CV 1 Blunt chest trauma with suspected thoracic cardiovascular injury

Blunt chest trauma with suspected thoracic cardiovascular injury

- Abnormal CXR or clinically high probability of significant thoracic trauma
  - CT thorax +/- CT angiography
    1. To detect mediastinal haematoma or other causes of widened mediastinum
    2. To detect vascular injury and site
  - Aortic injury suspected or confirmed
    - Urgent surgery / endovascular intervention
  - Aortic injury excluded
    - Clinical follow-up

- Normal CXR and low probability of significant thoracic trauma (normal mental status, normal clinical examination)
  - Change in condition

- Resuscitation +/- surgical intervention if haemodynamically unstable

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REMARKS

1 Plain radiograph
   1.1 Remains the primary screening modality despite the advent of newer imaging modalities.
   1.2 7 – 11% of patients with aortic rupture have an initial normal chest X-ray (CXR).
   1.3 Most common finding on CXR is widening of mediastinum (90% sensitivity but only 10% specificity for aortic injury).
   1.4 Radiographic signs of blunt thoracic aortic injury:
       1.4.1 Widened mediastinum (defined as transverse dimension ≥ 8cm from the left side of the aortic arch to the right margin of the mediastinum or mediastinum to chest-width ratio ≥ 25%)
       1.4.2 Loss of the aortopulmonary window or loss of definition of the descending thoracic aorta
       1.4.3 Widened right paratracheal stripe or paraspinal stripe
       1.4.4 Tracheal shift to the right of the T4 spinous process
       1.4.5 Left main stem bronchus depression
       1.4.6 Nasogastric tube displaced to the right
       1.4.7 Left apical pleural cap sign

2 CT and CT angiography
   2.1 CT has become the reference-standard imaging study for the diagnosis of blunt traumatic aortic injury and has almost completely replaced catheter aortography and transoesophageal echocardiogram (TOE).
   2.2 CT angiogram (CTA) has high sensitivity and specificity in detection of blunt thoracic aortic injury.
   2.3 When initial trauma survey and mechanism of injury suggest a low probability of significant thoracic trauma (normal mental status, normal clinical examination and normal CXR), further assessment with chest CT thorax or CTA may not be necessary.
   2.4 Routine use of CT thorax should be strongly considered in patients with high energy mechanism of injuries, abnormal CXR, altered mental status, distracting injuries, or clinically suspected thoracic aortic injuries.

3 Echocardiogram
   3.1 Transthoracic echocardiogram (TTE) is helpful in suspected cardiac injury and excluding cardiac rupture and acute valvular injury.
   3.2 TOE is more sensitive than TTE but more invasive and usually requires sedation, therefore it is rarely used as an initial evaluation.
   3.3 Limitations include lack availability of cardiologists skilled in performing TEE in the emergency setting; blind spots in distal ascending aorta/arch vessels.

4 MRI
   4.1 MRI does not have a role in initial evaluation of critically ill, haemodynamically unstable patients.
5 Catheter angiography

5.1 Gold standard in evaluating injury to the aorta and its main branches.
5.2 Now largely replaced by CTA for initial assessment and reserved mainly for endovascular intervention in confirmed cases.
5.3 Angiographically confirmed aortic injury is found in only 10 – 20% of patients with mediastinal widening.
REFERENCES