College of Health and Medical Technologies
Department of Radiology Technologies
Computed Tomography

CT scan of facial bone
CT scan of the neck

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LECTUER 6

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MSc Radiographic Imaging

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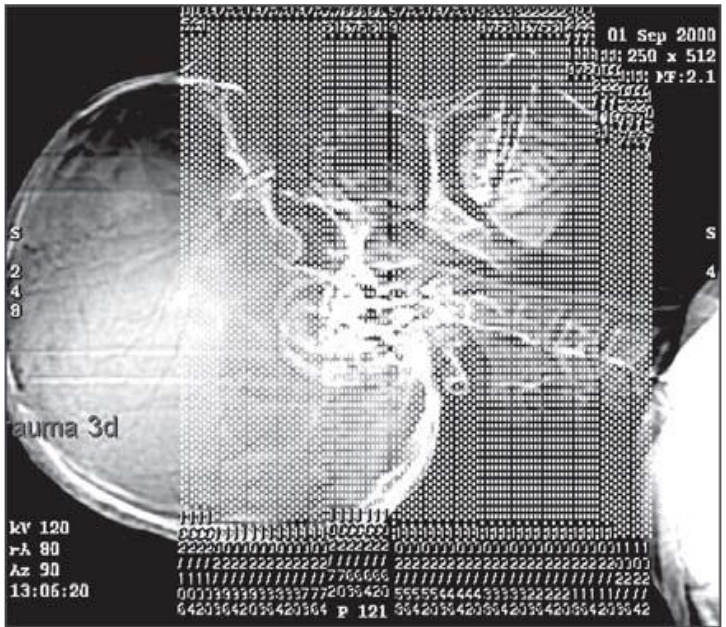
CT scan of facial bone

Indications: Trauma, malformations, malignancies and inflammation.

Preliminary investigations: Appropriate X-ray examination of the face except for isolated evaluation of the sinuses.

Patient preparation: Information about the procedure; restraint from food, but not fluid, is recommended, if intravenous contrast media are to be given.

Scan projection radiograph: Lateral from jaw to vertex.



تصوير عظام الوجه اكزيال

تصوير عظام الوجه كرونال

Image Criteria

• Visualization of entire face from palate to the top of the frontal sinus.

• Vessels after intravenous contrast media.

FOV: Head dimension (about 24 cm).

Gantry tilt: 0 to –10° from OM for axial scanning of the face; according to the patient position for coronal scanning.

X-ray tube voltage (kV): Standard.

Tube current and exposure time product (mAs): Should be as low as consistent with required image quality.

Reconstruction algorithm: High resolution or standard.

Window width: 1500-3000 HU (bones), 140-1000 HU (soft tissue).

Window level: 200-400 HU (bones), 30-100 HU (soft tissue).

Pitfalls: Artifacts from teeth or dental prothesis/ fillings.

Modification to technique: Change of gantry angulation or patient position to avoid artifact.

CT scan of the neck:

indications

1. Inflammatory, nodal and tumoral diseases including lymphoma and metastases.
2. Thyroid diseases
3. Pharyngeal lesions
4. Salivary glands pathologies
5. Detection /confirmation of lesions
6. Follow-ups of Trauma

Contra-indications

1. Hypersensitivity to iodinated contrast media
2. Pregnancy(relative)
3. Renal diseases

Position of the neck:

patient Preparation

1) Clear history should be taken along with reports of previous investigations.
2) Pregnancy needs to be ruled out.
3) Radiopaque materials should be removed from FOV.
4) Proper information and instruction about the procedure.
5) NPO for 4-5 hours prior to procedure for CECT
6) Blood Creatinine levels should be in its normal limit (M=0.6 to 1.5,F=0.5-1.2 mg/dl) and Blood urea level should range between 9 to 42 mg/dl
7) Signed informed consent from patient or his/her close relatives.
8) Irritable/uncooperative and Pediatric patients should be sedated.
9) Neck should be in neutral position.
10) The patient should be instructed to avoid swallowing movements.

routine Neck protocol

Patient positioning : Head first, supine with arms by the sides of the trunk with hands tucked under the hips. Head rest/support can be applied to restrict the neck movement.

Topogram position/Landmark lateral; level of forehead

Mode of scanning : Helical with single breath-hold technique

Scan orientation : Cranio-caudal

Starting location : Base of the skull

End location : Arch of the aorta

Cranio-caudal orientation reduces artifacts at the level of the thoracic inlet caused by the beam-hardening effects of the contrast agent.

FOV : Just fitting the ROI.

routine Neck protocol

Gantry tilt :To make the plane of the scanning parallel to the hard palate or perpendicular to the plane of larynx.

Contrast administration : Intravenous and monophasic

Volume of contrast : 80-100 ml

Rate of injection of contrast :2-3 ml/sec

Scan delay :30-40 sec

Slice thickness in reconstruction : 3-5 mm

Slice interval in reconstruction :1.5-2.5 mm Reconstruction algorithm/kernel Medium smooth for soft tissue. , Sharp for cartilage, bone and lung parenchyma in the scan range. ,3D-Reconstructions , MPR , MIP

Unless contraindicated , IV contrast media is used when scanning the neck.

The goals in CT scanning of the neck are to allow sufficient time after contrast administration for mucosa , lymph nodes , and pathology tissue to enhance , yet acquire images while the vasculature remains opacified .

Scanning too early after the contrast media injection could result in certain types of neoclassic and inflammatory processes going undetected .

However, by delaying scan acquisition , the injected contrast agent will no longer opacify the vasculature . One strategy for addressing these contradictory goals is a split bolus . The total contrast dose is split , ****often in half . The first dose is given and a delay of about 2 minutes is observed . This allows time for structures that are slower to enhance to be opacified.

This allows time for structures that are slower to enhance to be opacified. The delay is followed by a second bolus containing the remainder of the contrast ; scanning is initiated soon after the second injection to more fully opacify the vessels . The split bolus injection technique is also frequently used for maxillofacial studies in which contrast media is indicated

CT Carotid Angiography

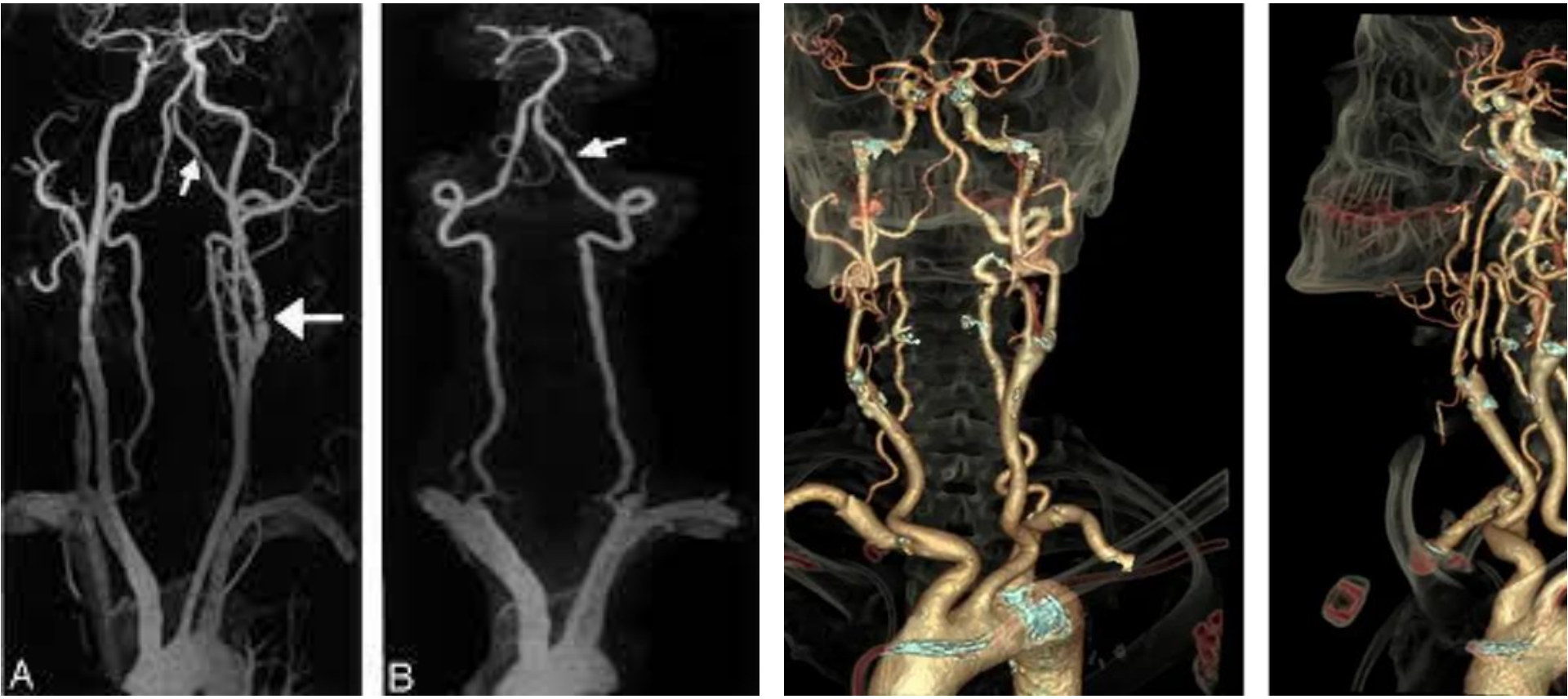
Indications

- Suspected occlusion of the carotid arteries, their aneurisms, dissections.
- Preoperatively for head /neck tumors to detect the origin of their feeding vessels for the purpose of ligation.

Patient positioning :Head first, supine with arms by the sides of the trunk with hands tucked under the hips.

Head rest/support can be applied to restrict the neck movement.

CT Carotid Angiography



Topogram position/Landmark : lateral; level of forehead

Mode of scanning : Helical with single breath-hold technique

Scan orientation : Caudo-Cranial

Starting location : Arch of the aorta : End location , 2-3 cm above the sella

FOV : Just fitting the ROI.

Gantry tilt = Nil

Contrast administration : Intravenous , monophasic Volume of contrast : 100-120 ml

Rate of injection of contrast = 4-5 ml/sec

Scan delay = 10-15 sec

Slice thickness in reconstruction = 1.0-1.5 mm

Slice interval in reconstruction = 0.5-0.75 mm

Reconstruction algorithm/kernel = smooth

3D-Reconstructions = MIP , VRT (preferably after bone subtraction)

.Advantages of MRI over CT

- Multiplanar capability
- Lack of ionizing radiation
- Safer contrast agents
- Better imaging of soft tissues of neck Advantages of CT over MRI
- Superior assessment of osseous integrity
- Shorter examination time
- Wider patient access
- Lower cost

Limitations of CT

1- It is an expensive technique.

2-Very high density restorations as dental restorations produce severe artifacts on the CT scan.

3-High dose of radiation.

4- There is an inherent risk with the use of contrast media.

THANK YOU