Results of Spring Ligament Reconstruction Using Peroneal Autograft in the Treatment of Stage IIB Flexible Flatfoot Deformity

Presenting: Benjamin R. Williams, BS
New York, New York - williamsb@hss.edu
Scott Jacob Ellis, MD; Timothy Deyer, MD; Jonathan T. Deland, MD

Summary:
Spring ligament reconstruction with peroneus longus autograft leads to good clinical outcomes and maintenance of correction of severe adult flatfoot deformity. It was found to give correction intraoperatively when bony procedures fail to achieve adequate correction.

Abstract:
Introduction:
Compromise of the spring ligament and talonavicular joint capsule in patients with flatfoot deformity may contribute to worsening arch collapse and forefoot abduction not correctable by bony procedures. Only two reports in the literature describe reconstruction of the spring ligament: the first by plicating the posterior tibial tendon in a series of 6 patients (1) and the second using either the anterior tibial tendon or posterior tibial tendon stump (2) in 11 patients. The purpose of this study was to assess the results after spring ligament reconstruction using a peroneus longus autograft and bone tunnels, a technique previously not described in the literature.

Methods:
Twelve consecutive patients (12 feet, mean age 63.8 +/- 13) having undergone spring ligament reconstruction were assessed at a mean of 9.0 +/- 1.7 years after surgery. The decision to perform spring ligament reconstruction was made intraoperatively when talonavicular abduction persisted despite bony procedures such as a lateral column lengthening. Standard anteroposterior (AP) and lateral preoperative and postoperative flatfoot parameters were measured. The AOFAS, FAOS, VAS, pain to palpation, and ankle and triple joint complex range of motion were assessed. Complications, eversion strength, recurrent injuries, heel alignment, and single stance heel rise were also noted.

Results:
Preoperative to postoperative improvement was found in the talonavicular coverage angle, lateral first tarsometatarsal angle, AP tarsometatarsal angle, and calcaneal pitch (Table 1). The average postoperative AOFAS and FAOS scores were 91.08 and 85.15, respectively. Mean AOFAS improvement was 54.80 (p=0.063). Mean VAS was 2.62. No pain over the peroneal donor or graft recipient sites was found. Total ankle range of motion averaged 48.7° with the knee bent and 42.9° with the knee extended. The triple joint complex range of motion averaged 32.0°. No reconstruction site infections or nerve injuries were noted. All patients maintained normal eversion strength. No recurrent injuries were reported. All but one patient (6° valgus) maintained a neutral to slight valgus (3°) heel alignment. Eight patients were able to invert the hindfoot with a single stance heel rise. Two were able to perform a single stance rise with no inversion. Though the final two patients were unable to rise on one foot, they could perform a double heel rise with inversion.

Discussion:
Reconstruction of the spring ligament with peroneus longus autograft leads to good clinical outcomes and maintenance of radiographic correction of severe adult flatfoot deformity. This procedure with peroneus
longus, or perhaps allograft, should be considered in feet that lack sufficient correction of the talonavicular coverage with calcaneal osteotomies (i.e. medializing heel slide and lateral column lengthening) and represents an alternative to arthrodesis techniques in feet with considerable deformity.

References: