Foot Kinematics Following Resection of Tarsal Coalition

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Summary:
Passive subtalar motion improvement does not reflect improved subtalar kinematics following resection of tarsal coalition.

Abstract:
Background:
While significant clinical improvement has been demonstrated in the majority of patients with tarsal coalition following bar resection, it is not clear whether subtalar kinematics is actually recreated, thus strengthening the rationale for this operation. The purpose of our study was to examine whether kinematic parameters of foot motion are normalized following bar resection.

Methods:
This study compared three groups: 9 candidates for resection of tarsal coalition, 9 patients between two and four years after bar resection, and 9 control subjects. Ankle hindfoot scoring was evaluated according to the AOFAS. Kinematical parameters of subtalar motion were evaluated during the stance phase of the gait cycle.

Results:
Significantly improved passive subtalar range of motion and AOFAS ankle hindfoot scoring were demonstrated post-operatively (P< .01). The kinematical analysis revealed no post-operative improvement of the restricted subtalar eversion-inversion motion observed during locomotion. Angular velocity of the subtalar motion was as well similar in both coalition groups, and was significantly increased compared with control. Kinematical analysis of foot motion in the sagital plain demonstrated improved motion post-operatively, which was comparable with control.

Conclusions:
Foot kinematics in tarsal coalition is not recreated following bar resection, despite the favorable clinical outcome observed.

Clinical Relevance:
Following resection of tarsal coalition, patients continue to be subjected to increased loading and torque in their subtalar and adjacent articulations. This may imply further deterioration of these joints in the long term. Future studies may examine whether additional operative procedures or rehabilitation protocols improve foot kinematics in these patients.