

# 3D IMAGING IN ORTHOPEDICS

Multislice Computed Tomography is an excellent modality for evaluation of the skeletal system.

Added information provided by 3D reconstructions can affect patient management and help plan intervention.

3D helps in better demonstrating complex injuries. Information about the relative positions of fracture fragments can be easily communicated to the Orthopedic surgeon.

# Indications for CT in Orthopedics

1. Trauma
2. Infection
3. Tumor
4. Post operative evaluation
5. Pediatrics : Developmental abnormalities and trauma

Trauma is a major indication for CT examination

# In patients with trauma, CT

Confirms a fracture which is equivocal on a radiograph

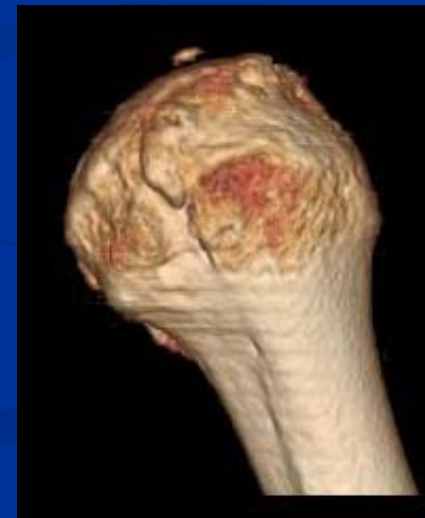
Determines the extent of the fracture in complex anatomical regions.

Evaluates the status post intervention.

Manual disarticulation of the joint at the 3D workstation removes overlying unaffected bone and improves visualization of underlying articular fractures, especially important in fractures involving

- Pelvis,
- Shoulder and
- Knee joint.

# Shoulder Joint



Volume rendered images Shoulder Joint fracture- manual separation of articulating bones

# Shoulder Joint



Volume rendered images of scapula - different projections

# Pelvis

3D allows multiplanar visualization of pelvis.

The volumetric data may be edited to isolate the fracture, the femur may be disarticulated from the acetabulum.

Anterior structures can be removed to assess sacral pathology.

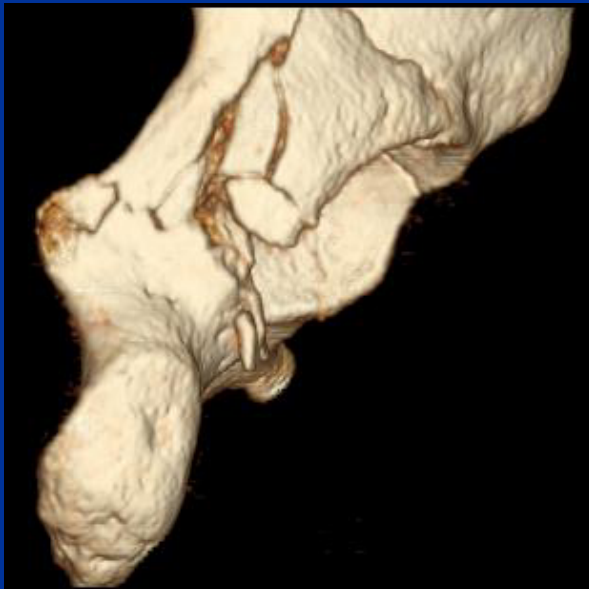


# Hip Joint



Volume rendered images Hip Joint fracture - With and without overlying femur

# Hip Joint



Volume rendered images of acetabular fracture in different projections. Overlying femur removed to better demonstrate the fracture

# Face

3D CT of face is a front line diagnostic tool in identification of complex fractures of the face. Colored VR and “Transparent” VR presets are advantageous in mandibular , maxillary and orbital fractures to assess their extent.

# Face



3D of Face - Colored Volume rendering and Transparent VR preset

# Complex Facial Fractures



Volume Rendered images of face- before and after manual separation of mandible from rest of face



# Complex Mandibular Fractures



VR images of mandible – Bilateral fractures

# Post operative evaluation

Multislice CT with Volume rendering can produce high quality images which demonstrate the relationship between the hardware, bones and bone fragments.

Streak artifacts from hardware can be minimized by using optimal scan protocols and VR images.

# Post operative evaluation



VR images of Left Hip Joint – Hip prosthesis in place