

SELECTIVE ARTHRODESIS OF THE SUBTALAR JOINT

David J. Caldarella, DPM

Alan S. Banks, DPM

The use of an isolated subtalar arthrodesis for pathology involving the talocalcaneal joint has been discussed for several decades. While no single study has confirmed a favorable or unfavorable result over a significant period of time, recent thoughts suggest that this procedure may be a suitable means of addressing subtalar pathology. Historically, many of the processes which affect this joint have been treated with a triple arthrodesis, regardless of whether or not the pathology involved the midtarsal joint. The authors will review pertinent literature regarding isolated subtalar fusions and provide criteria for use of this procedure as opposed to triple arthrodesis.

There are a wide variety of conditions which may require fusion of the subtalar joint. The diagnoses most commonly noted in those patients undergoing this surgery at this institution are post-traumatic arthrosis and talocalcaneal coalitions. The common denominator in each instance is either pain and/or instability of the rearfoot. Classically, the triple arthrodesis has been favored in such cases for a variety of reasons. However, from a more common sense standpoint, it does not seem necessary to fuse joints which are not involved with the pathology (ie, the midtarsal joint) if good overall function of the foot can reasonably be attained without adverse sequelae via a single arthrodesis. Leaving available motion at the midtarsal level will allow the foot more flexibility to adapt to ground reactive forces and uneven terrain. Hall and Pennal have reported that although midtarsal joint mobility is reduced following subtalar arthrodesis, 50% to 75% of the motion remains.

Provided the midtarsal joint is unaffected, the key factor which will determine whether a subtalar or a triple arthrodesis may be performed is the alignment of the foot. When rearfoot fusions are performed, the key is to place the heel in a slight valgus position with the forefoot perpendicular or in valgus relative to the rearfoot. Leaving either part in a varus alignment will usually result in a variety of symptoms such as may be encountered in any number of conditions which manifest with a fixed varus position of the foot. Therefore, the alignment of the forefoot should be neutral or valgus preoperatively if one is arthrodesing the subtalar joint alone. Patients with a forefoot varus or substantial medial column instability will require triple arthrodesis.

Proponents of the triple arthrodesis have argued that the subtalar/midtarsal complex functions as a unit and that isolated fusion of one of the parts will render undue stress to the others thereby favoring subsequent arthrosis. Some authors have noted degenerative changes in these adjacent joints following subtalar fusion and speculated that these could become problematic (Fyermers, et al.). However, in reviewing patients on average seven years postoperatively, Noble and McQuillan concluded that degenerative changes at this level did not occur or were of no clinical significance.

In particular, talar beaking has been noted by a number of authors following talocalcaneal arthrodesis. In a long-term follow-up of Grice procedures, Ross and Lyne reported that 60 of 71 patients (84.5%) demonstrated talar beaking. Harris and colleagues reported this finding in patients following subtalar fusion for intra-

articular calcaneal fractures. However, talar beaking was noted to be virtually asymptomatic and of little clinical significance.

Talar beaking of this nature is not necessarily a sign of degenerative arthrosis, but rather due to traction from the dorsal talonavicular ligaments. The exact relationship of this finding and its potential to create symptomatic problems has yet to be delineated, although the evidence to date seems to indicate that there is little cause for concern. However, a key factor to discuss, and one which has not been addressed, is how does the position of the foot following fusion relate to talar beaking? It is possible that other authors have not appreciated the positional relationships necessary to optimize the result, thereby predisposing the patient to abnormal stresses?

More recently, Mann, et al., have noted good results in four patients undergoing subtalar arthrodesis for middle facet coalitions. The authors' experience has been similar in that isolated fusion has been successful in completely eliminating the pain association with the coalition.

Patients who have post-traumatic arthrosis following fractures of the talus or calcaneus may do well with this approach. However, if the fracture propagated into either of the midtarsal joints, then a triple arthrodesis is usually preferred. Another consideration in patients who have suffered intra-articular calcaneal fractures is the amount of joint depression. Following resection of the joint surfaces one may find that bone graft material is necessary to maintain the elevation of the talus. Otherwise, one may encourage incongruity at the talonavicular level.

The authors have been pleased with their experience in the use of subtalar arthrodesis for isolated talocalcaneal pathology. To date over 20 patients have undergone the procedure at this institution for a variety of problems. Although the early results are quite good, more meaningful data will be available when a substantial number of patients are able to be reviewed at a longer postoperative interval, preferably ten years or more.

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