

# Forefoot Pain: A Differential Diagnosis Using Diagnostic Ultrasound

Case study by **Marty Wendelken, DPM**, Product Specialist, Ultrasound, 20/20 Imaging, Division of Konica Minolta



Dr. Marty Wendelken has 20 + years of experience in musculoskeletal Ultrasound. He is a noted lecturer, and published author on diagnostic ultrasound. He also was an adjunct professor at Temple Univ. School of Podiatric Medicine. Currently Dr. Wendelken is working with 20/20 Imaging as their musculoskeletal educator and product specialist of the lower extremity / foot and ankle.

**History-** A 71 year-old active male presented with a recent onset of pain in the plantar aspect of the right forefoot in the area of the MPJ's #2 and 3. He stated that he was hiking a week prior and is experiencing pain with ambulation. No history of acute injury was noted. Physical exam reveals normal pedal pulses, neurological, and range of motion of the right ankle. No swelling, erythema or edema was found in the area of chief complaint. Radiographs were obtained and were unremarkable. A musculoskeletal ultrasound was performed using a linear array 4-18 MHz probe. The plantar aspect of the forefoot and was examined in both axis. The second and third interspaces were negative for neuromas. There were no adventitious bursa sub metatarsals 2 - 4. The second, third, and 4th metatarsal shafts were negative for stress fractures. Imaging the 2nd, 3rd and 4 MPJ's revealed a plantar plate tear of the 2nd metatarsal phalan-geal joint. (Image below.) The below image is a longitudinal

view of one the medial plantar aspect of the 2nd MPJ. Note that when compared to the normal view of the 2nd MPJ (bottom right) the tendon is noted and therefore imaging in the center of the joint. Also note that in addition to the plantar plate tear (gap noted), it is clear that you can see the synovial fluid that has emanated (dark black anechoic area) from the joint. In the normal image one is able to delineate the borders of the flexor tendon and the borders of the plantar plate.

## Discussion: Forefoot pathology and Ultrasound

There are a number of soft tissue structures that may be involved with forefoot pain. Diagnostic ultrasound can provide a definitive diagnosis for neuromas, capsulitis, plantar plate tears, joint effusions, tendonitis / tendon tears, avulsion fractures of the base of the proximal phalanx, stress fractures, bursitis, cysts and many more causes of pain. Even more important, ultrasound allows for dynamic movement to observe pathology in motion. Diagnostic ultrasound is a tool that provides non-invasive point of care imaging for soft tissue pathology (and bone). Patients appreciate the fact that the clinician can provide imaging services during an office visit. Delaying a definitive diagnosis and referring patients for expensive invasive testing or MRI's delays a definitive treatment plan.

