Pilot study of morphological and functional evaluation of adult flat foot by weight bearing CT and gait analysis before and after corrective surgery

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The adult idiopathic flat foot represents a very frequent condition, which afflicts a high percentage of population with different levels of severity and different clinical and functional consequences. This complex foot deformity includes morphological alterations in 3D: valgus of the hindfoot, flattening of the plantar arch and supination of the forefoot. From the functional point of view, flat foot is a syndrome characterized by multiple static and dynamic deformities with the prevalent pronation of the subtalar joint. This complexity explains difficulties in the evaluation of this syndrome and even today the wide debate on indications for surgical treatment and on morphological and functional outcomes.

Morphological weight bearing CT parameters and functional analysis (using "Gait analysis") can implement the evaluation of the flat foot. Weight bearing CT is useful to verify the severity of the 3D deformities typical of flat foot, while kinematic and kinetic variables of gait is able to quantify the functional improvements of the foot after surgery.

The objective of the study consists in morphological and functional evaluation of the adult idiopathic flat foot with a combination of weight bearing CT and "Gait analysis" before and after corrective surgery (arthrodesis of the subtalar joint according to Grice).

Weight bearing CT parameters: position of the calcaneus in 3D (with respect to talus, tibia, midfoot and forefoot) and medial longitudinal arch of the foot.
Gait Analysis parameters: spatio-temporal parameters, multisegmental kinematics of the ankle-foot complex (in coronal, transverse and sagittal planes), medial longitudinal arch and forces.

Clinical examination parameters: VAS of the foot, Foot Posture Index, Foot function Index.

These assessments are performed in a group of 20 patients recruited consecutively and candidates for surgery to correct the adult flat foot according to the Grice technique.

Evaluations are realized by weight bearing CT and by Gait analysis in the pre-operative phase and at a 6-months follow-up from the intervention.

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