Measuring Visualized Joint Surface in Hallux Metatarsophalangeal Arthroscopy

Michael Hull, MD, John T. Campbell, MD, Rebecca Cerrato, MD, Clifford Jeng, MD, R. Frank Henn, MD

Category: Arthroscopy, Midfoot/Forefoot

Keywords: hallux metatarsophalangeal MTP arthroscopy forefoot

Introduction/Purpose: Arthroscopy has been increasingly utilized to evaluate small joints in the foot and ankle. In the hallux metatarsophalangeal (MTP) joint, little data exist evaluating the efficacy of arthroscopy to visualize the articular surface. The goal of this cadaveric study was to determine how much articular surface of the MTP joint could be visualized.

Methods: Ten (10) fresh cadaveric foot specimens were evaluated using standard arthroscopy techniques. Arthroscopy was performed with gravity distraction utilizing a 1.9mm 30° arthroscope and small joint instruments. The edges of the visualized joint surface were marked with curettes and Kirschner wires; the joints were then surgically exposed and imaged. The percentage of cartilage visualized (visualized / total cartilage x 100%) was measured using ImageJ® software. Measurements include surface area visualized on axial imaging as well as arc visualized on lateral imaging.

Results: On the distal 2-dimensional projection of the joint surface, an average 57.5% (49.6 – 65.3) of the metatarsal head and 100% (100-100) of the proximal phalanx base were visualized. From a lateral view of the metatarsal head, an average 72° (65-80) was visualized out of an average total articular arc of 199° (192-206), for an average 36.5% (32.2 – 40.8) of the articular arc.

Conclusion: The results suggest that hallux MTP arthroscopy visualizes a sizable portion of the joint surfaces. However, incomplete visualization could potentially miss a hallux metatarsophalangeal lesion. Further imaging preoperatively may improve diagnostic confidence.

Foot & Ankle Orthopaedics, 2(3)
DOI: 10.1177/2473011417S000205
©The Author(s) 2017

This open-access article is published and distributed under the Creative Commons Attribution-NonCommercial 3.0 License (http://www.creativecommons.org/licenses/by-nc/3.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).