Hindfoot Joint Pressure in Acute and Recurrent Sprains

Presenting Author:
Fabian Krause, MD – Berne, Switzerland

Additional Authors:
Stefanie Blatter
Dirk Waehnert, MD
Markus Windolf, MsC, Engineer
Martin Weber, MD

Hindfoot trauma including ankle and subtalar sprains may be followed by osteochondral lesions and persisting pain originating from posttraumatic arthrosis.

Acute and recurrent (consecutive ATFL, CFL, LTCL transection) hindfoot sprains were simulated in cadaver specimens. The effect on the migration of the center-of-force (COF) and on the tibiotalar and subtalar pressure at 700 N (acute) and 150 N (recurrent) axial static and dynamic loads was recorded using pressure sensors.

In the acute condition the peak pressure increase reached the level of significance in the ankle and in the subtalar medial facet. The ankle COF migrated significantly towards medial and posterior. In the recurrent condition the ankle and subtalar (medial facet) peak pressure increased significantly with intact ligaments and with all ligaments cut. The more ligaments were severed the lower the peak pressure during recurrent sprains was measured.

Acute hindfoot supination sprains with intact ligaments are more likely to cause medial OCL of the talar dome than subsequent sprains with incompetent ligaments. In the unstable hindfoot the impact of chronic asymmetric loading of the joint surfaces on consecutive medial ankle arthrosis would therefore appear more important than that of recurrent sprains.