DISIOR

CASE STUDY

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Arthritis of the first tarsometatarsal (TMT-1)

PRESENTATION

- Arthritis of the first tarsometatarsal (TMT-1) causes pain. It is commonly caused by trauma or primary instability[1] and affects many patients that consult with foot specialists.
- This patient presented with medial midfoot pain that had been ongoing for several months. I had a bilateral weight-bearing computer tomography (WBCT) conducted to get an accurate 3-dimensional (3D) image of the patients' anatomy under natural loading conditions.

> *"It was one of these subtle cases and I needed to get an accurate 3D model and distance map to see how to approach this patients' treatment."*
>
> Dr F. Lintz, M.D.

INITIAL EXAMINATION

- The medical images were run through the Foot & Ankle module of Disior's Bonelogic® 2.0 software and additional 3D analysis were performed by Eero Huotilainen, PhD, Senior Principal Engineer Algorithms and Products at Disior Ltd.

- The accurate 3D models, revealed a very subtle but asymmetrical TMT1 arthritis on the left foot, where the metatarsal had slipped on the cuneiform **(Figure 1).**
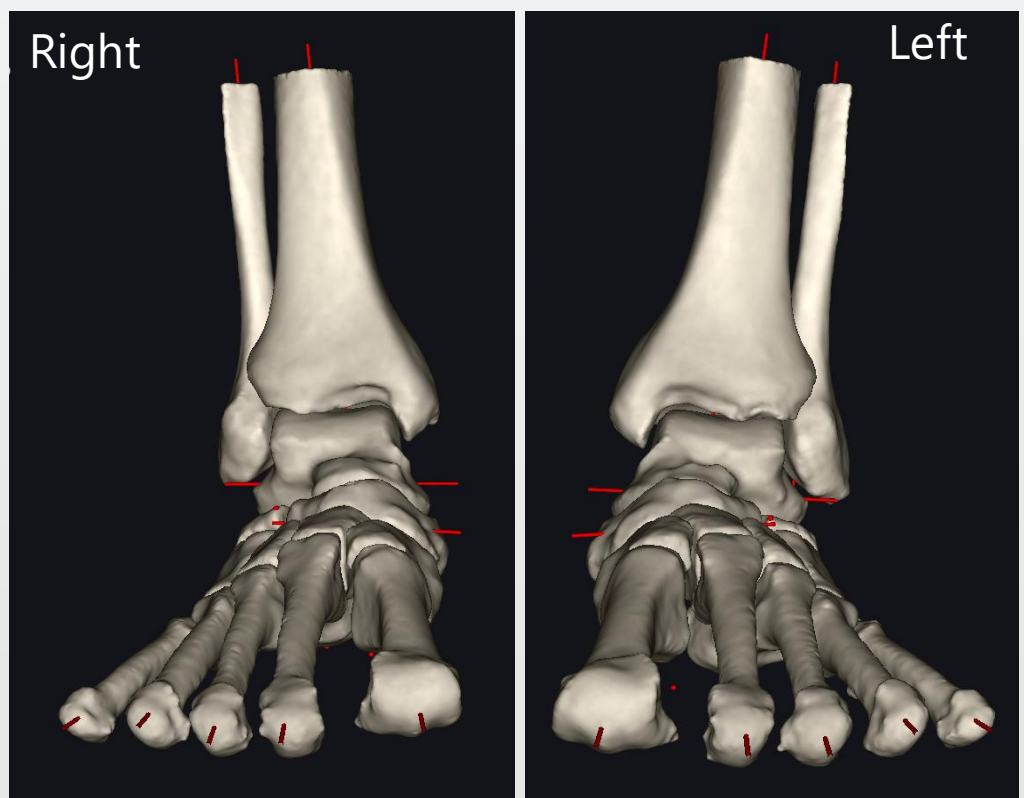

Figure 1 Patient's feet in AP view, on the left foot MT1 slipped over cuneiform.

FURTHER INVESTIGATION

- By comparing the joint spacing between the left and right TMT1 you can see the subtle narrowing of the left TMT1 joint indicative of arthritis (**Figure 2**).

- Distance mapping of the Lisfranc region showed subluxation and approximation in the dorsal aspect of the joint explaining the patient's pain **(Figure 3)**.
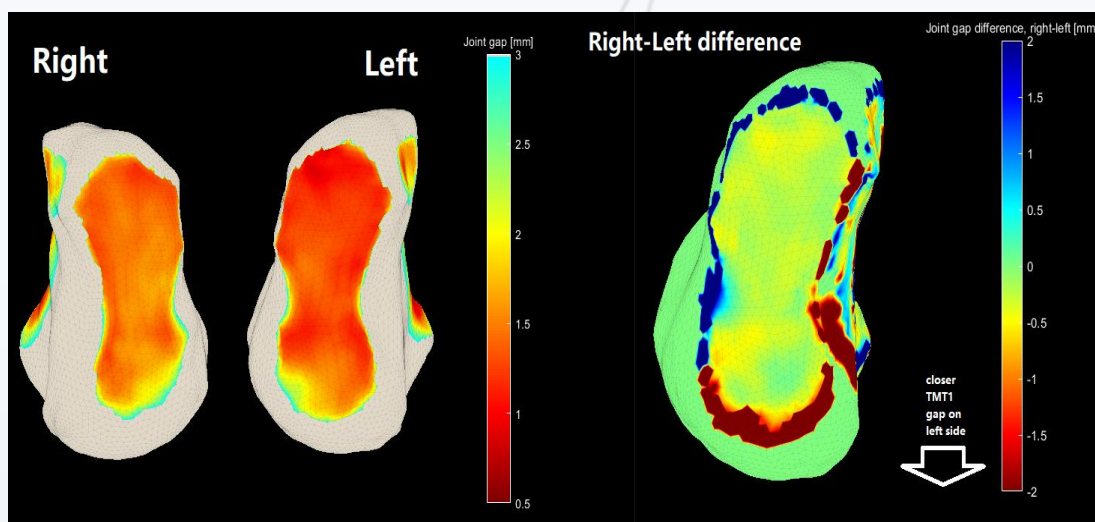

Figure 2 Right-left comparison of TMT1 Joint space, a custom analysis protocol.

Figure 3 Distance mapping in the Lisfranc area.

TREAMENT DECISION

These insights allowed me to choose the most appropriate treatment: firstly, a pair of supporting insoles, then a TMT1 fusion.

"This case clearly illustrates why Disior's software Bonelogic® 2.0 is a game changer for common foot problems."

Dr F. Lintz, M.D.

References:
1. Kapoor *et al.*, 2016. Cures 8(12), e923

Featured Product: Bonelogic® 2 Foot and Ankle Module

PRODUCT INFORMATION

- Disior provides clinicians with the accurate diagnostic information they need to deliver perfectly-tailored treatment to every patient.
- Disior's 3D analysis software is a fast and cost-efficient way to get objective data for accurate diagnosis, create patient-specific surgical plans and assess treatment efficacy.

BENEFITS OF BONELOGIC ® 2

- Makes diagnosis unambiguous with automated, easy-to-use tools that remove manual labor.
- Assess patient's anatomy with objective and reliable anatomical analytics based on clinical landmarks and reference points.
- 3D analysis can now be part of routine clinical practice and research.

INDICATIONS FOR USE

Bonelogic® contains the measurement template with a set of distance and angular measures. The measurements can be used for diagnostic purposes. The three-dimensional (3D) models are displayed and can be manipulated in the software. Together, the information from the measurements and the 3D visualization can be used for treatment planning in the field of orthopedics (foot and ankle, and hand and wrist). The 3D models can be outputted from the software for traditional or additive manufacturing.

INTENDED USE

Bonelogic® software is intended to be used by specialized medical practitioners to assist in the characterization of human anatomy with three-dimensional (3D) visualization and specific measurements. The medical imaging modalities intended to be used in the software are computed tomography (CT) images, cone beam computed tomography (CBCT) images and weight-bearing cone beam CT (WBCT) images. The intended patient population is adults over 16 years of age.
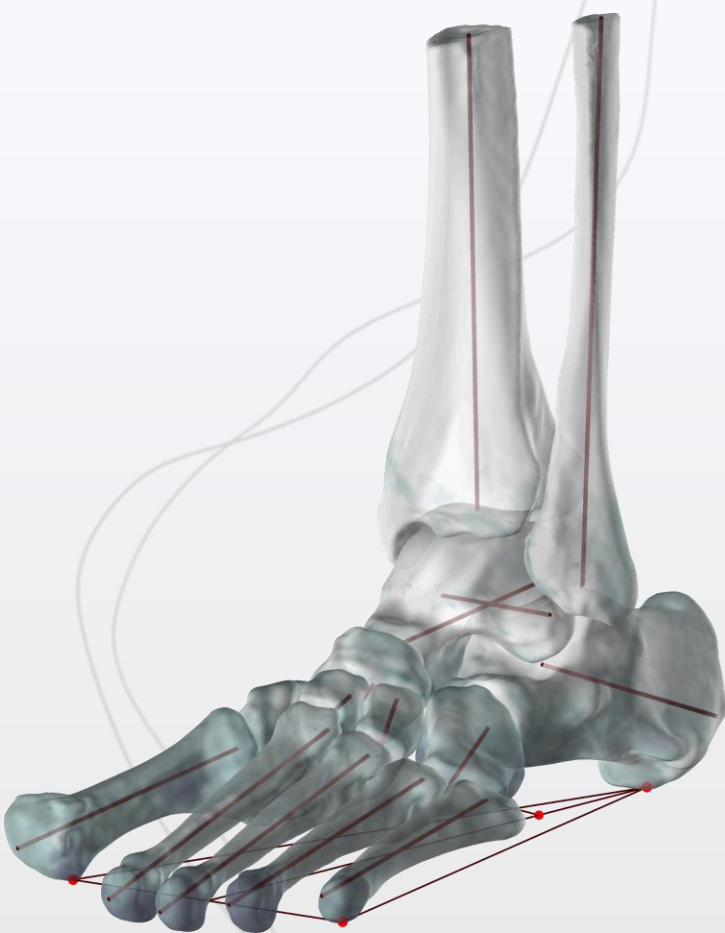
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For further information, see the device-specific instructions for use on
www.disior.com/bonelogic-2