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Evaluation of the sagittal range of motion of the leg-foot after talocalcaneal arthrodesis

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Introduction: Subtalar arthrosis is a disabling condition that can significantly impair hindfoot mechanics and overall foot function. Talocalcaneal arthrodesis is a well-established surgical procedure for pain relief and stabilization; however, its impact on the sagittal range of motion of the leg-foot complex and on midfoot mobility remains unclear. Understanding these biomechanical changes is essential to better predict functional outcomes and guide clinical decision-making. The objective is to evaluate the influence of talocalcaneal arthrodesis on the sagittal range of motion of the leg-foot and mobility of the midfoot.

Methods: We evaluated leg-foot mobility in 12 patients who underwent talocalcaneal joint arthrodesis, pre- and post-surgery. Leg-foot mobility was measured by means of radiographic examination in profile view. Maximum dorsiflexion was achieved by asking the patient to step forward with the contralateral foot and perform as much dorsiflexion of the affected ankle as possible without lifting the heel off the ground. For maximum plantar flexion, the patient was asked to step back with the contralateral foot and achieve as much plantar flexion as possible without lifting the affected forefoot off the ground. We performed this radiographic sequence before surgery, after arthrodesis consolidation, and in the contralateral lower limb. We used the angle between the tibia and the ground to measure leg-foot movement and Meary's angle, traced on the long axis of the talus and first metatarsal bone, to evaluate the sagittal movement of the midfoot.

Results: Twelve patients with subtalar arthrosis were evaluated, seven males and five females, with a mean age at the time of surgery of 44.5 years. The mean follow-up time after arthrodesis was 38.8 months. All the arthrodeses consolidated. Considering the leg-foot sagittal movement, the mean preoperative value was 43.7°, postoperatively, 45°, and on the contralateral side, 57°. In the midfoot evaluation, the range of motion in the preoperative period was 3.6°, in the postoperative period, 7.1°, and on the contralateral side, 11.2°. Although, on average, midfoot mobility was lower than on the contralateral side used as a control, when we examined cases individually, we found that in five patients the mobility of the contralateral side was lower than that of the control side, and in seven it was higher. Due to this data, we cannot conclude the effect of subtalar arthrodesis on the midfoot movement.

Conclusion: Based on the radiographic evaluation performed in this study, both arthrosis and talocalcaneal arthrodesis reduce leg-foot range of motion. We cannot conclude as to the effect of this arthrodesis on midfoot mobility.

Keywords: Range of Motion, Articular; Ankle; Foot.

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