ABSTRACT

**Background:** Tendon transfers and calcaneal osteotomies are commonly used to treat symptoms related to medial ankle arthrosis in fixed pes cavovarus. However, the relative effect of these osteotomies in terms of lateralizing the ground contact point of the hindfoot and redistributing ankle joint contact stresses are unknown.

**Methods:** A pes cavovarus with fixed hindfoot varus was simulated in eight cadaver specimens. The effect of three types of calcaneal osteotomies on the migration of the center of force and tibiotalar peak pressure at 300 N axial static load (half-body weight) were recorded using pressure sensors.

**Results:** A significant lateral shift of the center of force was observed: 4.9 mm for the laterally closing Z-shaped osteotomy with additional lateralization of the tuberosity, 3.4 mm for the lateral sliding osteotomy of the calcaneal tuberosity, and 2.7 mm for the laterally closing Z-shaped osteotomy (all \( P < 0.001 \)). A significant peak pressure reduction was recorded: -0.53 MPa for the Z-shaped osteotomy with lateralization, -0.58 MPa for the lateral sliding osteotomy of the calcaneal tuberosity, and -0.41 MPa for the Z-shaped osteotomy (all \( P < 0.01 \)).

**Conclusion:** This cadaver study support the hypothesis that lateralizing calcaneal osteotomies substantially contribute to normalize ankle contact stresses in pes cavovarus.

**Clinical relevance:** Extrapolating this cadaver study’s findings, varus hindfoot realignment may add to prevent the onset or progression of ankle arthrosis in pes cavovarus.

**Level of evidence:** 2c (biomechanical study)

**Key Words:** Hindfoot Varus; Joint Contact Stress; Realignment; Sensor Measurement