

SIOP PODC Supportive Care Education (ICON 2016)

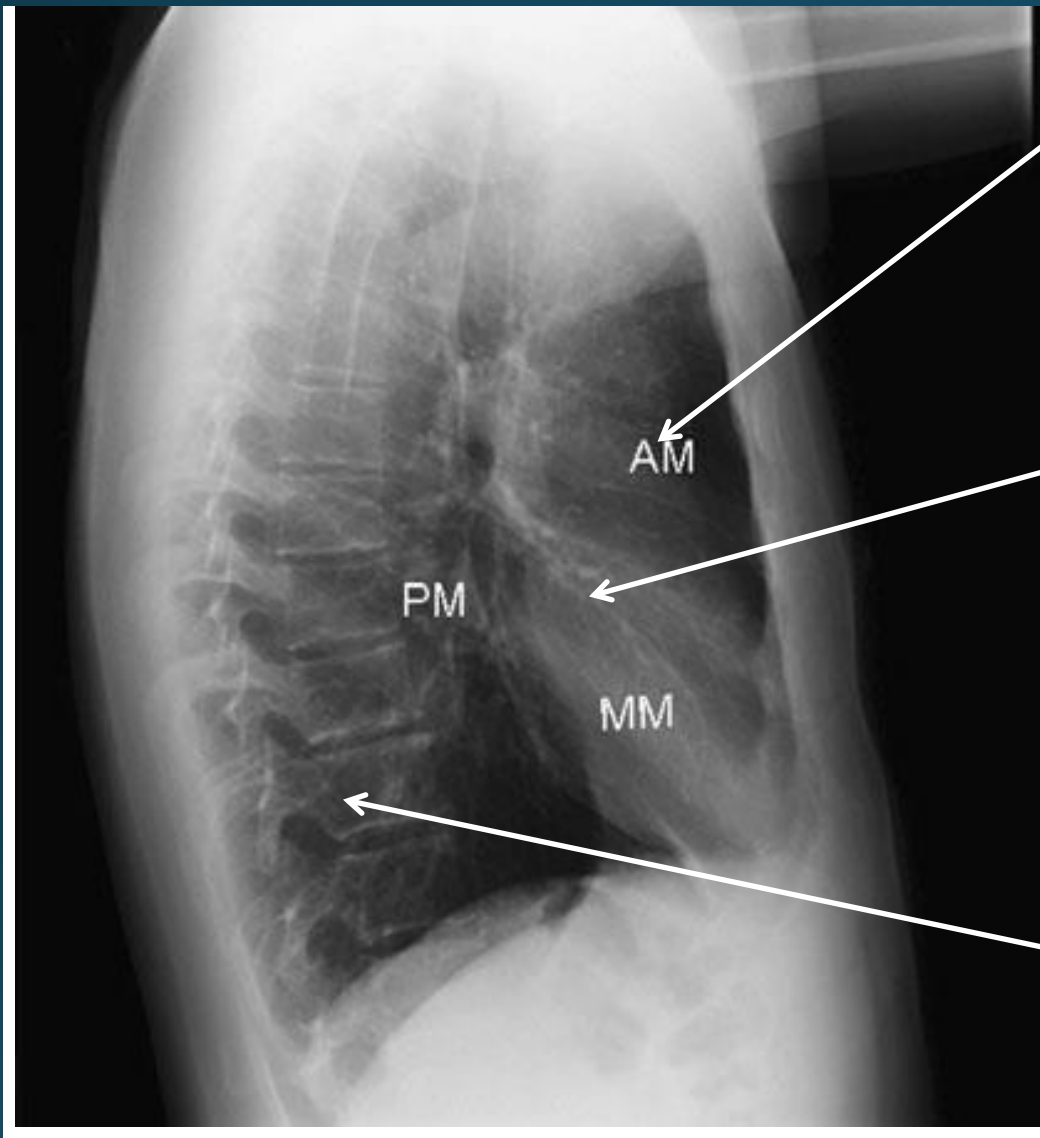
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Mediastinal Mass

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Anterior Mediastinum

a **prevascular compartment**, including all structures anterior to the pericardium and proximal ascending aorta;

Middle Mediastinum

a **visceral compartment**, including all major mediastinal visceral structures extending from anterior pericardium posteriorly to a vertical line drawn 1 cm posterior to the anterior margin of the spine (both the trachea and the esophagus are therefore included in this middle mediastinal compartment);

Posterior Mediastinum

and a **paravertebral compartment**, including all mediastinal structures posterior to this vertical line.

Table 1
Mediastinal masses by compartment^a

Anterior Mediastinum or Prevascular Compartment ^a	Middle Mediastinum or Visceral Compartment	Posterior Mediastinum or Paravertebral Compartment
Lymphadenopathy	Lymphadenopathy	Lymphadenopathy
Thyroid and parathyroid lesions	Thyroid lesions	—
—	Ascending aortic aneurysm Aortic arch aneurysm Dilated main pulmonary artery Aberrant right/left subclavian artery Descending aortic aneurysm	Descending aortic aneurysm
Thymic lesions (cyst, hyperplasia, thymic neoplasm, including lymphoma)	—	—
—	Paranglioma and other neurogenic tumors	Neurogenic tumors including neurofibroma, schwannoma, paraganglioma
—	—	Lateral meningocele
Germ cell tumors	—	—
—	Pancreatic pseudocyst	Pancreatic pseudocyst
Pleuropericardial or mesothelial ^b cysts	Mesothelial cysts	Mesothelial cysts
—	—	Extramedullary hematopoiesis
—	Tracheal lesions	—
—	Esophageal lesions	—
Morgagni hernia	Hiatal hernia	Bochdalek hernia
Bronchogenic cysts (very rarely)	Foregut duplication cysts	Foregut duplication cysts
Abscess	Abscess	Abscess
Hematoma	Hematoma	Hematoma
Fibrosing mediastinitis	Fibrosing mediastinitis	Fibrosing mediastinitis
Hemangioma	Hemangioma	Hemangioma
Lymphangioma	Lymphangioma	Lymphangioma
Sarcoma	Sarcoma	Sarcoma

N=172		
Lymphoma		74%
	NHL	58%
	HL	42%
ALL		7%
Thymoma		2.3%
Histiocytosis		1.7%
Neuroblastoma		2.9%
Germ cell tumor		2.3%
Teratoma		2.3%
Other		7.5%

Acker et al. *J Pediatr Surg*; 50: 2015. Garey et al. *Eur J Pediatr Surg*; 21: 2011.
Mushtaq et al. *J Pak Med Assoc*; 64: 2014. Stricker et al. *J Clin Anesth*; 22:2010.

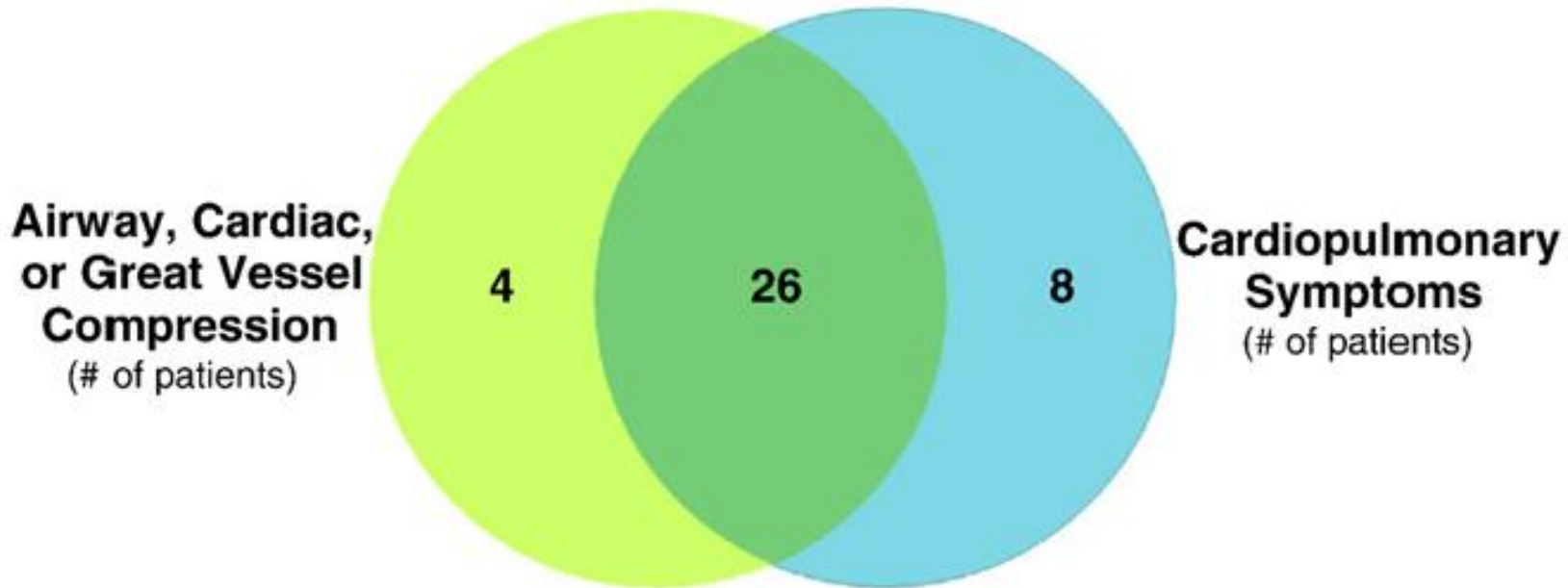
Signs and symptoms

- Shortness of breath 56%
- Cough 51%
- Orthopnea 33%
- SVC Syndrome 32%
- Asymptomatic 26%

Table 1 Presenting signs and symptoms of children with critical airway and anterior mediastinal mass

Symptoms/signs	No. of patients
Orthopnea	22
Dyspnea	22
Cough	19
Pleural effusion	15
Wheezing	8
Superior vena cava syndrome	7
Pain (pleuritic, chest, neck, back)	7
Stridor	4
Impending respiratory failure	3
Vomiting exacerbated by supine position	1

Perger et al. *J Pediatr Surg*; 43: 2008.



Relationship between radiologic evidence of cardiorespiratory compression and the preoperative signs and symptoms suggestive of mass effect.

Work-up

History

Dyspnea

Orthopnea

Fatigue

Cough

Sweating

Chest pain

Dysphagia

Syncope

Weight loss/gain

Hoarseness

Work-up

History



Physical Exam

- Signs of cardiorespiratory compromise
 - Tachypnea
 - Stridor/Wheezing
 - Venous engorgement
 - Orthopnea
 - Altered air entry/Pleural effusion
 - Tachycardia/dysrhythmia
- Signs of altered anatomy
 - Tracheal shift
 - Neck mass/adenopathy
 - Hepatosplenomegaly
 - Chest wall masses/abnormalities
 - Cardiac apical shift

Work-up

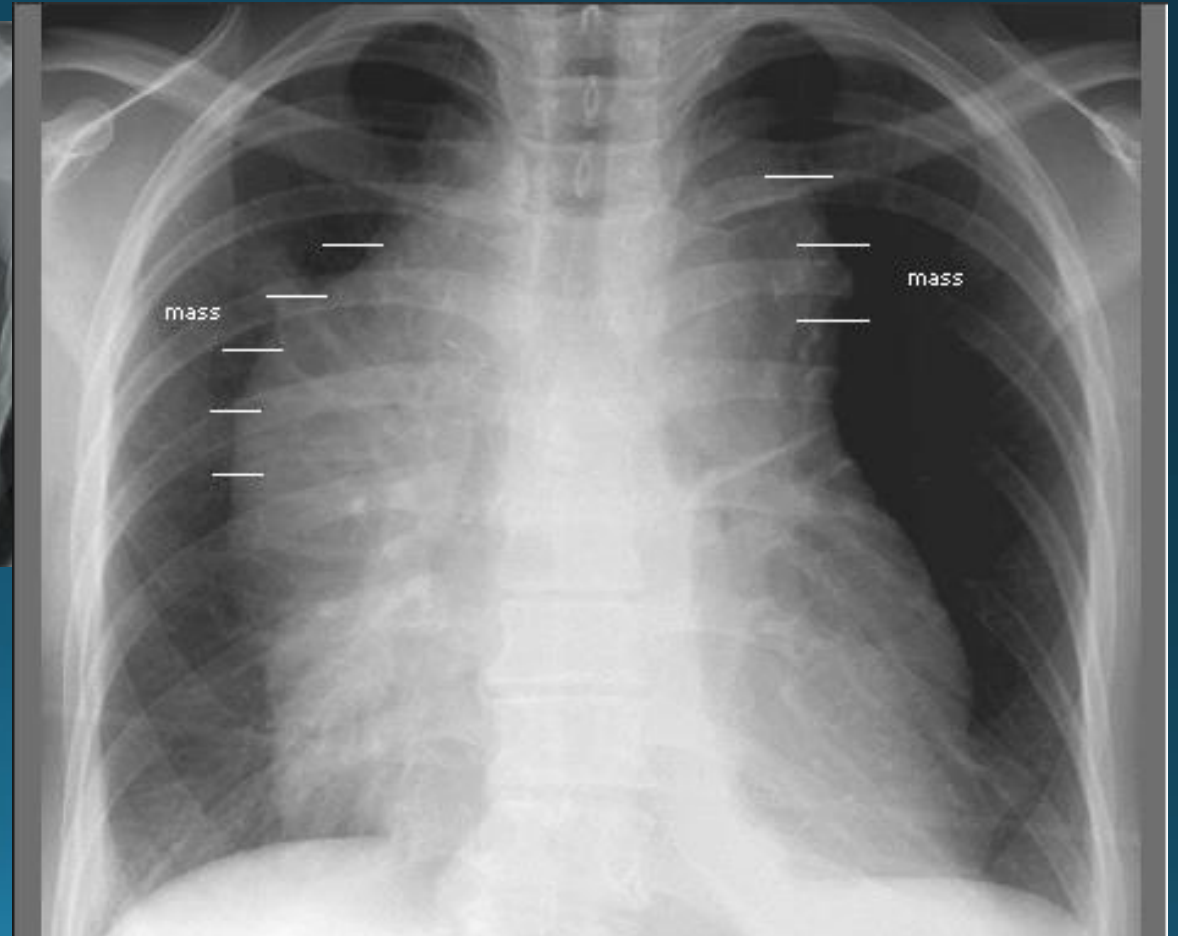
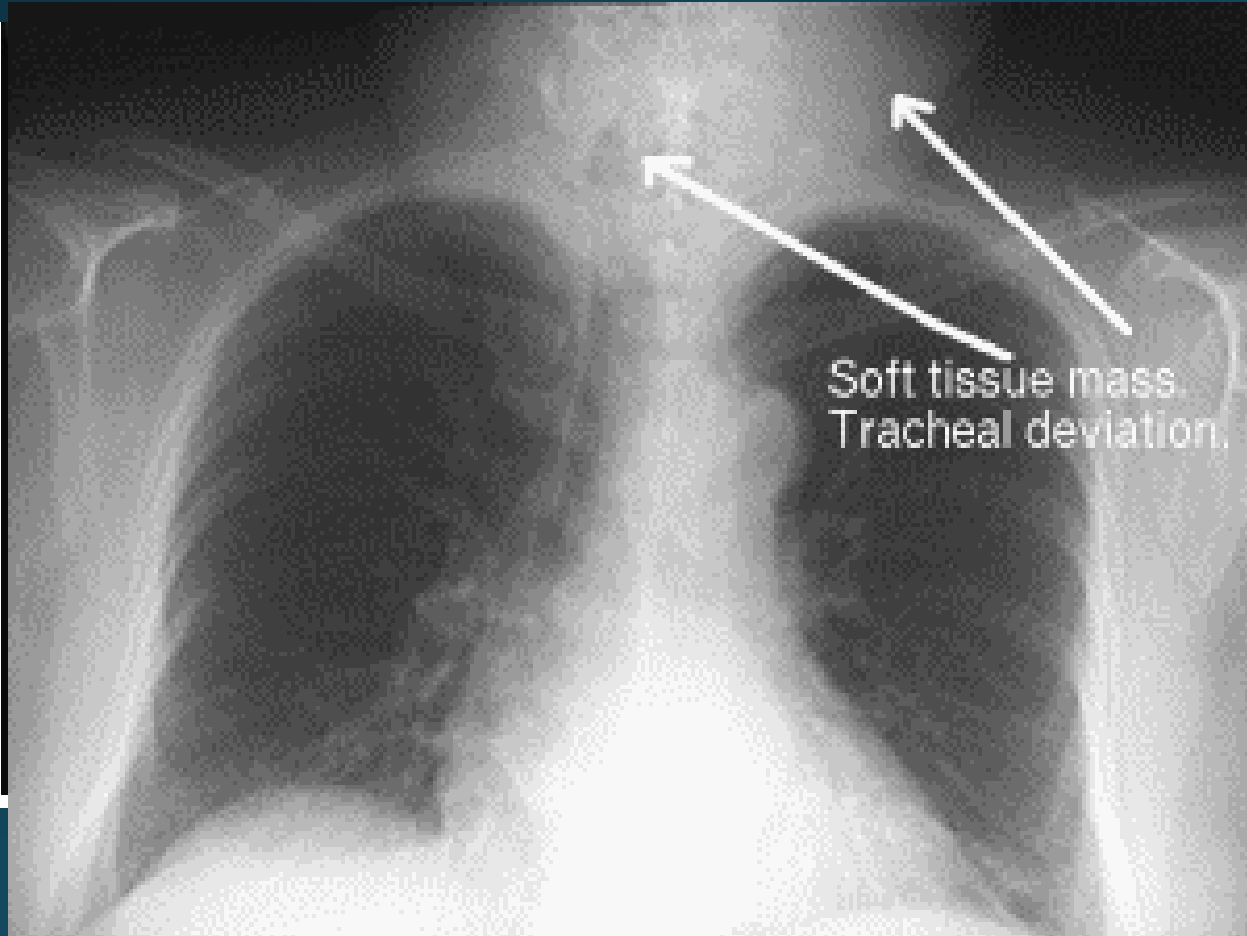
History



Physical Exam



X-ray Chest

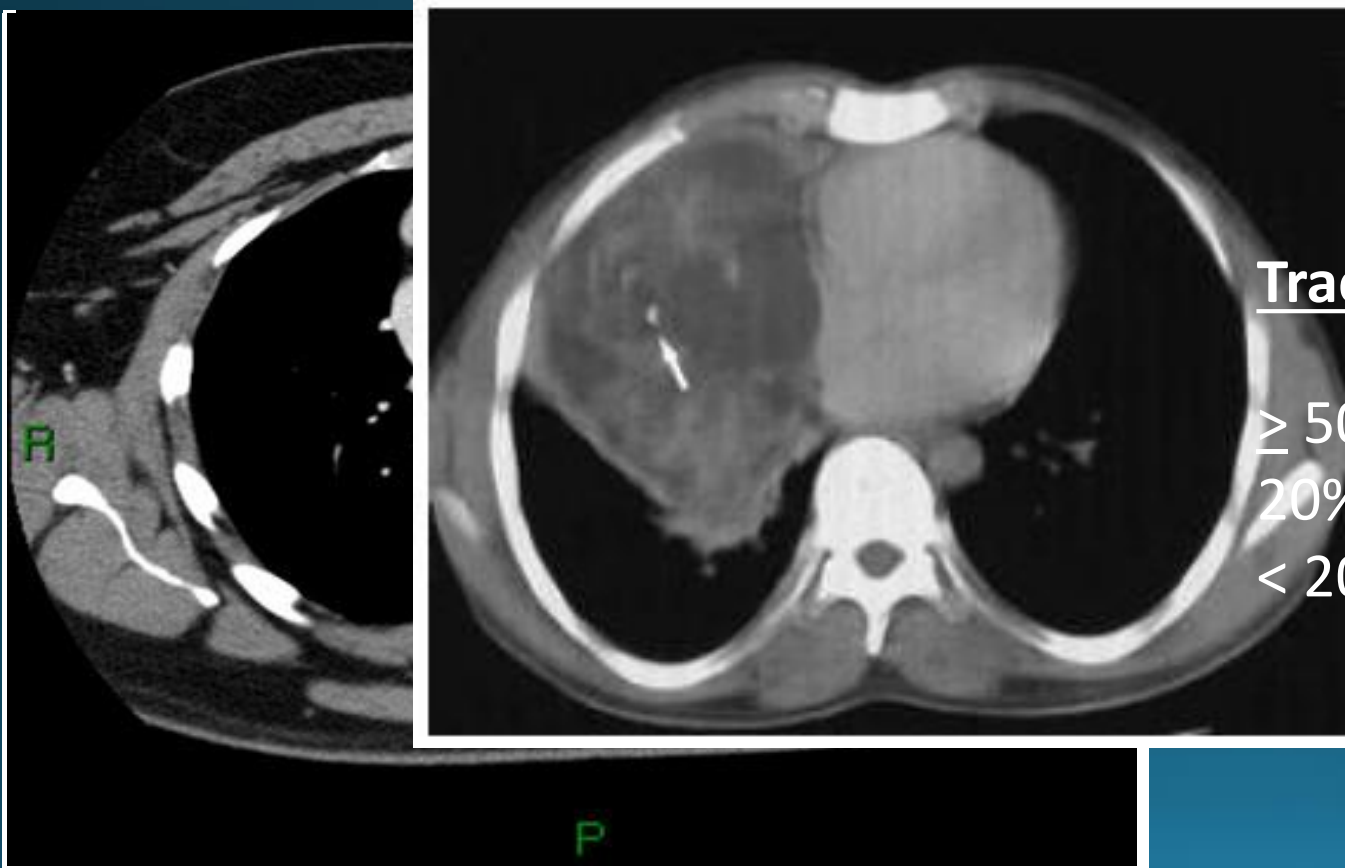


Work-up



- CBC
- Electrolytes
- LDH
- Urinary catecholamines
- α FP/ β HCG
- Blood gases/Pulse oximetry
- EKG/Echocardiogram
- Pulmonary function tests/Peak Expiratory Flow Rate (PEFR)

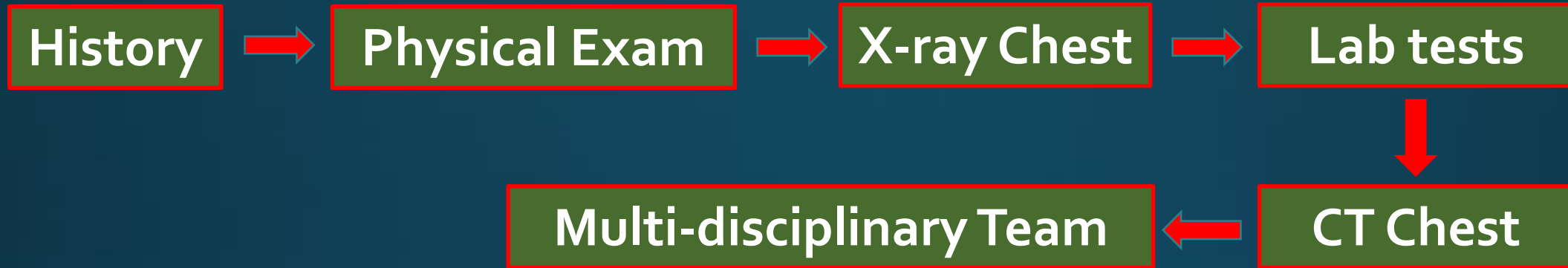
Work-up



Tracheal Cross-Sectional Area (TCA)

$\geq 50\%$	Severe Compression
20% - 50%	Moderate Compression
$< 20\%$	Mild Compression

Work-up



Anesthesia
Surgery
Pathology
Interventional Radiology
Pulmonology
Cardiology

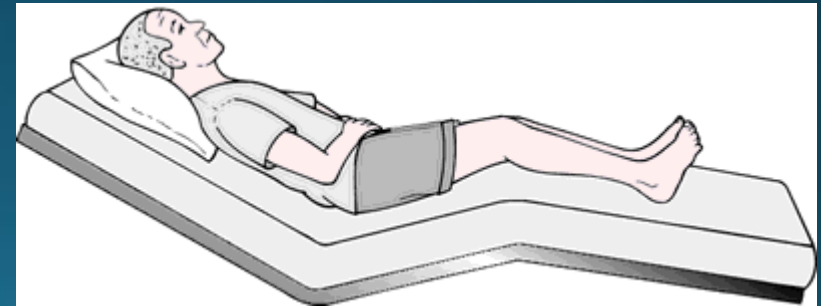
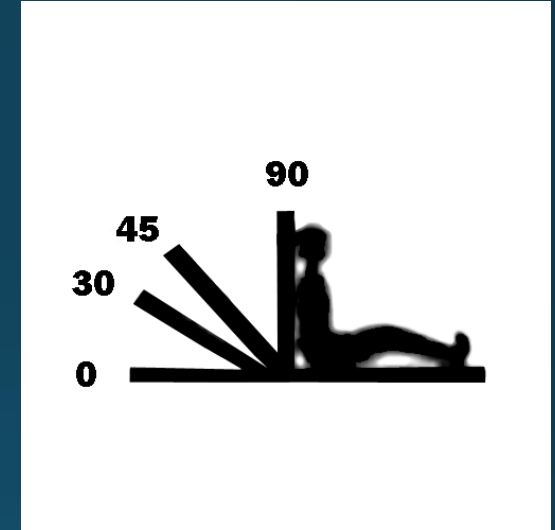
AIM

- Establish a diagnosis
- Relieve cardiorespiratory compromise



Establishing a Diagnosis

- Try to get tissue from outside the thorax
 - Lymph-node biopsy
 - Bone marrow
 - Pleural/Ascitic fluid
 - Tumor markers
- Try to do the procedure with local anesthesia
 - Sitting/Fowler/Semi-Fowler position



Establishing a Diagnosis

- Careful assessment of anesthesia needs

- Avoid deep sedation/anesthesia
- Avoid muscle relaxants
- Evaluation of airway risk
- Evaluation of hemodynamic risk

LOW RISK: Asymptomatic or mildly symptomatic, without postural symptoms or radiographic evidence of significant compression of structures;

INTERMEDIATE RISK: Mild to moderate postural symptoms, tracheal compression $<50\%$;

HIGH RISK: Severe postural symptoms, stridor, cyanosis, tracheal compression $>50\%$ or tracheal compression with associated bronchial compression, pericardial effusion or SVC syndrome.

- Combination of left mainstem bronchial compression and right pulmonary artery compression can cause complete V-P mismatch
- Compression of the SVC, pulmonary arteries, or the heart can result in diminished cardiac output
- Anterior compression of the heart involves the right ventricle and the outflow tract, whereas the left heart is compressed posteriorly
- Direct myocardial compression may result in a tamponade-like syndrome

Procedural Catastrophes

- Carinal/Main Bronchial collapse
 - Rigid bronchoscopy
 - Main bronchus intubation
- Extra-corporeal Oxygenation/Bypass
 - Pre-anesthesia preparation
 - Insertion of double lumen femoral line under local anesthesia

Emergency Mediastinal Mass Reduction

- Steroids
- Radiation
 - May result in a lack of tissue diagnosis
- Surgical resection

Conclusions

- Detailed assessment
 - Multi-disciplinary approach
 - Use safest diagnostic procedure
 - Plan for the worst
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- Speed is critical