

Combined Anterior And Posterior Vs Isolated Posterior Facet Fixation For Subtalar Arthrodesis: A Proportional Meta-Analysis And Systematic Review Of The Literature

Orthopaedics / Foot & Ankle / Arthrodeses

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Background

Subtalar arthrodesis (SA) is a common procedure to treat end-stage degeneration of this joint when conservative measures have been exhausted. Multiple techniques have been described to achieve this (i.e., medial or lateral approaches, open or arthroscopic procedures, with or without bone graft), but near universally, fixation is achieved using large-diameter cannulated screws which leads to fusion in approximately 85-100% of cases. The majority of authors reporting on SA have used screws crossing the posterior facet of the joint, in the belief that indirect stabilization of the anterior and middle facets is achieved through posterior facet fixation, making an anterior direct stabilization unnecessary. However biomechanical studies have identified that positioning screws both posteriorly and anteriorly in the subtalar joint, through the use of an additional third anterior screw, significantly increases compression and torsional resistance at the fusion site.

Objectives

With this background, we systematically reviewed the literature in order to determine whether a combined direct fixation of both anterior and posterior facets during SA might influence the union and complication rate as compared to isolated fixation of the posterior facet. Our hypothesis was that a combined anterior and posterior fixation increases the union rate and reduces the risk of complications.

Study Design & Methods

: In this PRISMA-compliant PROSPERO-registered systematic review, we included studies reporting data after SA stabilized with screws in adults. The characteristics of the cohort, study design, surgical details, nonunion and complication rate at the longest follow-up were recorded. The modified Coleman Methodology Score (mCMS) was applied to appraise the quality of studies. Two groups were compared: an ANT/POST group (screws positioned both in the anterior and posterior facet) and an ONLY POST group (isolated posterior facet fixation).

Results

: Eighteen series (685 feet: ANT/POST=96, ONLY POST=589) were selected. The median follow-up was 28 months (IQR, 12-42). The pooled proportion showed a similar nonunion rate (6% vs 10%; $p=0.46$) and complication rate (14% vs 19%, $p=0.47$) in the ANT/POST group as compared to the ONLY POST group. The pooled proportion of reoperation was not different either (ANT/POST: 7% vs ONLY POST: 10%, $p=0.37$). Kernel regression suggested a correlation between the proportion of open/arthroscopic procedures and the nonunion rate ($p=0.025$) with a median nonunion rate at 10.9% and 5.9% for open and arthroscopic procedures, respectively. Mean CMS was 40.4 points (poor

quality).

Conclusions

This proportional meta-analysis suggested that a combined direct fixation of anterior and posterior facets during subtalar arthrodesis does not significantly influence the risk of nonunion nor affects the risk of complication and reoperation as compared to isolated posterior facet fixation.