Computed Tomography

- SINUSES CT SCAN
- Prepared By: Ahmed Jasem Abass
  MSC Medical Imaging
- BY AHMED JASEM ABASS
- MSC of Medical
- Imaging





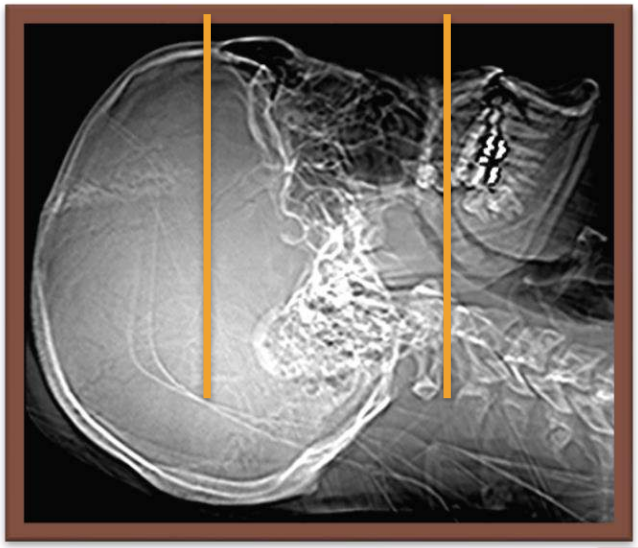
Screening Sinus CT

- CT of the sinuses primarily is used to:

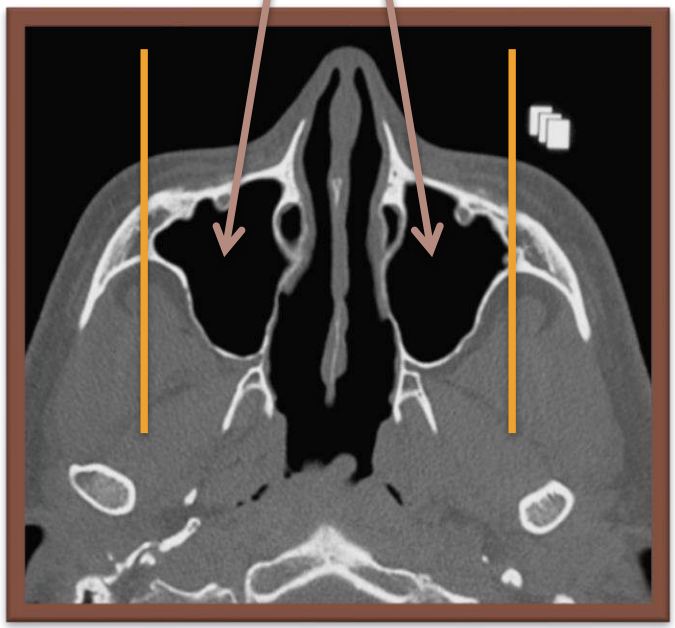
1. Detect the presence of inflammatory diseases.
2. Plan for surgery by defining anatomy or giving further information about tumors of the nasal cavity and sinuses.
3. Evaluate sinuses that are filled with fluid or thickened sinus membranes.
4. Help diagnose sinusitis.

- **Scout image:** Patient is placed supine. The alignment of the scan is perpendicular to the hard palate. The scan is set up to start posterior to the sphenoid sinus and continued anteriorly through the frontal sinuses and anterior face.
- **Contrast:** 100cc Omnipaque 300 IV, R/O sinus or nasal cavity tumor
- **kVp / Effective mAs / Rotation time** (sec) 120 / 130 / 0.75
- **FOV :** 180 mm.
- **Thickness:** 3 mm.
- **Bone Window:** WC : 200, WW : 2000
- **Soft Tissue Window:** WC : 50, WW : 350
- Submit images in bone and soft tissue algorithm, ALL 3 PLANES at 2mm.

Scan Coverage: Maxillary teeth through frontal sinuses



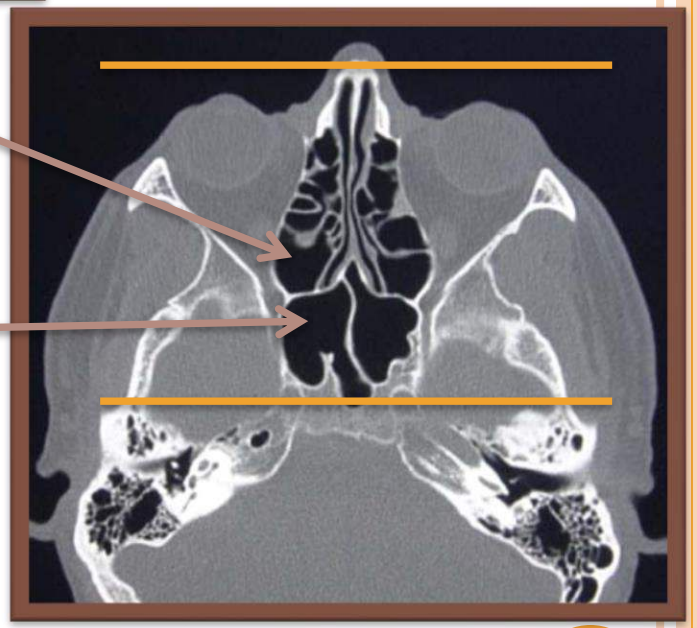
Maxillary Sinus



Sagittal reconstructions (through all sinuses)

Ethmoid Sinus

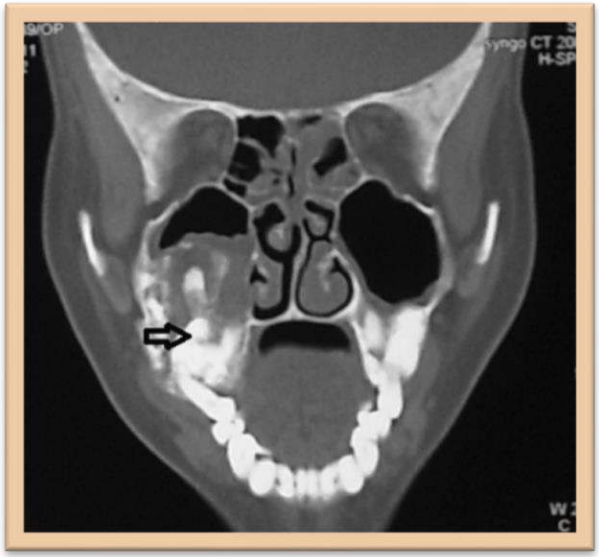
Sphenoid Sinus



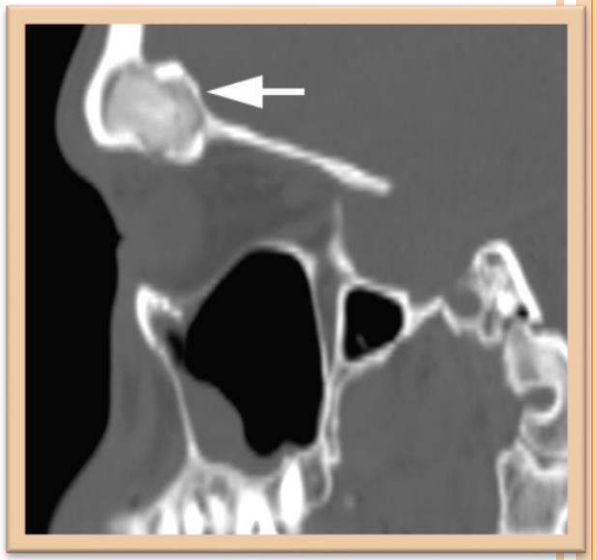
Coronal reconstructions (back of sphenoid sinus through nose)



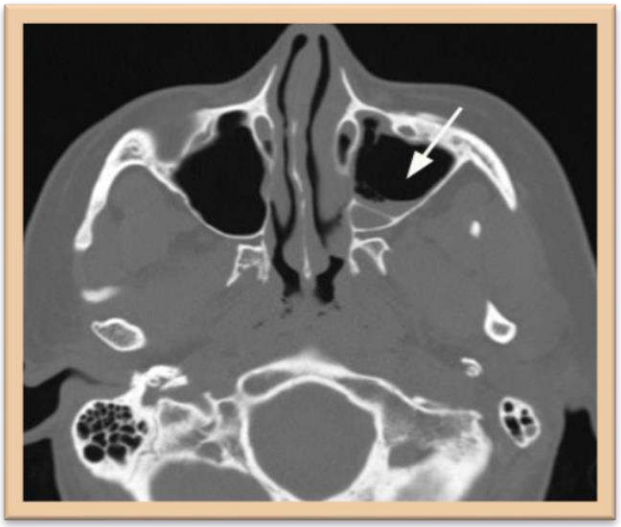
CT axial view shows a well-defined expansile lesion (black arrow) with sclerotic margin (red arrow), scattered calcification within the lesion (yellow arrow).



CT coronal view shows an expansile lesion in the right maxilla exhibiting features of calcification, presence of teeth displaced due to the lesion (black arrow) and involving the floor of the maxillary sinus.



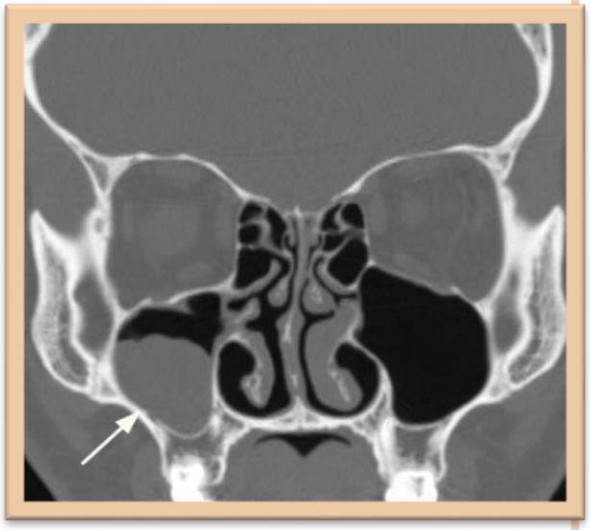
A computed tomography sagittal view of a frontal sinus active ossifying fibroma.



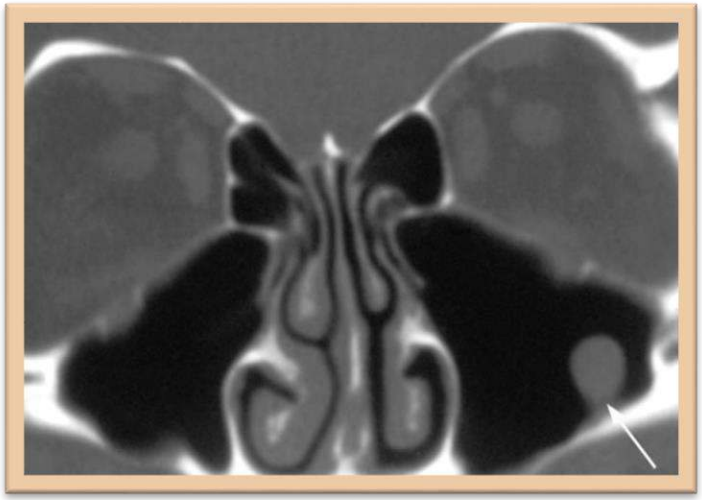
Axial image with arrow pointing to air-fluid level in maxillary sinus in acute sinusitis.



Axial image demonstrating additional case of acute sinusitis with arrows pointing to air-fluid levels in the Ethmoid and sphenoid sinuses



Coronal image with arrow pointing to right maxillary sinus Mucus Retention Cyst (MRC).

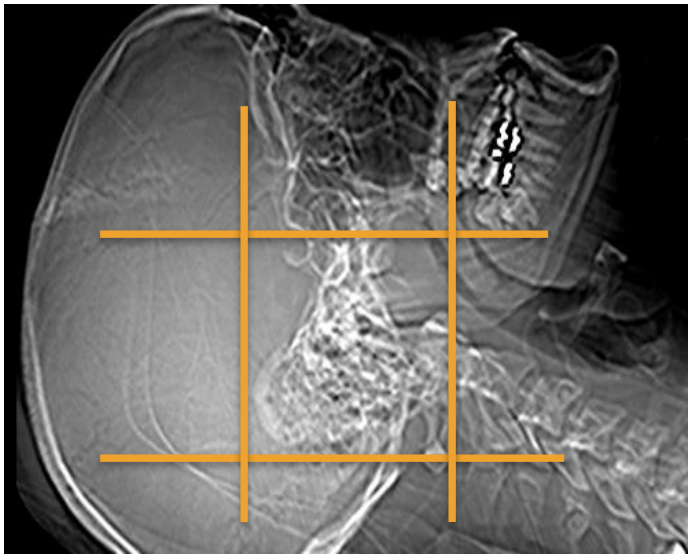


Coronal image with arrow pointing to maxillary sinus polyp. Often on imaging a polyp and mucus retention cyst cannot be differentiated

TEMPORAL BONE CT SCAN

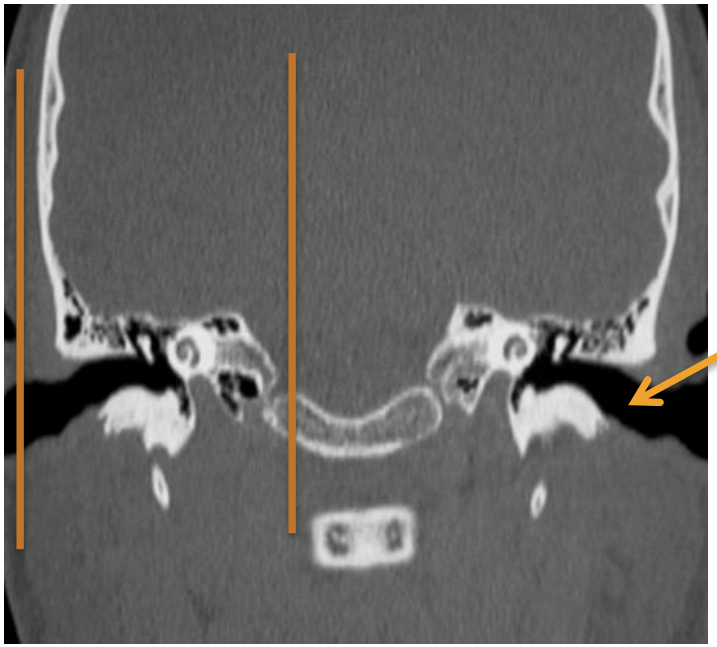
Temporal Bone CT

- Temporal bone CT, also known as mastoid bone CT is typically ordered to evaluate the outer ear, bones of the ear and inner ear structures for infection, tumor, injury or congenital or acquired hearing disorders.
- **Scout Image:** The patient is placed supine. The alignment of the plane is parallel to the Orbitomeatal line. This is set up to start at the top of the anterior arch of C1, and scan superiorly to the roof of the mastoid air cells.
- **kVp / Effective mAs / Rotation time (sec):** 120 / 160 / 1.0
- **Contrast:** 100cc Omnipaque 300 IV, R/O Some Malignant Lesions.
- **Reconstruction Filter:** Ultra High Bone Algorithm.
- **Thickness :** 1 mm.
- **Resolution :** High.
- **Bone Window: WC:** 400, **WW:** 4000
- **Soft Tissue Window: WC:** 50, **WW:** 350
- Submit images in bone and soft tissue algorithm.



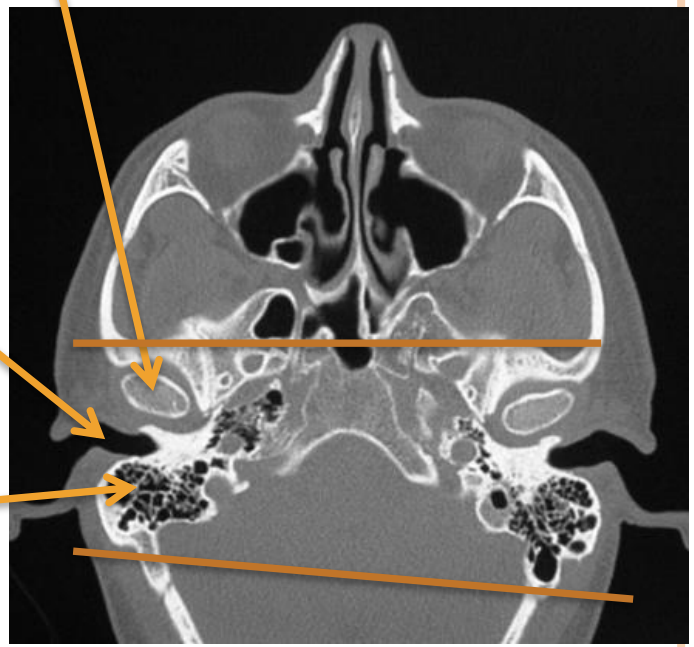
Scan Coverage: Above Petrous ridges to tip of mastoids

Mandibular Condyle

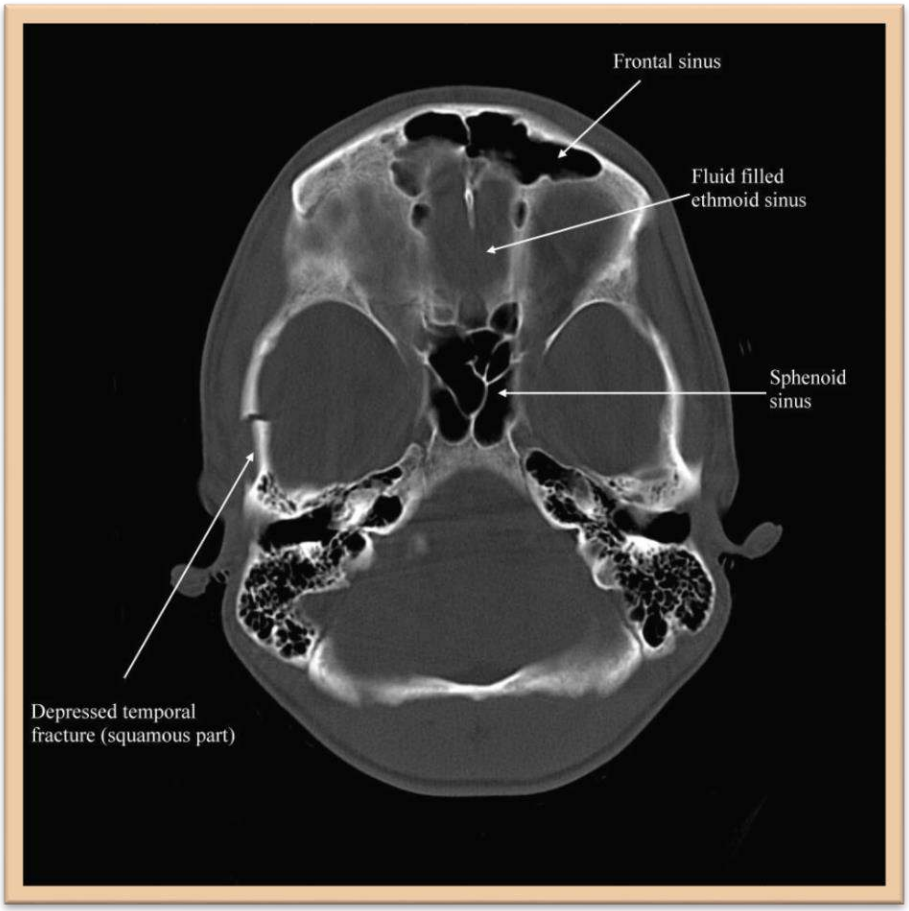


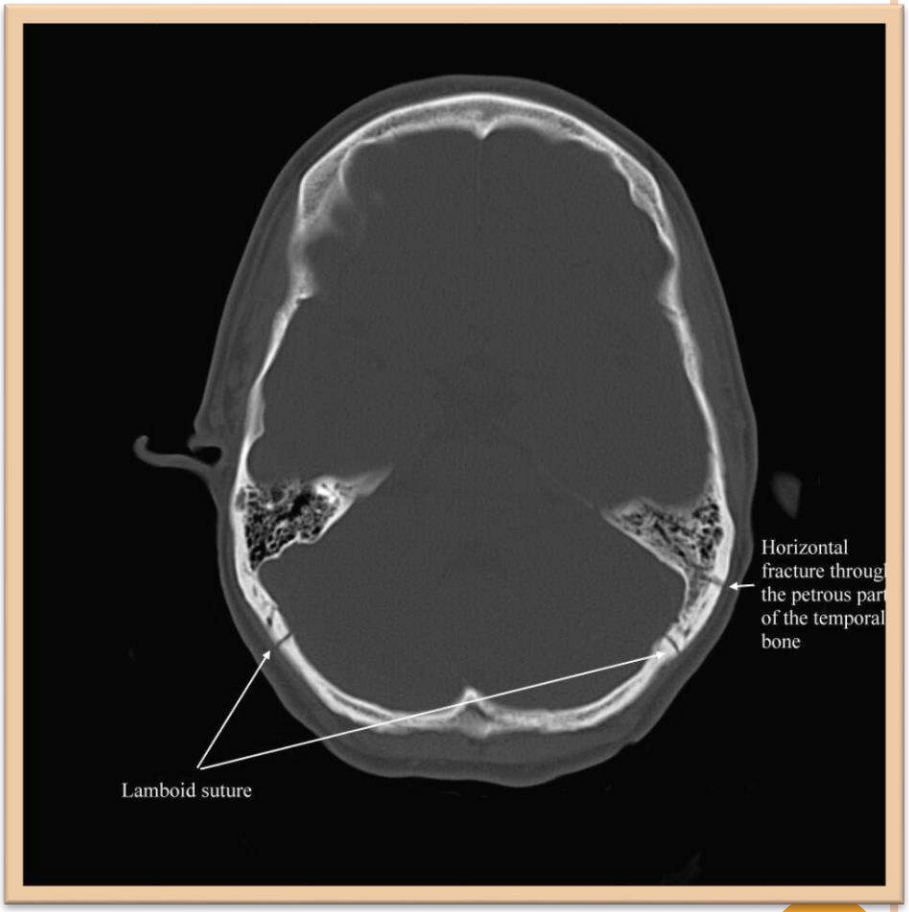
External Auditory Canals

Mastoid Air Cells



Temporal Bone Fracture



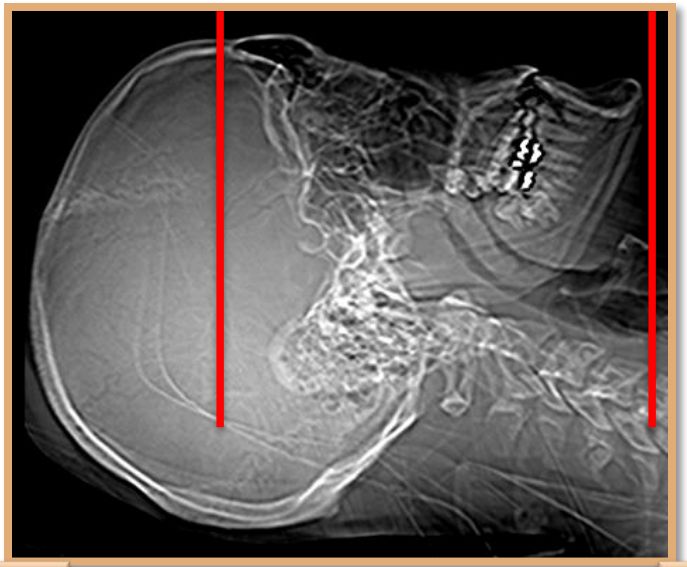


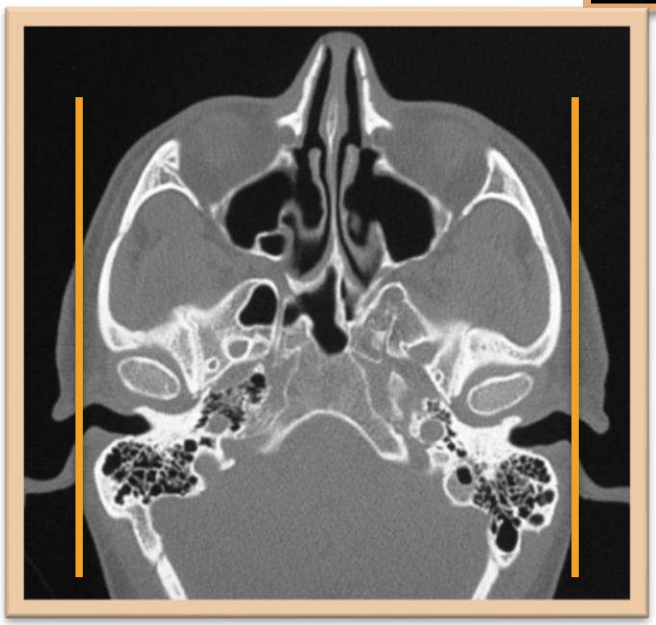
FACIAL BONE CT SCAN

Facial Bones CT (also use for mandible protocol)

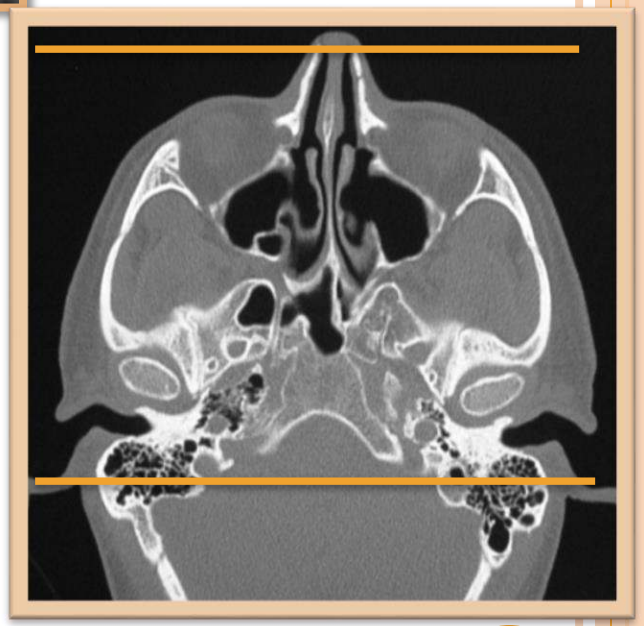
- A CT of the Facial Bones is an exam that takes thin slice (2 - 3.5 mm) images of the facial bone structure, including the jaw, nose, eye sockets and cheek bones. These images are helpful in the diagnosis of facial trauma and malformations.
- **Scout Image:** Patient is placed supine. The scan is set up to start below the mandible and continue superiorly through the frontal sinuses.
- **Bone Window:** **WC :** 200, **WW :** 2000
- **Soft Tissue Window:** **WC :** 50, **WW :** 350
- Submit images in bone and soft tissue algorithm.

Scan Coverage: below the Mandible through Frontal Sinuses.

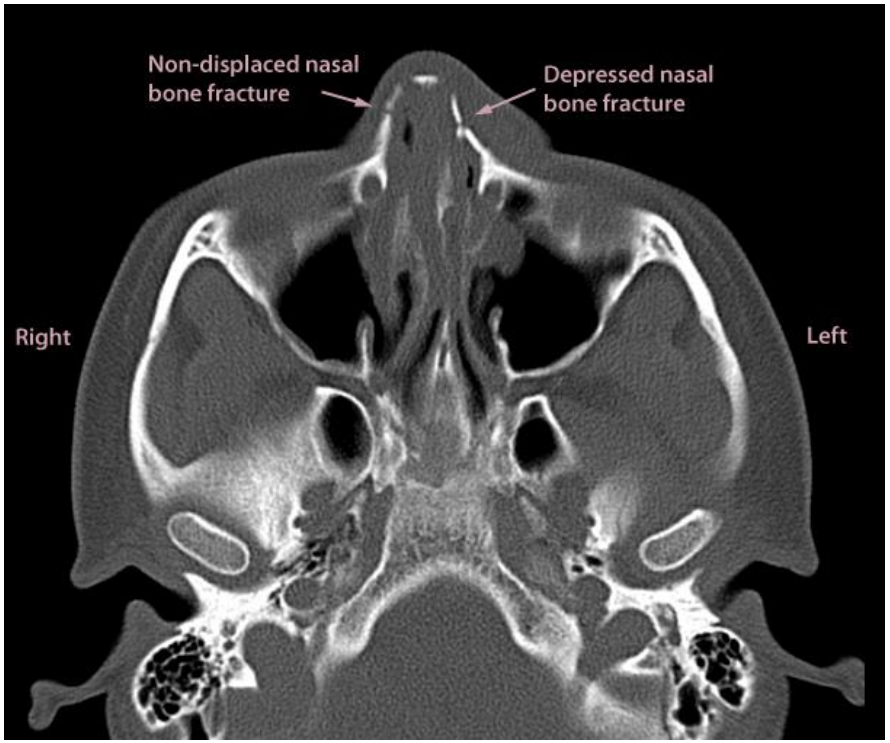




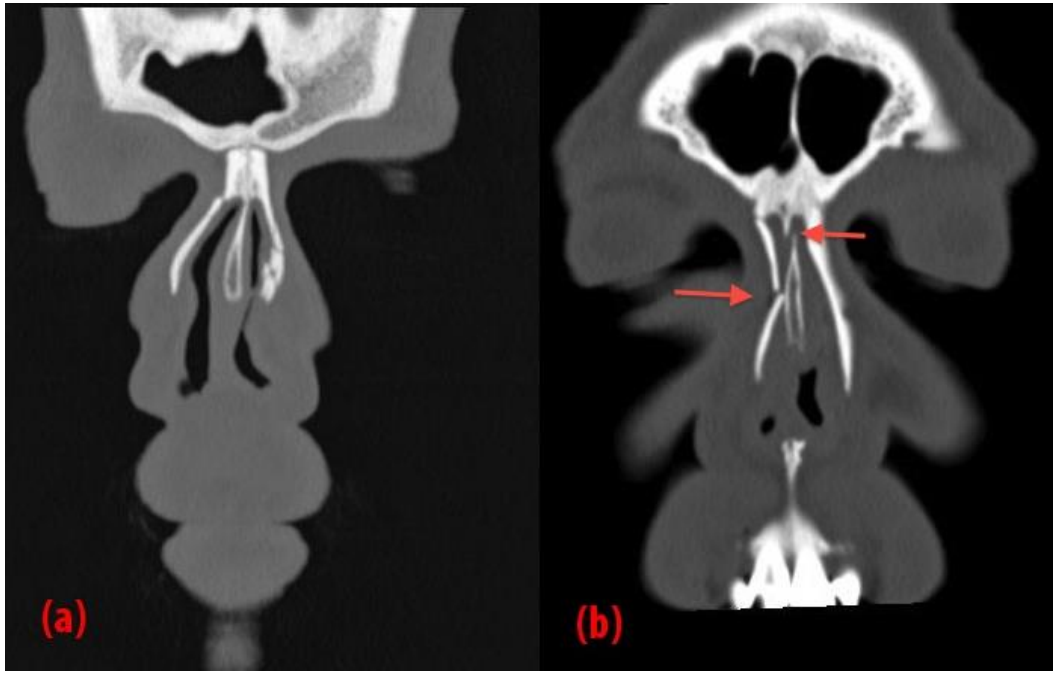
Sagittal reconstructions through Zygomatic arches



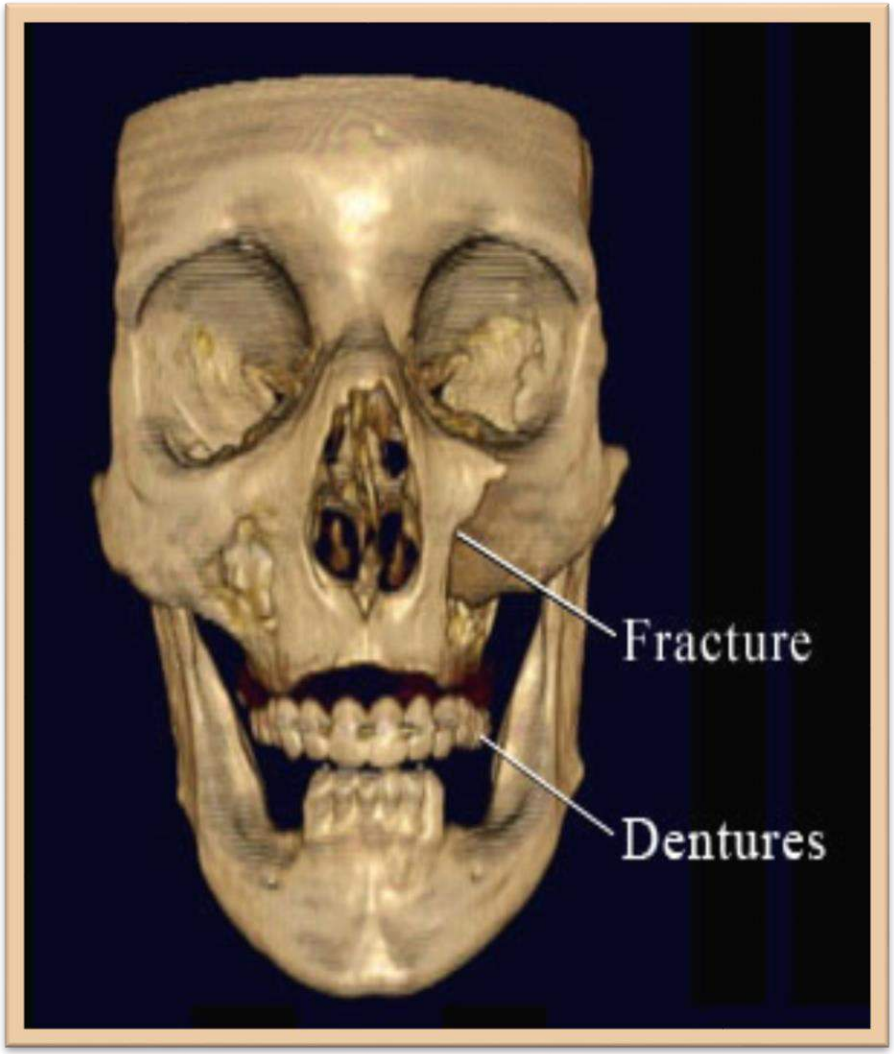
Coronal reconstructions external auditory canals through nasal bones



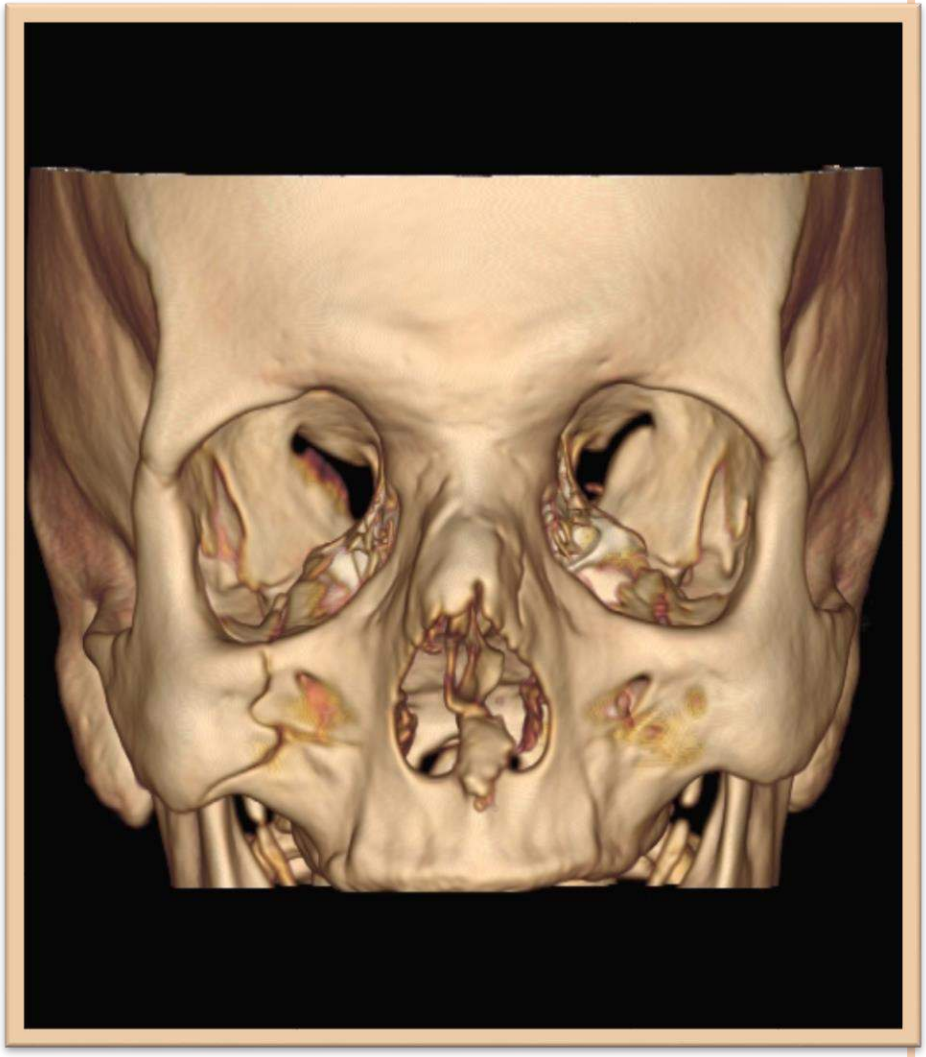
Nasal Bone Fracture



(a) Simple nasal fracture.
(b) Complex nasal fracture, note the fracture of the nasal septum.



three-dimensional (3-D) model made from a CT scan showing a broken (fractured) cheekbone that extends into the gum of the mouth.



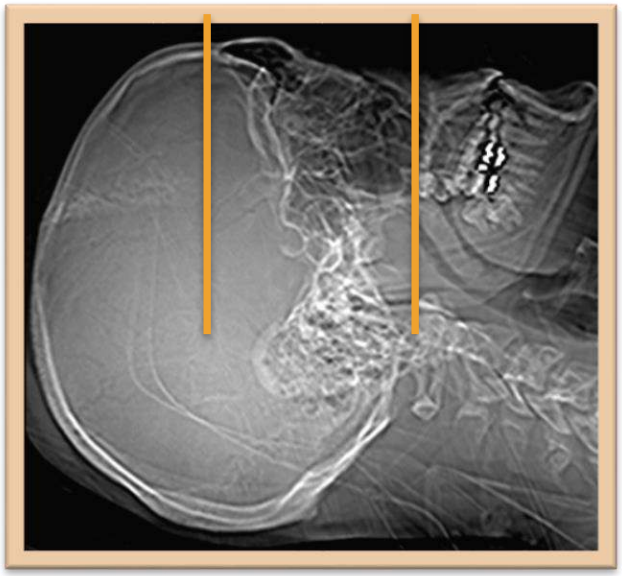
3-dimensional reconstruction of the fracture under the eye-socket on the right side of the image.

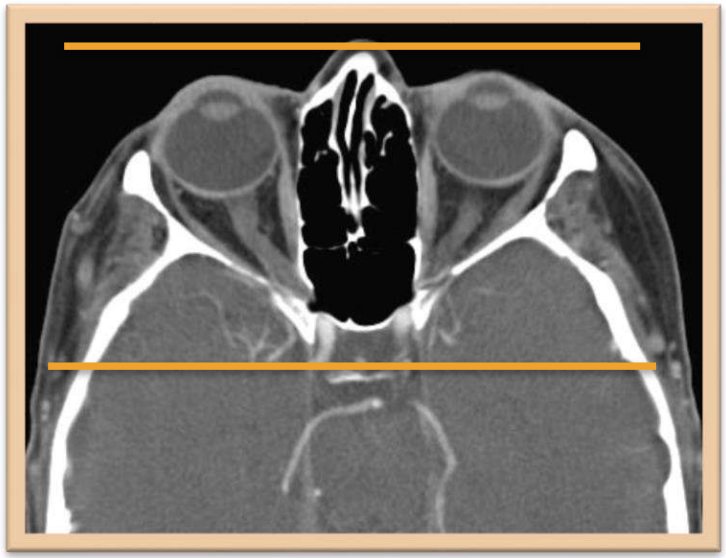
ORBIT CT SCAN

Orbit CT

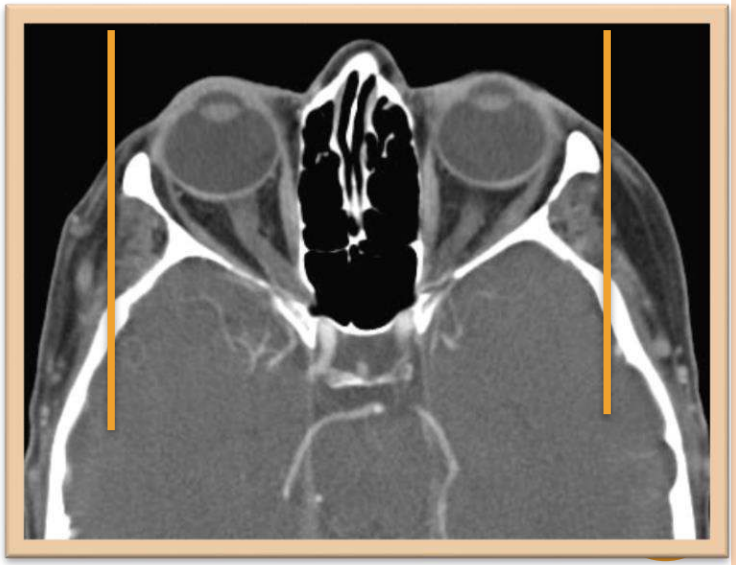
- A CT of the Orbits is an exam that takes thin slice images of the eyes and orbital socket at three different angles. This allows for the diagnosis of a range of conditions such as injury, disease and congenital defects.
- **Scout Image:** Patient is placed supine. The scan is set up to start at the hard palate and continue superiorly through the orbits above Frontal Sinuses..
- **Contrast:** 100cc Omnipaque 300 IV, R/O infection/abscess; assess orbital tumor; R/O lacrimal gland pathology; optic atrophy.
- **kVp / Effective mAs / Rotation Time (sec)** 120 / 170 / 0.75
- **Resolution:** High.
- **Bone Window: WC :** 200, **WW :** 2000
- **Soft Tissue Window: WC :** 50**, WW :** 350
- Submit images in bone and soft tissue algorithm.

Scan Coverage: Mid maxillary sinus to frontal sinuses.

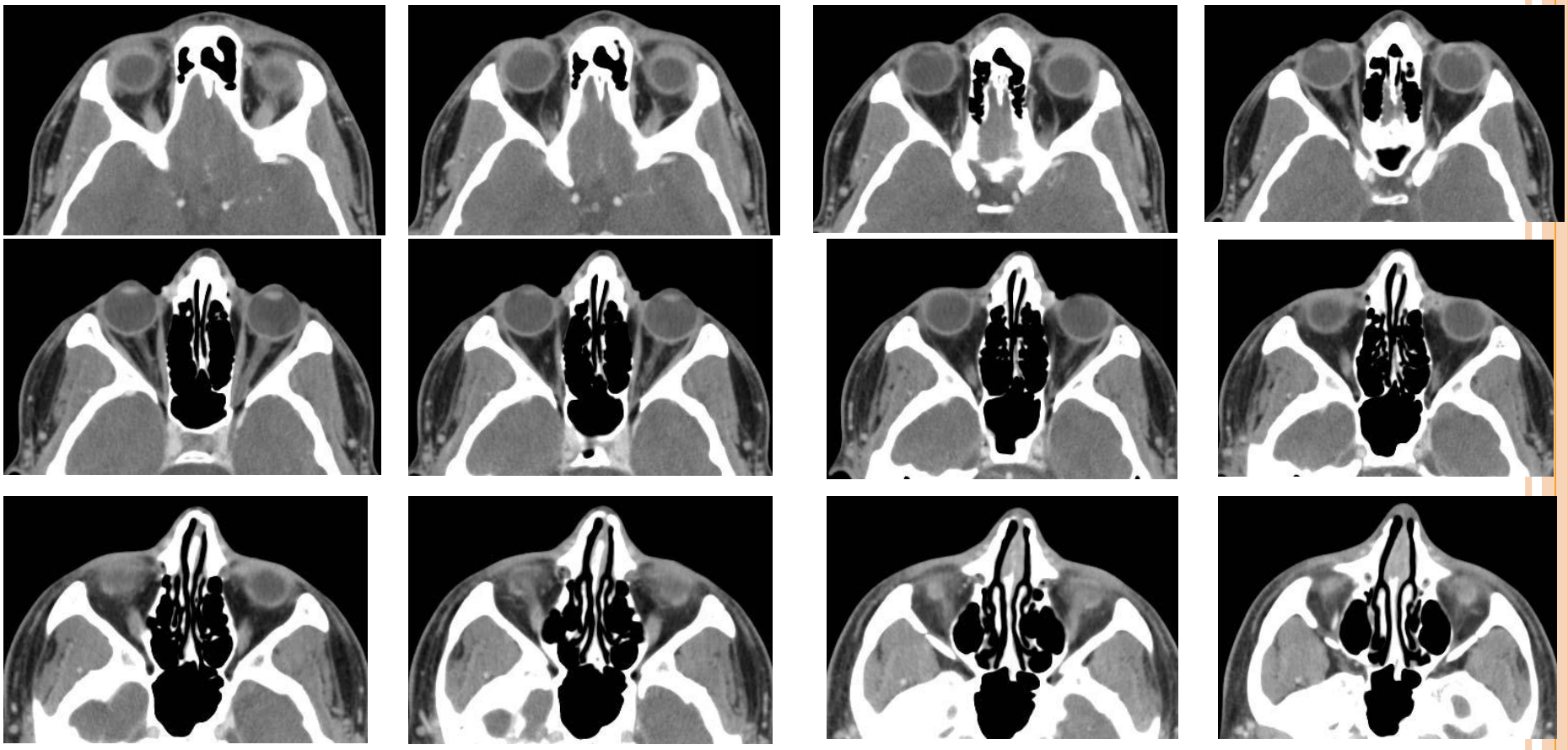




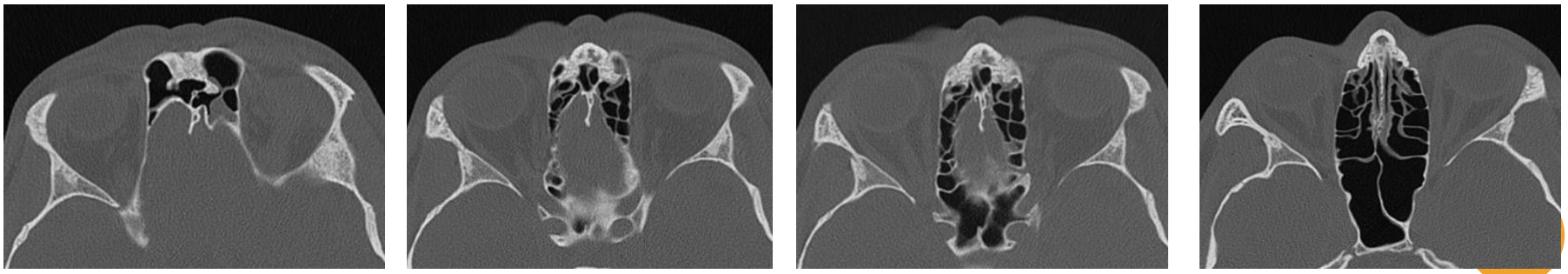
Coronal reconstructions



Sagittal reconstructions

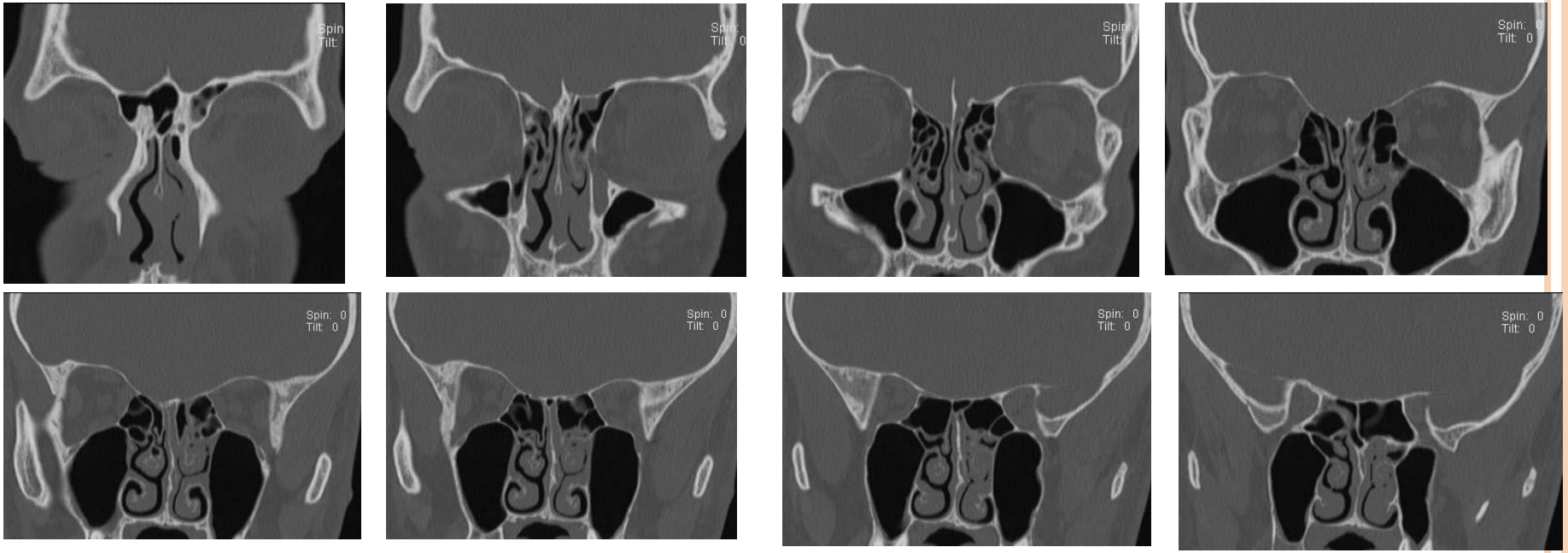


Orbit CT – Soft Tissue Window (Axial Plane)



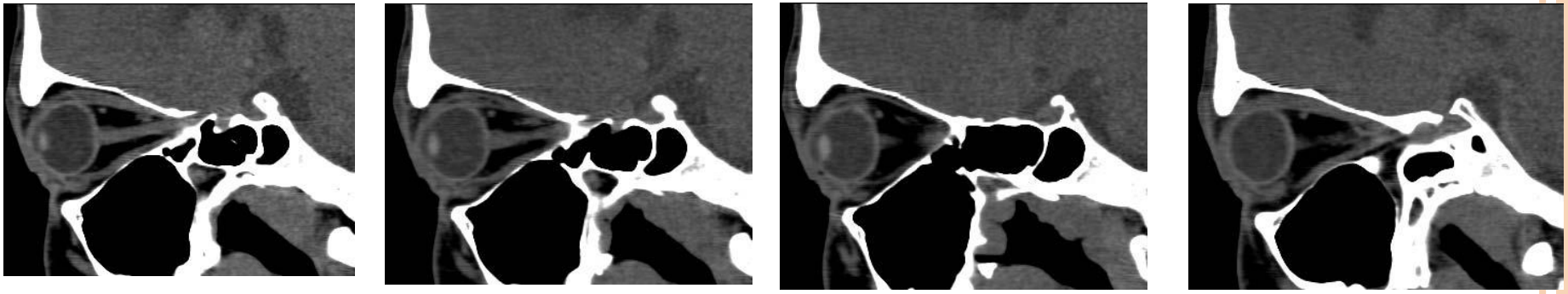
Orbit CT – Bone Window (Axial Plane)

Orbit CT – Bone Window (Coronal Plane)

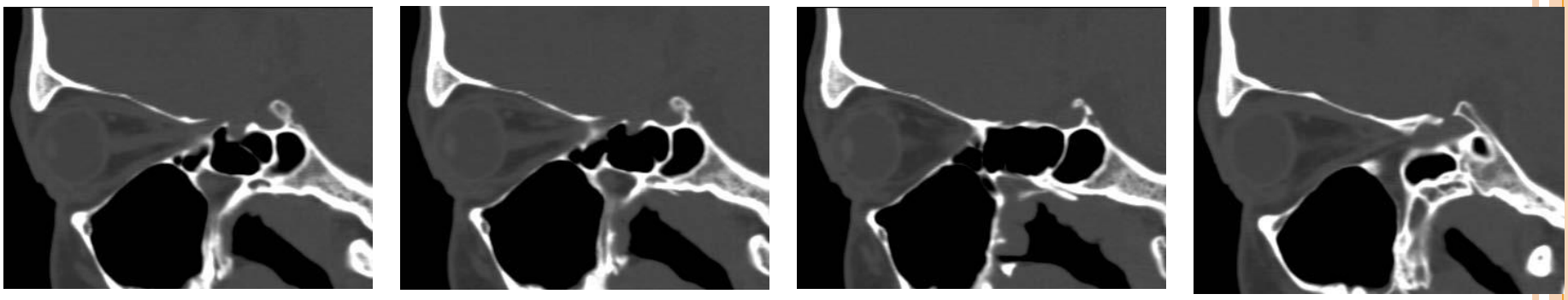


Orbit CT – Soft Tissue Window (Coronal Plane)



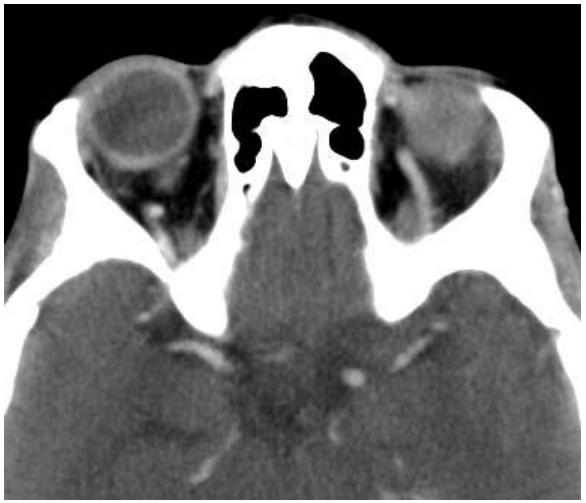


Orbit CT – Soft Tissue Window (Sagittal Plane)



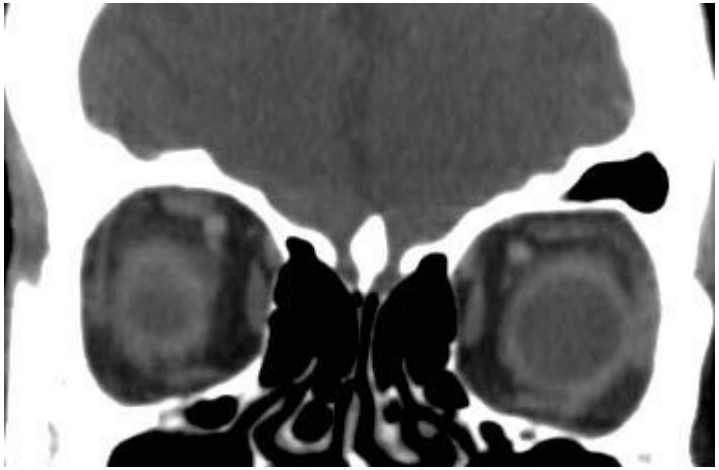
Orbit CT – Bone Window (Sagittal Plane)

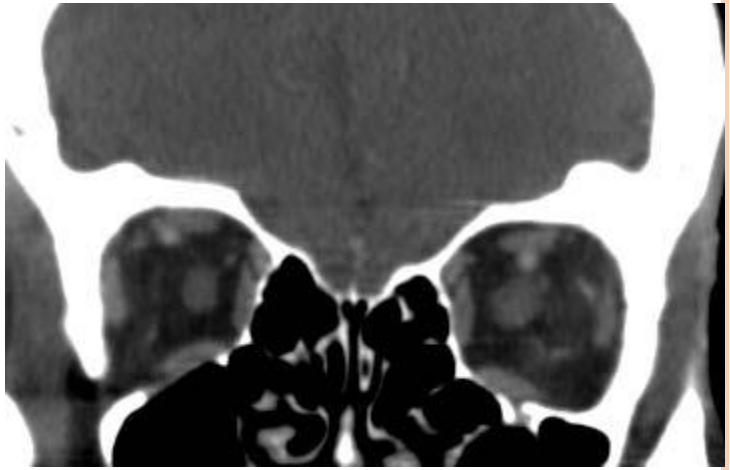
ORBIT CT
(with contrast)

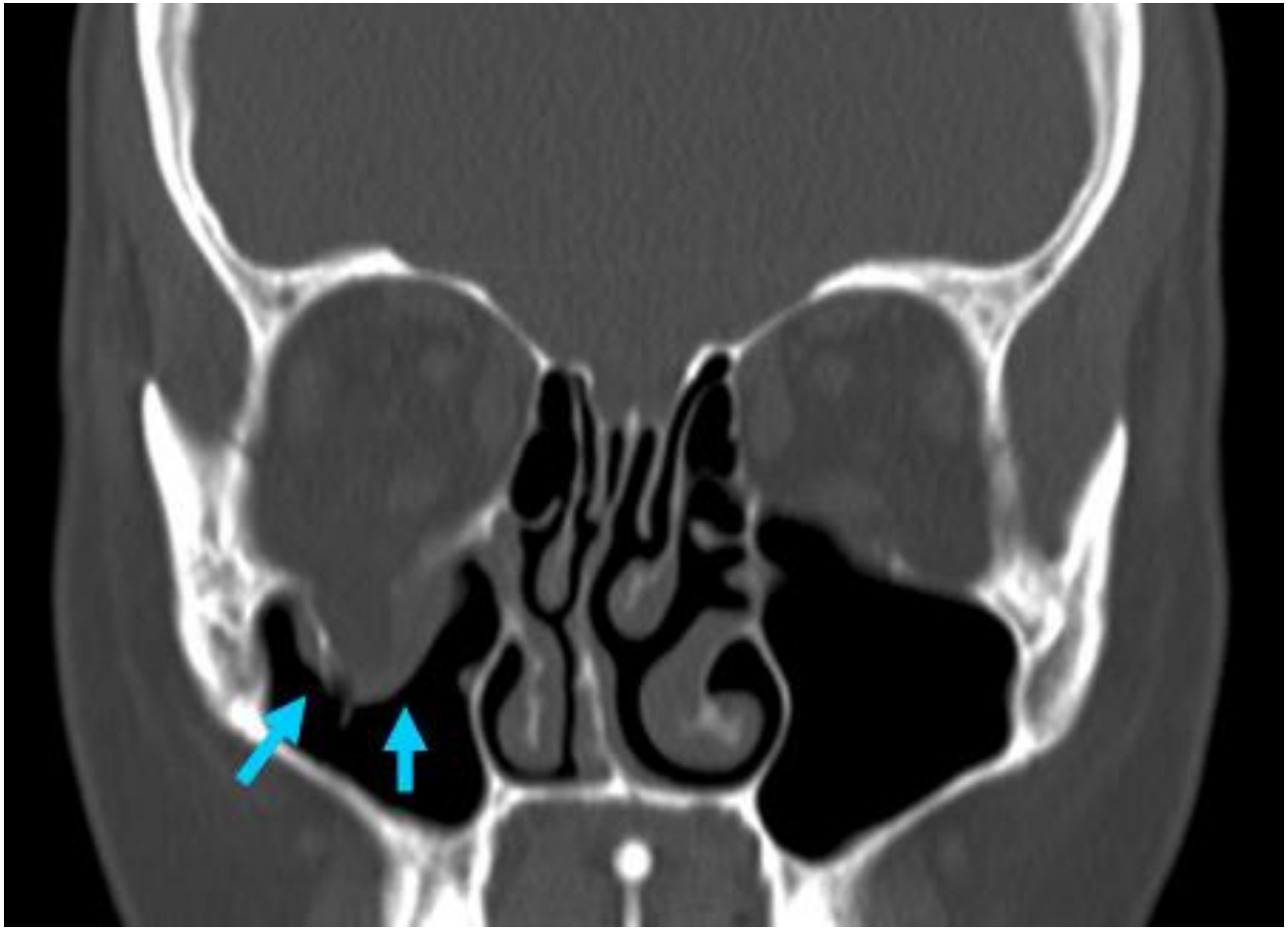












Right orbital blow-out fracture on CT-scan; coronal reformat

Thank You



Best Wishes For All