

Midfoot Arthritis

Midfoot arthritis occurs when there is loss of cartilage at the tarsometatarsal and/or navicular-cuneiform joints. It has the potential to cause significant pain, disability, and decreased quality of life. The most common etiology is posttraumatic degeneration, but primary degeneration and inflammatory diseases can also result in osteoarthritis of the midfoot joints.

A weight bearing CT scan can:

- Provide a clearer assessment of degenerative changes and joint space narrowing within the midfoot joints, which is normally impaired due to the natural overlap of adjacent midfoot bones viewed two-dimensionally with conventional radiography¹.
- Reproduce the physiological positioning of the foot to perform an accurate assessment of deformities and pathology².

Diagnosis

An accurate diagnosis and grading of the severity of osteoarthritic joints in the midfoot have been shown to be clinically relevant in treating the pathology early in its course and avoiding late-stage invasive procedures such as arthrodesis³.

In addition, WBCT better quantifies³ the structural deformity of Chopart, talonavicular, and calcaneocuboid joints when compared to conventional radiography and non-weight bearing computed tomography images.

Treatment Planning

Patients with unresolved symptoms after conservative treatment may be indicated for midfoot arthrodesis. A WBCT scan is an important tool in the planning and execution of midfoot surgical interventions. As a result of the complex structural anatomy, WBCT can help surgeons better visualize³ which joints may be pain generators and need to be included in the fusion.

In addition, the high reliability and reproducibility^{4,5} of WBCT images for the three-dimensional evaluation of the midfoot joints can help the foot and ankle surgeon determine the amount of correction required to appropriately realign the midfoot during surgery.

Postoperative Assessment

For postoperative evaluation of operative treatment of midfoot arthritis, a WBCT can:

- Accurately assess the adequacy of correction⁶.
- Accurately assess the healing process of midfoot joint fusions³.
- Act as a reliable method of identifying potential early failures in surgical treatment, which can help surgeons intervene earlier or plan a reoperation to obtain a favorable outcome⁶.



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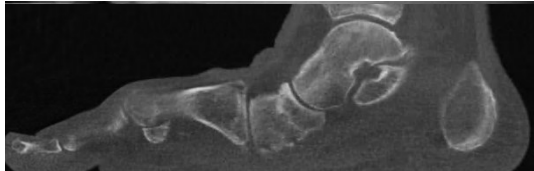
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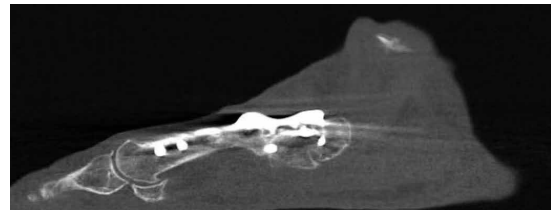
65 yo female with bilateral midfoot pain for 20 years, worse on the right side.

Images demonstrated severe degeneration of the midfoot joints. However, the severity of deformity and involved joints were difficult to determine on plain radiographs alone. As shown here, subluxation at the first and second TMT joints was better visualized on WBCT (bottom two scans) images than conventional radiographs (top scan).



Post-Op Assessment

Obtaining a WBCT scan postoperative assists in the visualization of adequate restoration of the midfoot alignment, especially when surgical intervention was performed at multiple joints. Additionally, WBCT scans can assess bony bridging and fusion across the midfoot joints.



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(2) Greisberg J, Hansen ST Jr, Sangeorzan B. Deformity and degeneration in the hindfoot and midfoot joints of the adult acquired flatfoot. *Foot Ankle Int.* 2003 Jul;24(7):530-4. doi: 10.1177/107110070302400704. PMID: 12921357.

(3) Steadman J, Sripnich Y, Rungprai C, Mills MK, Saltzman CL, Barg A. Comparative assessment of midfoot osteoarthritis diagnostic sensitivity using weightbearing computed tomography vs weightbearing plain radiography. *Eur J Radiol.* 2021 Jan;134:109419. doi: 10.1016/j.ejrad.2020.109419. Epub 2020 Nov 21. PMID: 33259992.

(4) Lintz F, Mast J, Bernasconi A, et al. 3D, Weightbearing Topographical Study of Periprosthetic Cysts and Alignment in Total Ankle Replacement. *Foot & Ankle International.* 2020;41(1):1-9. doi:10.1177/1071100719891411

(5) Farracho, L. C., Moutinot, B., Neroladaki, A., Hamard, M., Gorican, K., Poletti, P. A., Beaulieu, J. Y., Bouvet, C., & Boudabbous, S. (2020). Determining diagnosis of scaphoid healing: Comparison of cone beam CT and X-ray after six weeks of immobilization. *European journal of radiology open*, 7, 100251. <https://doi.org/10.1016/j.ejro.2020.100251>

(6) Thompson MJ, Consul D, Umbel BD, Berlet GC. Accuracy of Weightbearing CT Scans for Patient-Specific Instrumentation in Total Ankle Arthroplasty. *Foot Ankle Orthop.* 2021 Dec 8;6(4):24730114211061493. doi: 10.1177/24730114211061493. PMID: 35097485; PMCID: PMC8664310.