

## Points

Artifacts from metal have traditionally hampered post-instrumentation imaging with CT and MRI

With the new 64-slice CT scanners, the metal-artifact reduction in the coronal and sagittal planes is significant enough to allow adequate visualization of the underlying anatomy and pathology

As a result, areas with instrumentation can be easily scanned to visualize the status of the fracture, the instrumentation itself, the presence or absence of recurrence or the development of new complications

## Bone and Joint CT with Reduced Artifacts in the Presence of Orthopedic Hardware

CT and MRI both have problems in the presence of instrumentation. With MRI there are void artifacts at the site of the metal, whereas with CT, there has traditionally been a problem of streak artifacts, which prevent adequate visualization of the underlying anatomy and pathology.

With the new 64-slice, multi-slice CT scanners, there is such an improvement with metal-artifact reduction, that the inherent anatomy and pathology of the area concerned is visible almost artifact-free. This is especially appreciated on the isotropic coronal and sagittal images.

This helps in the following situations.

1. Post-hip replacement acetabular osteolysis (Fig. 1)
2. Visualization of fracture union / non-union (Fig. 2)
3. Complications of instrumentation (Fig. 3)
4. Recurrence of disease (tumor, etc) (Fig. 4)



Fig. 1A

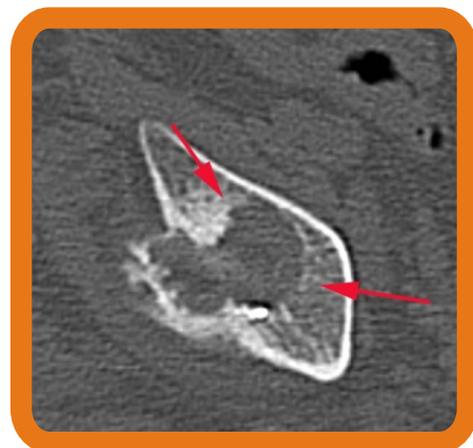


Fig. 1B

**Fig. 1(A,B):** Post total hip replacement (THR) acetabular osteolysis. This patient had pain 5-years following a THR. The plain radiographs were non-contributory. The coronal CT scan shows confluent osteolysis along the acetabular margin, the osteolytic areas communicating with the joint space (arrows). The axial image (B) shows this as well. The extent of osteolysis could be easily estimated on all the images.

The online version is up at <http://www.jankharia.com/innerspaces/current.htm>



Fig. 2A



Fig. 2B

**Fig. 2 (A, B):** Non-united subcapital fracture. This lady, a year after surgery for a subcapital fracture of the femoral neck, had persistent pain. The plain radiography (A) was non-contributory. The coronal CT image (B), clearly shows the non-union (arrows)



Fig. 3A

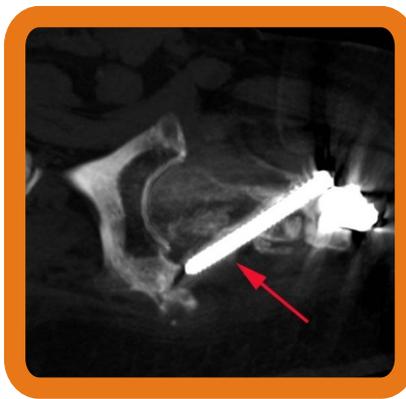


Fig. 3B



Fig. 3C

**Fig. 3 (A-C):** Improper screw placement. Following surgery for an inter-trochanteric fracture (A), the patient had persistent pain. Plain radiographs were non-contributory, so a CT scan was performed. The axial thick MIP (maximum intensity projection) image (B) shows clearly the position of the screw, which has obliquely cut through the posterior cortex. This is well seen on an oblique thick MIP image (C) as well.



Fig. 4A

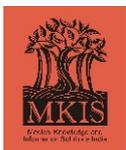


Fig. 4B

**Fig. 4 (A,B):** Recurrent giant cell tumor (GCT) of the femur. This 32-years old man who had been operated for a GCT of the femur with enucleation, grafting and instrumentation, presented with pain. Since an MRI would have yielded no information whatsoever, a CT scan was performed. A coronal image (A) clearly revealed an expansile, osteolytic lesion, with a sharp clear superior margin, marking the tumor extent. The bone fragments from the early bone graft were seen within the recurrent tumor (arrowheads). The sagittal image (B) also clearly showed the tumor margins (arrow), along with the posterior cortical thinning (arrowhead).

More cases showing the use of CT in the presence of orthopedic hardware are up at <http://bhavin.typepad.com/radiology>

Designed and published by



**Forthcoming Newsletters**



- Prostate MRI
- TM jt MRI
- MRI of SI joints
- Dental CT

**Main Clinic**

Bhaveshwar Vihar,  
383, Sardar V. P. Road,  
Mumbai - 400 004  
Tel : 022-2388-4015  
Email : info@jankharia.com

**Cardiac & Ultra fast CT scan**

Nishat Business Center,  
Arya Bhavan, 461, S. V. P. Road,  
Mumbai - 400 004  
Tel : 022-2389-3551  
Fax : 022-2382-9595

**Subscribe**

Provide your name and  
address at  
subscribe@jankharia.com  
Tel : 022-2388-4015  
(Benny or Shamina)