Total Body Survey – Blunt Polytrauma

- 1st - Dry head CT
- Arms over head: 120 IV contrast- bolus timing
- IV enhanced total body scan in one sweep from circle of Willis through pubic symphysis – 18 sec.
- Total body CT saves exposure over segmented scanning
- 40-detectors (0.75 mm profile) (1.5mm for large patient)
- Reconstruct all axials at 3-5 mm – PACS
- Less contrast dose – 120 ml of 350mg% with dual-head injection
- For MPR, MIP, VR use 2 mm section with 50% overlap (TeraRecon – all sections stored)
Comparing injection techniques using iohexol 350

6cc/sec 70cc, 4cc/sec 30cc, 4cc/sec 50cc saline
6cc/sec 50cc, 4cc/sec 50cc, 4cc/sec 50cc saline
4cc/sec 50cc, 2cc/sec 50cc, 2cc/sec 50cc saline

CT Signs of Trauma Aortic Injury

- Mediastinal hemorrhage
- Pseudoaneurysm
- Abrupt diameter or contour change
- Coarctation
- Intimal flaps
- Intraluminal thrombus
- Active bleed
- Small aorta / peridiaphragm crus blood
Patients with aortic injury usually have a markedly abnormal mediastinal contour on radiography. In some cases though the abnormality is very subtle and easily passed as normal. The trend toward increasing reliance on MDCT screening for blunt chest trauma will be of benefit in reliably establishing or excluding the diagnosis of TAI definitively.

CT: Intimal flaps & Pseudoaneurysms
Typical CT Aortic Injury

Typical traumatic aortic injury
Typical Aortic Pseudoaneurysm
Subtle TAI intimal flap

injury
Traumatic Aortic Coarctation

- Pseudoaneurysm or flap occludes lumen
- Decreased distal pulse pressure
- Small abdominal aorta

Small abdominal aorta
Aortic Injury: Coarctation & Small Aorta

Pseudocoarctation - Small Abdominal Aorta
Here come the stents

Stent–graft Repair
Stent Partially Misses PsAn

Stent collapse from leak around periphery
Volumetric Rendering

- All the information in one or a few images
- Fast and easy to generate < 5 min.
- Familiar anatomically to non-radiologist

Atypical Aortic Injuries

- Thrombus – embolization
- Dissection
- Active bleeding
Renal embolic infarcts from aortic thrombus

Emboli from aortic injury
Traumatic aortic dissection
Pitfalls of CT diagnosis

- Atypical injury locations
- Congenital variants (aberrant vessels, ductus, bronchial artery diverticulum)
- Subtle injuries
- Atherosclerotic ulceration
- Chronic pseudoaneurysm

Atypical pseudoaneurysm
Ductus diverticulum

Subtle Aortic Injury
Aortic Injury: Relationship of pseudoaneurysm to branch vessels key

Atypical location
Stab wound to aorta

Non-aortic Vascular Injuries

- Branch vessels
- Internal mammary
- Intercostal
- Large veins
- Heart
- Pulmonary vessels
Left Subclavian Injury
Stab wound:
Occluded Lf. SCA

Dissection / thrombus left common carotid
Branch vessel injuries

Bilateral Scapulothoracic Dissociation
Arch and Lf CC

Active bleeding into chest - blunt
Pleural space bleed
Stab: intercostal

Intercostal artery bleed
“Pseudo” active bleeding s/p angiogram

Bleeding from Lung
Stab wound: Pulmonary artery pseudoaneurysm

Exclude vascular injury
Iatrogenic IMA Pseudoaneurysm

Stab: IMA bleeding
Active anterior mediastinal bleed with tamponade

Anterior mediastinal hematoma with cardiac tamponade
Stab to left ventricle

SVC
Pseudoaneurysm
Thank you