

Evidence Discussion (MS 3)

3D Rendering

3D CT improves both the reliability and the accuracy of radiographic characterization of articular fractures of the distal radius and influences treatment decisions, compared to 2D imaging alone. 3D reconstructions can be particularly helpful in preoperative planning for complex articular injuries. The addition of 3D reconstructions to standard 2D CT images has been shown to change operative management in up to 48% of intra-articular distal radius fractures.

In the evaluation of traumatic elbow injuries, 3D CT reconstruction of coronoid and olecranon fractures can identify specific shapes, sizes, and orientations of fracture fragments associated with various patterns of traumatic elbow instability which can impact surgical treatment planning.

In shoulder trauma, 3D CT images may better characterize fracture patterns and humeral neck angulation, which can affect functional outcomes. 3D CT images can better visualize scapula fracture displacement and angulation.

Pelvic and acetabular fractures can be difficult to appreciate on routine radiographs. Complex injuries and subtle fractures, especially in the axial plane, can be better demonstrated on 3D CT images.

For the assessment of postoperative alignment in trauma patients with ankle pilon fractures, studies have found 3D reconstruction with MRI to be comparable to that of 3D CT reconstructions. Evaluations of complex trauma, articular surfaces, and osseous alignment are potential indications in ankle imaging that may benefit from 3D reconstruction.

In a study of 35 patients with multiple rib fractures requiring surgical stabilization, imaging with 3D CT in addition to 2D CT and plain radiography changed the surgical plan in 65.7% of the cases, compared to imaging with plain radiography and 2D CT alone.

References:

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