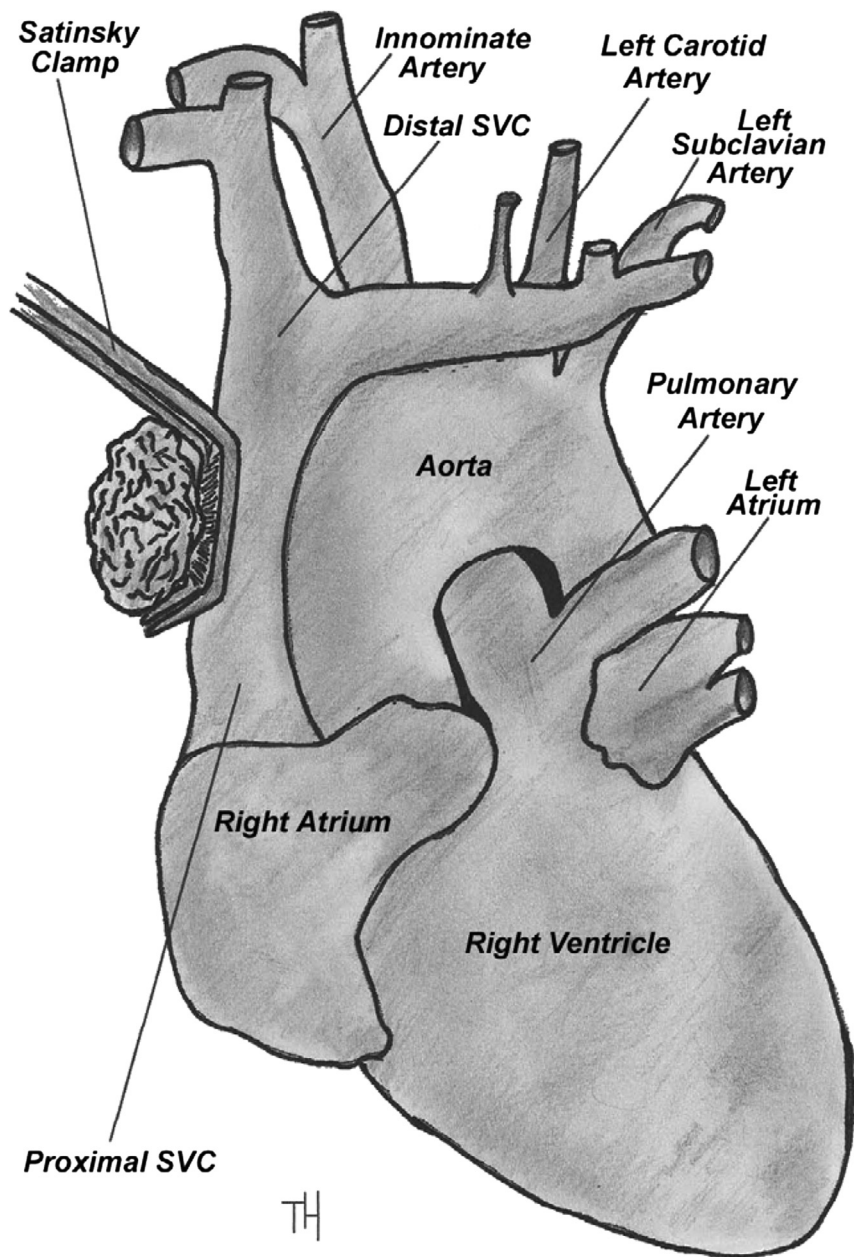


Fig. 1. A partial occlusion clamp is placed over a small tumor invading the SVC for vascular control. (From García A, Flores RM. Surgical management of tumors invading the superior vena cava. *Ann Thorac Surg* 2008;85:2144; with permission.)

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