

L'esperienza nel trattamento delle
complicanze del paziente con
neoplasie polmonari nella rete
oncologica del Piemonte e della
Valle d'Aosta

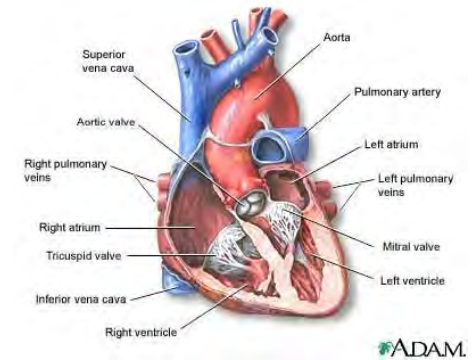
Superior Vena Cava Syndrome

Cristina Mantovani

Superior Vena Cava Syndrome

Definition

Obstruction of blood flow in the superior vena cava results in signs and symptoms of SVC syndrome



Superior Vena Cava Syndrome

Etiology

- Caused by either invasion or external compression of the SVC by contiguous pathologic process
- Right lung pathology, lymph nodes, other mediastinal structures, or thrombosis
- Before antibiotics the most common causes were from complications of untreated infection
 - Syphilitic thoracic aneurysms
 - fibrosing mediastinitis
- Malignancy is presently the most common cause

Etiology: Malignancy

- Lung cancer is the most common
- Lymphoma is second most common
- together represent 94% of cases

Other cancers

- Thymoma
- Primary mediastinal germ cell neoplasm
- Solid tumors with mediastinal nodal metastases
 - breast cancer most common type

NSCLC

- 2-4% of bronchogenic cancer patients develop SVC syndrome
- extrinsic compression or direct invasion
 - primary tumor or by enlarging mediastinal nodes

Small Cell Lung Cancer

- Greatest risk; 20% will develop SVC obstruction
- more common because SCLC tends to occur centrally in contrast to other types

Other causes

- Thrombosis
- Indwelling central venous catheters
- Subcutaneous tunneled catheters have fewer thrombotic and infectious complications

Superior Vena Cava Syndrome

Symptoms and signs

- As the obstruction develops venous collaterals are formed
- Symptom onset depends on speed of SVC obstruction onset
 - Malignant disease can arise in weeks to months
 - Not enough time to develop collaterals
 - Fibrosing mediastinitis can take years to have symptoms
- Central venous pressures remain high even in collaterals
 - High pressures cause the characteristic clinical picture

Superior Vena Cava Syndrome

Symptoms and signs

- Facial swelling or head fullness
 - exacerbated by bending forward or lying down
- Shortness of breath
- Cough
- Arm edema
- Cyanosis
- Venous distension (neck-chest wall)
- Pemberton's Sign



Superior Vena Cava Syndrome

Diagnosis

- Timely identification of the cause is essential
- Radiographic studies are useful
- Up to 60% of patients with SVC syndrome related to neoplasm do not have a known diagnosis of cancer
 - Need a tissue biopsy for histologic studies

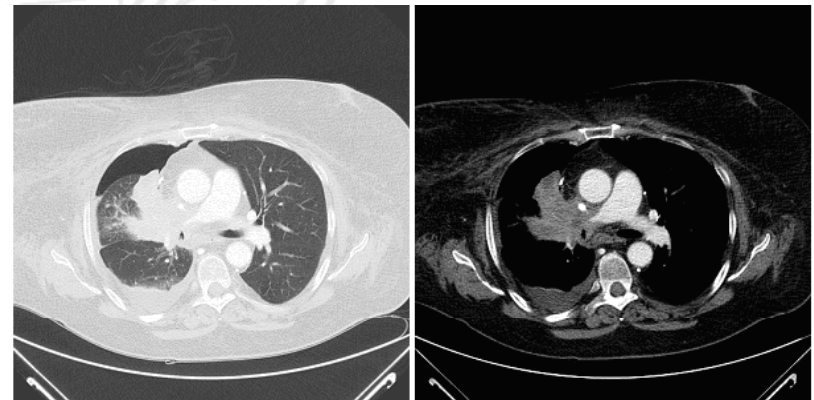
Radiographic Studies

A large, faint, circular watermark of the University of Torino seal is centered in the background. The seal features an eagle with spread wings perched on a shield, surrounded by the Latin text 'SIGILLUM UNIVERSITATIS AVGVSTAE TORINENSIS'.

- Most patients have an abnormal chest x-ray at presentation
- Most common findings are
 - Mediastinal widening
 - Pleural effusion

CT Chest

- Preferred choice
- IV contrast
 - defines the level of obstruction
 - Maps out collateral pathways
 - Can identify underlying cause of obstruction



Histologic Diagnosis

- Essential
- Guides treatment
- Aids in defining prognosis
- Sputum cytology, pleural fluid cytology, biopsy of enlarged peripheral nodes
- Bone marrow biopsy for NHL
- Bronchoscopy, mediastinoscopy, or thoracotomy are more invasive but sometimes necessary

Superior Vena Cava Syndrome

Treatment of Oncologic Causes

Aimed at underlying cause

Superior Vena Cava Syndrome

Treatment of Oncologic Causes

Historically SVC syndrome was considered a potentially life-threatening emergency



Standard of care was immediate radiotherapy

The emergent approach is not appropriate for most patients

Emergent to Urgent

- Symptomatic obstruction is usually a prolonged process
- Most patients are not in immediate danger at presentation
- Most have time for a full diagnostic work up
- Current strategies aim at accurate diagnosis of underlying etiology before therapy

Exception to new rule

- Stridor
 - Central airway obstruction or laryngeal edema
- True medical emergency
- Immediate action needed
 - Possible intubation
 - Immediate therapy to target obstruction needed

Superior Vena Cava Syndrome

Prognosis....

.....Linked to tumor histology and stage at presentation

Superior Vena Cava Syndrome Therapy

- Elevation of the head of the bed
- Anti-edema drugs administered per os or e.v.
 - high doses of steroids (prednisone or dexamethasone) with or without osmotic drugs (mannitol) and diuretics (furosemide), even though an unanimous agreement does not exist on how to use these drugs, the ideal dosage and the best way of giving them.
- Stent placement through femoral venous puncture causes an immediate improvement of clinical symptoms and a quick restoration of respiratory function although nowadays it is not extremely widespread in clinical practice, above all in the cases of neoplastic origins.

Superior Vena Cava Syndrome

Intraluminal Stents

- Endovascular placement under fluoroscopy
- Patients who have recurrent disease in previously irradiated fields
- Tumors refractory chemotherapy
- Patient too ill to tolerate radiation or chemotherapy
- Some data suggests benefit from immediate stent placement in NSCLC at presentation
- Tends to provide more rapid relief of symptoms
- Issue of anticoagulation after is not resolved

Superior Vena Cava Syndrome

Treatment Sensitive Tumors

- NHLs, germ cells, and limited-stage small cell lung cancers usually respond to chemotherapy and or radiation
- Can achieve long term remission with tumor specific directed therapy
- Symptomatic improvement usually takes 1-2 weeks after start of therapy

Effectiveness of chemotherapy and radiotherapy

- In SCLC, the objective response rate to chemotherapy was 68.4%, similar to response rates seen in SCLC in general.
- In NSCLC in general, objective response rates with chemotherapy are much lower than in SCLC (20-40% compared with 50-80%).
It is of interest that rates of relief of SVCO were very similar for chemotherapy and for radiotherapy in both cell types; 76.9% and 77.6% respectively in SCLC and 59.0% and 63.0% in NSCLC.
- This indicates that between these modalities, it would be reasonable to determine treatment on the basis of stage and PS as for patients without SVCO.

Radiotherapy in SVCO

- To begin when the patient's condition is stable
- Radiotherapy doses ranging from 30 Gy in 3 Gy fractions to 50 Gy in 2.5 Gy fractions, depending on the condition of the patients and tumour histology
- 3D conformal techniques with opposed AP-PA fields

Palliative thoracic radiotherapy

- Effective for improvement of symptoms resulting from intrathoracic disease, such as hemoptysis, cough, chest pain, dyspnea and airway obstruction, regardless of extrathoracic disease extension
- Improvement of global QoL in approximately one third of patients
- Although the use of palliative chemotherapy is increasing, RT alone can provide more timely palliation without the morbidity of chemotherapy, and may be the primary or only treatment option for poor-PS patients, or patients who have declined or progressed despite systemic therapy



Palliative Treatment

Radical

Short Term

Prophylactic

“Radical” Palliation

**More protracted, higher overall
dose/fraction schedules for more durable
symptom relief**

Short Term Palliation

**Short, usually high dose/fraction
schedules to produce rapid and effective
relief of symptoms with minimal
morbidity**

Palliative Thoracic Radiotherapy for Lung Cancer: A Systematic Review

*Alysa Fairchild, Kristin Harris, Elizabeth Barnes, Rebecca Wong, Stephen Lutz, Andrea Bezjak, Patrick Cheung,
and Edward Chow*

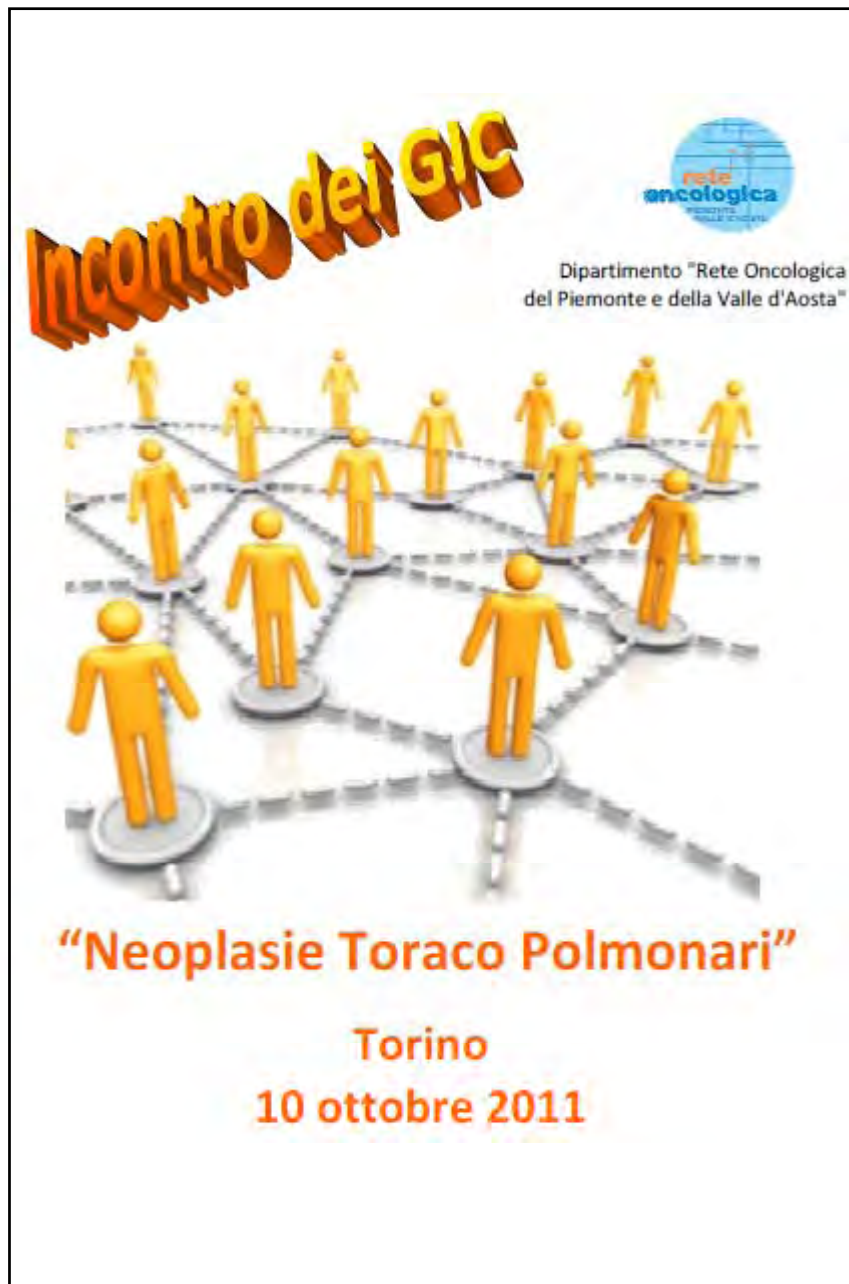
- ✓ First report of quantitative pooling of RCTs comparing different dose fractionation schedules of palliative thoracic RT for locally advanced lung cancer
- ✓ Evidence of equivalency of specific symptom palliation outcome, but statistically significant improvement of Total Symptoms Score and overall survival with higher doses of palliative thoracic RT compared to lower doses (with higher incidence of esophagitis)
- ✓ Patients with intrathoracic symptoms and a short expected survival may achieve a high rate of symptom relief with minimal toxicity and inconvenience with a short course of palliative thoracic radiotherapy

Palliative Thoracic Radiotherapy for Lung Cancer: A Systematic Review

Alysa Fairchild, Kristin Harris, Elizabeth Barnes, Rebecca Wong, Stephen Lutz, Andrea Bezjak, Patrick Cheung, and Edward Chow

Table 1. Dose/Fractionation Schemas

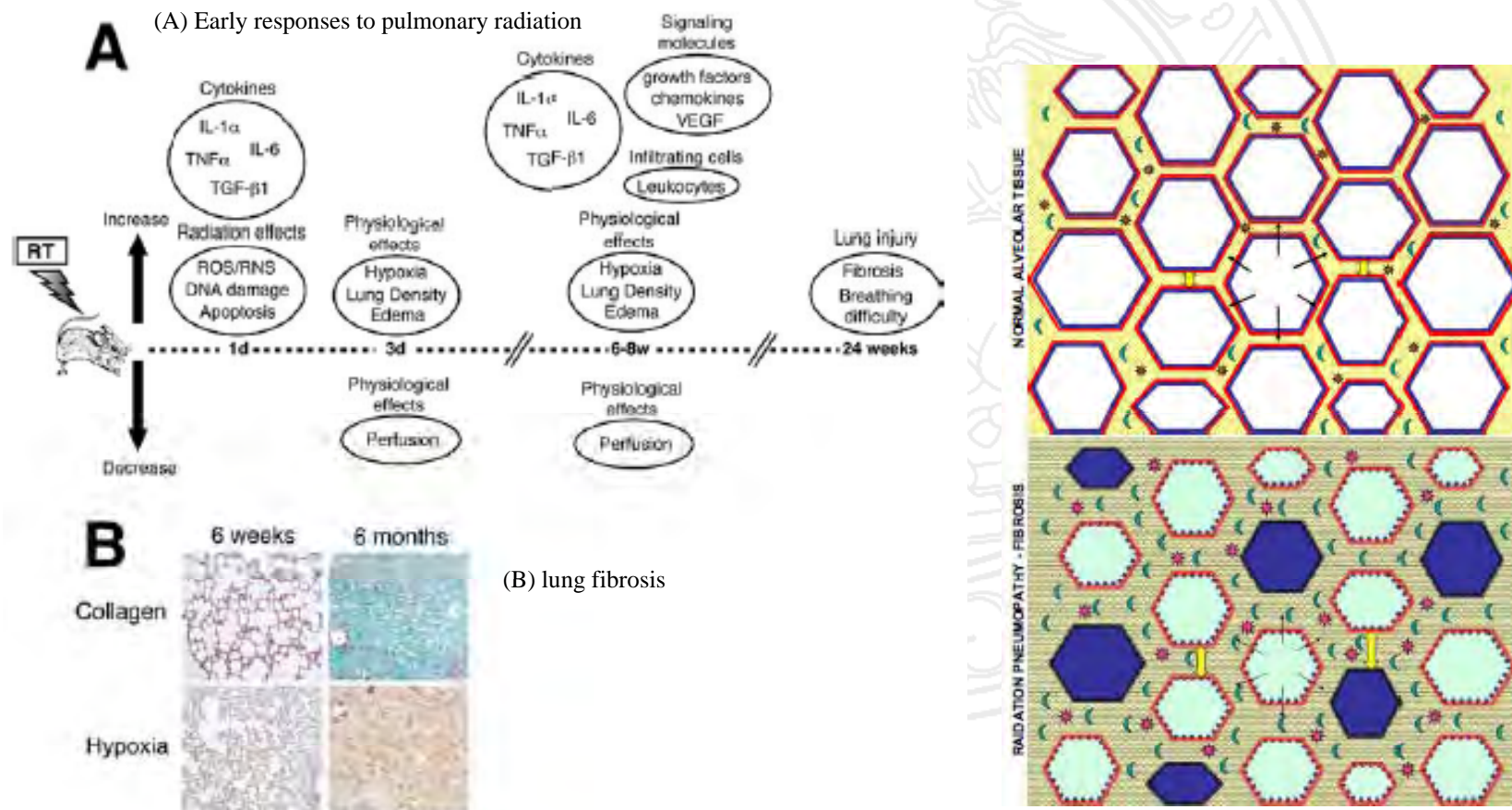
Trial	Year	No. of Patients	Lower-Dose Arm				Higher-Dose Arm			
			Gy	No. of Fractions	Duration	BED (Gy ₁₀)	Gy	No. of Fractions	Duration	BED (Gy ₁₀)
Simpson et al ⁸	1985	409	30	10	2 weeks	35.0	40	8	4 weeks	45.0
Teo et al ⁹	1988	291	31.2	4	4 weeks	43.7	45	18	4.5 weeks	42.8
MRC 1991 ¹⁰	1991	374	17	2	8 days	30.7	30	10	2 weeks†	35.0
MRC 1992 ¹¹	1992	235	10	1	1 day	24.8	17	2	8 days	30.7
Abratt et al ¹²	1995	84	35	10	2.5 weeks	40.1	45	15	4 weeks	45.0
MRC 1996 ¹³	1996	509	17	2	8 days	30.7	39	13	2.5 weeks§	42.8
Rees et al ¹⁴	1997	216	17	2	8 days	30.7	22.5	5	1 week	34.2
Nestle et al ¹⁵	2000	152	32	16 BID	10 days	36.0	60	30	6 weeks	45.9
Bezjak et al ¹⁶	2002	230	10	1	1 day	24.8	20	5	1 week	29.6
Sundström et al ¹⁷	2004	421	17	2	8 days	30.7	50	25	5 weeks	39.4
Erridge et al ¹⁸	2008	149	10	1	1 day	24.8	30	10	2 weeks	35.0
Kramer et al ¹⁹	2005	303	16	2	8 days¶	28.0	30	10	2 weeks¶	35.0
Senkus-Konefka et al ²⁰	2005	100	16	2	8 days	28.0	20	5	1 week	29.6



L'esperienza nel trattamento delle
complicanze del paziente con
neoplasie polmonari nella rete
oncologica del Piemonte e della
Valle d'Aosta

Radiation Pulmonary Toxicity: radiation pneumonitis and fibrosis

Schematic representation of radiation pneumopathy



Treatment of established RILI

- Corticosteroids form the mainstay of therapy

Recommended dose 60-100 mg daily for 2 weeks followed by a gradual taper over 3 to 12 weeks

Prophylactic administration of corticosteroids doesn't appear to be beneficial

- Pentoxifylline and/or vit E and hyperbaric oxygen: no clear benefit in established radiation fibrosis

Estimating need for palliative RT in adult cancer patients

- Older surveys and benchmark data from different sources have suggested that 46–53% of all radiotherapy courses were administered with palliative intent
- Prospective data on the use of palliative radiotherapy during a 12-month period between 2007 and 2008 were collected in one Norwegian County
- The annual number of target volumes amounted to 175 per 100,000 inhabitants
- The need for palliative radiotherapy has not decreased and might be greater than previously estimated
- Apparently, the introduction of new systemic cancer therapies has not resulted in a reduced need for palliative RT; on the contrary, the increasing life span of patients with metastatic cancer, resulting from improved systemic treatment, has resulted in increasing numbers of patients who need palliative RT at one or more points in time

Carsten Nieder, IJROBP, 76,1, 207-211, 2010

Some Factors in Over Treatment of Patients with Advanced Cancer

- Inexperience
- Inappropriate expectations
- ✓ Patient
- ✓ Physician
- Pressure from relatives/ colleagues
- “Give hope”
- Inadequate communication
- Departmental policy