

SUBTALAR ARTHROEREISIS IN THE OLDER PATIENT

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INTRODUCTION

Arthroereisis is a surgical procedure designed to limit the motion of a joint. Subtalar joint arthroereisis has been used for more than 60 years. The main indication for the procedure is to control excessive pronation of the subtalar joint commonly seen in flexible pes valgus. The original use or indication for the procedure was for symptomatic pediatric flatfeet. In the last 10-15 years, the indications have expanded somewhat to include adult acquired flexible flatfeet.

CONTROVERSY

Surgical correction of the adult acquired flatfoot is one of the most debated topics in podiatric surgery. It is my feeling that most foot surgeons will not consider subtalar joint arthroereisis in the adult population and feel that realignment osteotomies, tendon transfers, and/or joint arthrodesis procedures are preferred. There is no right or wrong answer. Everything generally boils down to what works in your hands and what is best for your patient.

INDICATIONS

The main prerequisite for subtalar joint arthroereisis in the treatment of pes valgus is hindfoot flexibility. If the flatfoot can be manually reduced to a neutral position, then arthroereisis can be employed. Otherwise, if the hindfoot has valgus adaptation and is rigid, then the implant will do nothing to realign the hindfoot. Moreover, if there is excessive forefoot varus/supinatus after the heel is neutral, then additional surgeries on the medial column may be required to address that part of the deformity.

Rarely is subtalar joint arthroereisis done as a stand-alone procedure. Typically I look at 3 areas to address in the flatfoot: the equinus, hindfoot valgus, and forefoot position once the heel is neutral. Subtalar joint arthroereisis can really only address the hindfoot position and the forefoot to a lesser extent. At the very least, the associated equinus needs to be addressed with a gastrocnemius recession or tendo-Achilles lengthening. Adults, unlike children, may have accompanying arthritis in the midfoot from compensation or have serious joint faults that need to be addressed as well. If the medial column is not stable, then even though the hindfoot may be in better position

following arthroereisis, the medial column will continue to break down contributing to the flatfoot deformity and dysfunction.

CASE REPORTS

CV is a 51-year-old woman who was referred for chronic ankle pain on the left side. She had prior treatment that included bracing, foot orthotics, and nonsteroidal anti-inflammatory drugs. She had ankle radiographs already taken and she had them for me to review. Her examination was remarkable for a collapsing pes valgus foot type (Figure 1). She had pain in the medial ankle and midfoot with palpation. She had an intact posterior tibial tendon with only mild weakness noted with a single limb toe rise. She had a flexible hindfoot. Her gait examination was remarkable for a too many toes sign (Figure 2). Her ankle radiographs were unremarkable, however, foot radiographs revealed a pes valgus foot type with peritalar subluxation and with degenerative joint disease of the first tarsometatarsal joint (Figures 3,4). She underwent a gastrocnemius recession, subtalar joint arthroereisis, and first metatarsocuneiform joint arthrodesis. Her post-operative course was unremarkable. She went on to a successful fusion and had resolution of pain. Her clinical examination and radiographs revealed better alignment of the foot (Figures 5-7).

HA is a 71-year-old woman referred to me for surgical consideration for left tibialis posterior tendon dysfunction. She had extensive conservative treatment by her referring podiatrist. She was ambulating with a podiatric ankle foot orthosis. She had magnetic resonance images that were consistent with a partial rupture and tendinosis of the posterior tibial tendon. Her physical examination was remarkable for edema along the medial ankle in the course of the posterior tibial tendon. There was pain with palpation on the course of the posterior tibial tendon. Weakness of the tendon was noted with manual muscle testing. She was unable to perform a single limb toe rise. Her radiographs were remarkable for peritalar subluxation and early degenerative joint disease of the second tarsometatarsal joint (Figures 8-9). Clinically, she had no pain at the second metatarsocuneiform joint and therefore we decided not to fuse the joint. Her surgery consisted of a gastrocnemius recession, subtalar joint arthroereisis, and secondary repair of the posterior tibial tendon with a flexor digitorum longus



Figure 1. Preoperative clinical appearance illustrating a collapsed arch on the patient's left foot.



Figure 2. Preoperative clinical appearance illustrating heel valgus and a too many toes sign.



Figure 3. Preoperative AP radiograph. Note peritalar subluxation and arthrosis of the first metatarsocuneiform joint.



Figure 4. Preoperative lateral radiograph. Note plantar flexion of the talus with anterior break of the Cyma line.



Figure 5. Postoperative clinical photo. Note better heel position and less abduction of the forefoot.



Figure 6. Postoperative clinical photo revealing good alignment.

transfer/augmentation (Figures 10-12). Her postoperative course was unremarkable. She was happy with the results of the surgery and was able to return to her regular activities without the need for a brace.

KG is a 69-year-old woman who was referred to me with a flexible flatfoot deformity. She had been treated conservatively and was ambulating in a podiatric ankle foot orthosis on the left side. Her main symptoms included weakness and fatigue in her foot. She had only mild reports of pain. She did relatively well wearing a brace, but wanted to wear other shoes besides sneakers. Her main desire was to wear regular shoes without a brace. Her examination was consistent with medial arch collapse on weight bearing (Figure 13). She had mild pain along the course of the posterior tibial tendon and was unable to do a single limb toe

rise. She had a gastrocnemius equinus. Her radiographs were remarkable for peritalar subluxation. No significant arthrosis was noted (Figures 14-15). Surgery included a gastrocnemius recession and subtalar joint arthroereisis. Postoperatively she had no complications. Her postoperative radiographs revealed better position of the foot (Figures 16-17). She eventually returned to shoes and was able to wear shoes without a brace as she desired.

DISCUSSION

Subtalar joint arthroereisis is not intended for every patient with a symptomatic flatfoot deformity. In fact, the indications are quite limited over all. I tend to offer this technique to patients who may not be good candidates for



Figure 7. Postoperative lateral radiograph. Note better position of the talus and normal Cyma line.



Figure 9. Preoperative lateral radiograph. Note degenerative joint disease of the second metatarsocuneiform joint that was not clinically relevant.



Figure 8. Preoperative AP and oblique radiograph consistent with pes valgus. Note peritalar subluxation.



Figure 10. Postoperative AP and oblique radiographs that reveal better talonavicular joint congruency.



Figure 11. Postoperative lateral radiograph. There is still an anterior break in the Cyma line with residual valgus; however, the patient was happy with the results despite having residual valgus.



Figure 12. Clinical posterior view of the patient 8 weeks following surgery.



Figure 13. Clinical posterior view depicting the too many toes sign on the left foot.



Figure 14. Preoperative AP radiograph consistent with collapsed pes valgus.



Figure 15. Preoperative lateral radiograph. Note the severe declination of the talus.



Figure 16. Postoperative AP and oblique radiograph. Better alignment of the talonavicular joint is seen.



Figure 17. Postoperative lateral view. Dorsiflexion of the talus is noted.

a reconstructive surgery. For example, subtalar joint arthroereisis may be a better choice for the elderly patient that cannot be nonweight bearing for 6-8 weeks for a fusion or realignment osteotomy. Moreover, the procedure may be beneficial in the patient that has a milder deformity that may not need extensive surgery.

The most important part of perioperative planning is the preoperative discussion and informed consent process. I will start the conversation describing the flatfoot condition as a pathology affecting the foot. Different ways to surgically address the flatfoot are reviewed. Arthrodesis, calcaneal osteotomies, tendon transfers, and augmentations are discussed. If the patient is suitable for subtalar arthroereisis, then I will discuss what the surgical technique is and its benefits and limitations. The following is an outline of salient points that I cover with my patients who are considering the procedure:

Pros

- 1) Minimally invasive.
- 2) Normal anatomy (bones, joints, tendons, etc.) is not altered.
- 3) If the implant is not tolerated or the surgery does not work to resolve their complaints, then the implant can be removed and no bridges have been burned. A reconstructive approach can then be considered.
- 4) Early return to weight bearing and wearing a shoe following surgery (depending on whether or not ancillary procedures are done).
- 5) No risk of non-union or malunion of the foot.
- 6) Quicker surgery time.
- 7) Technically non-demanding.

Cons

- 1) There is usually a persistent flatfoot after surgery. It is necessary to discuss with the patient that most likely they will still have a “flatfoot” albeit less of a deformity. This is when I reiterate with the patient that not all flatfeet are painful. If the operative flatfoot can be more stable, less painful, and function better despite it still being somewhat flat, then in my mind that is a success. We are our own worst critics when evaluating our postoperative results. We are concerned about pain resolution, better

radiographic position, and clinical appearance. Patients with this particular pathology are generally only concerned about pain resolution.

- 2) Subtalar arthroereisis is rarely done as a stand-alone procedure and will most times require a concomitant gastrocnemius recession and possible medial arch work (medial column fusion, tendon repair/augmentation, etc). If the patient is going to be nonweight bearing following tendon repair or a calcaneal osteotomy, then the advantage of early weight bearing following subtalar arthroereisis is minimized. I am less likely to recommend the arthroereisis technique if I have to immobilize the patient for 6 weeks.

- 3) Adults do not tolerate the implant as well as children. Discussion on sinus tarsi pain following the procedure is addressed. Moreover, I tell patients that it is not uncommon to need a cortisone injection into the sinus tarsi, which generally occurs about 3 months following the procedure.

- 4) I have some final thoughts on the topic of posterior tibial tendon dysfunction. When I first started doing the subtalar joint arthroereisis technique, I felt it was unnecessary to address the tendon pathology. I would explain to the patient that the tendon is no longer necessary due to the implant. Now, I generally repair the tendon in addition to subtalar joint arthroereisis. The general plan is to inspect the tendon and if there is pathology such as tendinosis, split tears, or frank ruptures, then those will be fixed by a combination of radiofrequency coblation, tubularization with side to side repair, and/or flexor digitorum longus transfer if the posterior tibial tendon is not salvageable.

My rationale for that is if for any reason, if the older adult cannot tolerate the implant and I need to remove it, then at least the tendon is repaired. There have been times where I have had to remove the implant due to sinus tarsi pain. In those few instances, pain resolved after the implant was removed and no further surgery was necessary due to lack of symptomatology. Generally, what I recommend is to have the implant removed and see what happens. If there is continued pain and dysfunction, then we revisit the idea of a reconstructive surgery.

Just remember that communication with your patient regarding the expected outcome, need for further surgery, or just failure of the surgery is critical. In cases where the arthroereisis surgery did not work to resolve my patient’s symptoms, they were not upset, but rather the contrary as they were grateful that we at least tried the more conservative option. In cases where the surgery was successful, I have had so many patients tell me that they would be happy to talk to prospective patients considering the surgery to let them know how easy the surgery was and were relieved not to have bones cut, moved, or fused.