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Current Concepts In Flatfoot Correction

In a discussion of flatfoot surgery at the Western Foot and Ankle Conference, these panelists delved into the finer points of procedure selection with a focus on double and triple arthrodesis, and soft tissue procedures.

By Brian McCurdy, Managing Editor

The symptoms of flexible flatfoot include pain in the medial arch and lateral hindfoot, deformity, and potential disability in terms of its impact on activity and employment. Slightly tweaked. OK as is?///

Dr. Neagu notes flatfoot is a continuum, saying as the condition develops, the posterior or tendon weakens, peroneal tendons take over and the tibialis anterior tendon///. Added this. Check this///

Dr. Neagu says the ideal flatfoot classification would take into account the stages of pathology and the corresponding treatment approaches. He notes the classification should be reliable, predictable and reproducible. Dr. Neagu says clinicians should consider if the flatfoot deformity is reducible in nature, if there is a soft tissue imbalance, the level of deformity and the presence of degenerative joint disease.

Determining the level of the flatfoot deformity is essential or the correction will be suboptimal, according to Dr. Neagu. He notes proximal to distal correction will allow surgeons to spare motion///. Need to clarify this a bit more///. One should correct bone before balancing soft tissue except when the foot is in equinus. ///In cases of concomitant equinus, Dr. Neagu says one should balance soft tissue first///. Slightly tweaked. OK as is///.

Correction as it is challenging to control ///in the middle///. A bit unclear. Need to specify this a bit more///. He notes tendon balancing follows bone work///. Is this specifically referring to cases of medical column instability or is this a more general point?///

As the profession’s understanding of flatfoot is evolving, Dr. Neagu says surgeons should expect new procedures to emerge. He emphasizes that there is not a huge difference between ///procedures///. Can we rephrase as follows: “surgical procedures for flatfoot deformity correction”///.

Assessing The Efficacy Of Double And Triple Arthrodesis For Flatfoot

Triple arthrodesis is indicated for severe ///deformity///. OK as is or can we specify as “flatfoot deformity” here///. Painful degenerative joint disease, severe instability, and spasticity and neuromuscular disease, according to Shannon Rush, DPM, FACFAS. He notes that triple arthrodesis is a time-tested technique for stabilization and realignment that offers predictable results and fusion rates. However, Dr. Rush cites several disadvantages, such as a risk of undercorrecting flatfoot, ankle arthrosis, lateral wound issues and cost of the implant. ///In regard to the ///dual approach///. OK as is or can we say “double arthrodesis” here instead///?/// to varus deformity, Dr. Rush notes that undercorrection with non-union of valgus feet and problems with lateral soft tissue has led surgeons to seek out different treatment options. ///OK as is///

Dr. Rush notes a medial double arthrodesis, consisting of subtalar and talonavicular joint fusions, is indicated for stages III and IV flatfoot, severe lateral peritalar subluxation, lateral soft tissue contracture, posterior tibial tendon repair and flexor digitorum longus tendon///. Added this. OK as is///.

In a study focusing on the medial approach to subtalar fusion, he says exposure permitted direct visualization of all three subtalar facets.1 With the medial approach, he says one can easily correct several degrees of hindfoot valgus through medial bone resection and medial translation of the calcaneus.

In a study of 77 patients, Hyer and colleagues compared the frequency and severity of ankle valgus after the medial double arthrodesis with the frequency after triple arthrodesis.2 Dr. Rush notes the odds of an increase in the valgus ankle angle for those who had a triple arthrodesis were 3.64 times higher than for those who had a double arthrodesis.

Weinraub and colleagues reviewed the records of 45 patients with hindfoot deformities who had an isolated medial incisional approach for subtalar and talonavicular joint arthrodesis, and they found it was an effective alternative to triple arthrodesis.3 Dr. Rush notes that only one patient experienced pain in the calcaneocuboid joint and no patients had ankle valgus.

Surgical exposure for the ///medial incisional approach///. OK as is///
cludes a circumferential release of the talonavicular joint, according to Dr. Rush. He advises accessing the subtalar joint beneath the talar head, releasing the sinus tarsi and releasing the lateral subtalar joint capsule. Dr. Rush cautions against dissecting the deltoid ligament, warning of potential instability and that dissection can damage the blood supply to the talus.

Anand and colleagues focused on 18 feet with posterior tibialis dysfunction that had malalignment correction via a two-incision triple arthrodesis. Although the authors found a union rate of 89 percent, Dr. Rush says the authors did not recommend the approach as an alternative to the triple arthrodesis. In a cadaver study, Resnick and coworkers determined that a medial displacement calcaneal osteotomy combined with a triple arthrodesis may be effective when one cannot position the hindfoot properly.5 Dr. Rush adds that there should be no need to cut and medialize the heel if the surgeon properly performs the subtalar joint fusion from the medial side.

Isolated medial approach double arthrodesis has changed the narrative in hindfoot reconstruction, notes Dr. Rush. He notes that this arthrodesis slightly tweaked. OK as is?///Slightly tweaked. OK as is?/// seems to be a better option for valgus degenerative feet and reduces deltoid ligament strain and secondary ankle valgus. /// Dr. Rush adds that residual lateral column problems have not proven to be a concern with this procedure///Slightly tweaked. OK as is?///

A Closer Look At Soft Tissue Procedures

Are soft tissue procedures effective for flatfoot, particularly in the long term? Harry Schneider, DPM, notes that in a survey of 104 podiatrists, Hiller and Pinney indicated that surgeons used a wide variety of treatments for stage II adult-acquired flatfoot with most saying they used a combination of bony and soft tissue procedures that preserved the subtalar and talonavicular joints.6

In a study of 12 patients, Rosenfeld and colleagues found that after excision of the posterior tibial tendon, there is greater hypertrophy of the flexor digitorum longus tendon than if surgeons leave the tendon attached.///Slightly tweaked. OK as is?/// The authors concluded that transfer of the flexor digitorum longus tendon///Added this. OK as is?/// and a medial displacement calcaneal osteotomy produce a satisfactory improvement in hindfoot function. Dr. Schneider notes that the outcome was the same whether the posterior tibial tendon///Slightly tweaked. OK as is?/// remained intact or not.

In a study of 12 cadavers, Dr. Schneider says Kitaoka and coworkers found deltoid ligament reconstruction more effectively restored arch alignment in flatfoot in comparison to flexor digitorum longus tendon transfer, although the authors noted they did not support the clinical use of deltoid ligament reconstruction.8

Dr. Schneider notes that flexor digitorum longus///tendon?///added this. OK as is?/// transfer with medial displacement calcaneal osteotomy preserves the majority of subtalar motion and 26 patients could perform a sin-
gle-leg toe rise in a related study by Guyton and colleagues.9

A study by Wacker and colleagues focused on 44 patients with classical stage II tibialis posterior tendon dysfunction who had a medial displacement calcaneal osteotomy and flexor digitorum longus tendon transfer.10 Dr. Schneider notes that the patients’ American Orthopaedic Foot and Ankle Society (AOFAS) Ankle–Hindfoot score improved from 48.8 preoperatively to 88.5 at five-year follow-up.

In a study of 31 patients with stage II posterior tibial tendon dysfunction with a mean 15-year follow-up, Dr. Schneider says Chadwick and colleagues found flexor digitorum longus tendon transfer and calcaneal osteotomy facilitated long-term pain relief and satisfactory function.11

References
Doug Richie Jr., DPM, FACFAS, notes that the typical presentation of adult-acquired flatfoot is unilateral painful flatfoot in females over age 50. He notes patients will experience chronic arch pain and the arch has collapsed or flattened. As for the pathomechanics of flatfoot, he notes the presence of an increased gliding resistance of the posterior tibial tendon. Dr. Richie says an everted hindfoot unlocks the midtarsal joint during midstance, terminal stance and heel rise. Furthermore, he notes increased strain on supportive ligaments and the tibialis posterior tendon.

How can physicians accurately measure flatfoot on radiographs? Dr. Richie cites data by Younger and coworkers noting that the talar-first metatarsal angle can accurately identify patients with symptomatic adult flatfoot.1 He says Meary’s angle is the most reliable method to detect flatfoot or differentiate symptomatic from asymptomatic flatfoot.

In a study of 17 patients who had tibialis posterior tendon transfer, Dr. Richie says Yeap and colleagues focused on post-op signs of tibialis posterior tendon dysfunction.2 The authors found that eight patients had Grade 4 or better power of the ankle joint (MPJ) pathology and hallux limitus.

By Brian McCurdy, Managing Editor

In a discussion of biomechanics at the Western Foot and Ankle Conference, these podiatric physicians focus on biomechanical considerations with flatfoot, patients with diabetes, second metatarsophalangeal joint (MPJ) pathology and hallux limitus.

What The Literature Reveals About Biomechanical Considerations In Patients With Diabetes
Lawrence Lavery, DPM, stresses paying special attention to biomechanics in patients with diabetes.

“We are so foot-centric, we don’t take two steps back and look at the whole biomechanical chain of events,” says Dr. Lavery.

As Lavery and Gazewood noted in a 2000 study, the first step to prevent lower extremity ulcers is establishing a systematic foot examination and risk stratification to select patients for more intensive prevention efforts.7

Which biomechanical factors can lead to diabetic foot ulcers? Masson and colleagues examined 38 patients with diabetes and 37 patients with rheumatoid arthritis who had similar clinical abnormalities in the lower extremity.8 Dr. Lavery says the authors noted 32 percent of patients with diabetes had a history of planar ulceration in comparison with none in the rheumatoid arthritis group. However, he says those with diabetes had considerably more pain relief and foot function benefits from orthoses, eccentric and concentric progressive resistive exercises.

Doug Richie also notes the significant involvement of the spring ligament in flatfoot. Williams and colleagues conducted a retrospective review of radiographs and magnetic resonance imaging (MRI) of 161 patients.3 Dr. Richie says authors found that MRI-defined abnormalities of the spring ligament complex may be of at least equal importance to tibialis posterior dysfunction in indicating a moderate to severe radiographic planovalgus foot position.

In a study of eight cadavers, ///Hintermann and coworkers discovered that release of lateral ligaments results in partial mechanical disconnection of the foot from the tibia via additional transection of the medial ligaments.///Slightly tweaked. OK as is?/// according to Dr. Richie.4 He notes that the foot becomes further disconnected after transection of the subtalar interosseous ligament.

Are orthoses and resistance exercises effective in treating tibialis posterior tendinopathy? Dr. Richie notes that Kulig and colleagues, in their study of 36 patients with stage I or II tibialis posterior tendinopathy, found that patients received
severe neuropathy with a similar frequency of elevated plantar pressures in comparison with those with rheumatoid arthritis. Dr. Lavery says the study suggests high plantar pressure alone is not a direct cause of ulceration.

Similarly, Dr. Lavery cites a study of 64 patients by Fernando and colleagues investigating how limited joint mobility causes abnormal foot pressures and foot ulceration. The authors found that limited joint mobility may be a major factor in causing abnormally high plantar foot pressures. Dr. Lavery adds that the study found abnormal plantar foot pressures alone do not lead to foot ulceration and limited joint mobility contributes to foot ulceration in the susceptible neuropathic foot.

Dr. Lavery cites a study by Quebe deaux and colleagues noting that amputating the great toe is a factor in the development of second and third toe deformities and lesser MPJs, and a factor in new ulcer formation in patients with diabetes. The study notes that when deformities were present, the second and third toes and second MPJ deformities were more severe in feet that had great toe amputation.

In a study of 1,666 patients, Lavery and colleagues focused on the efficacy of dynamic plantar pressure assessment in determining which patients were at a high risk for neuropathic ulceration. The study notes that although elevated foot pressure is an important risk factor for foot complications, foot pressure alone is a poor tool to predict foot ulcers.

How does activity factor into the development of neuropathic foot ulcerations in patients with diabetes? Utilizing a high capacity continuous computerized activity monitor, Armstrong and colleagues assessed 100 consecutive people with diabetic neuropathy, deformity and/or a history of lower extremity ulceration or partial foot amputation. Dr. Lavery says eight patients developed ulcerations during the average evaluation period of 37.1 weeks and activity monitors showed average daily activity was significantly lower in individuals who ulcerated in comparison with individuals who did not develop ulcers, although the quality of activity was varied. The study authors suggested that modulating the “peaks and valleys” of patient activity could help reduce ulcer risk in the high-risk population.

Malif and Mueller compared the amount of weightbearing activity and estimates of cumulative plantar tissue stress in patients with and without diabetes and a history of recurrent plantar ulcers. Dr. Lavery notes patients with diabetes and a history of recurrent plantar ulcers were 46 percent less active.
than those without diabetes, accumulating 41 percent less daily stress on the forefoot than patients without diabetes and those with diabetes without a history of plantar ulcers.

In a study of 400 patients with diabetes and a history of foot ulcers, Lemaster and coworkers found increased weight-bearing activity did not increase the risk of foot reulceration.14

In a study of 79 patients, Lemaster and colleagues studied interventions such as leg strengthening and balance exercises, a graduated, self-monitored walking program, and motivational telephone calls every two weeks in patients with diabetes.15 Dr. Lavery says the authors concluded that promoting weight-bearing activity did not lead to significant increases in foot ulcers.

A Closer Look At Addressing Second MPJ Pathology

Conservative management of the second MPJ works best when one can identify the pathology early, according to Denise Freeman, DPM. ///She says information from the biomechanical exam will be helpful in writing the orthotic prescription and taking appropriate steps to correct any associated deformity, take pressure off the metatarsal heads and prevent hyperextension of the MPJ.///Slightly tweaked. OK as is?///

Dr. Freeman outlines six ways to take force off the metatarsal heads.

Inverted position cast build. Inversion increases orthotic arch height, transfers force from the metatarsal heads to the arch and decreases the everted position of the rearfoot. Dr. Freeman recommends 2 degrees of inversion.

Minimal cast fill. Dr. Freeman recommends 23 mm. She notes minimal cast fill produces an orthotic that conforms to the arch of the foot and transfers pressure from the metatarsal heads to the arch.

Wide orthotic width. A wide orthosis, notes Dr. Freeman, will increase the surface area under the arch and aids in transfer of force.

No distal bevel on plate. This increases the thickness of the distal edge and transfers force from the metatarsal heads to the metatarsal necks.

Metatarsal pads. Dr. Freeman says metatarsal pads transfer force off the metatarsal heads and MPJs. She recommends placing the pad proximal to the metatarsal heads.

Forefoot extension. A forefoot extension will provide cushioning under the metatarsal heads and Dr. Freeman says it will also lower the force under the metatarsal heads by decreasing the velocity at forefoot contact.

What You Should Know About The Biomechanics Of Hallux Limitus

Hallux limitus results from jamming of the first MPJ, says Dr. Freeman. In the clinical exam, she says one should look for what is causing increased force under the first ray. She also suggests four ways to achieve first ray plantarflexion.

Denise Freeman, DPM, says metatarsal pads, such as this, transfer force off the metatarsal heads and MPJs. She recommends placing the pad proximal to the metatarsal heads.

The advantages of plaster casting are that the STJ is neutral, one can cast out supinatus and can evaluate the cast quality, according to Dr. Thoms. She notes downsides of plaster casting, including that it is technically difficult, time-consuming and messy.
Inverted positive cast build. Dr. Freeman notes this will increase arch height under the base of the first metatarsal and plantarflex the first metatarsal. She recommends 2 degrees of positive inversion.

Minimum cast fill. With minimal cast fill, the orthotic will conform to the arch and one can prevent arch collapse and plantarflex the first ray.

Wide width orthosis. Dr. Freeman says a wide device will prevent arch collapse and plantarflex the first ray.

Reverse Morton’s extension. Dr. Freeman says a reverse Morton’s extension will improve first ray plantarflexion and also support metatarsals two through five. She recommends 1/8-inch of Korex behind the distal aspect.

Dr. Freeman also recommends three ways to decrease the everted heel position.

Deep heel cup. The heel cup should be a minimum of 18 to 20 mm and Dr. Freeman says it will control the heel in the contact phase of gait.

Rearfoot post. A rearfoot post will stabilize the orthosis in the shoe and also establish rearfoot positioning and motion at heel strike. She recommends a flat posting with cork.

Medial heel skive. Dr. Freeman recommends a 4 mm heel skive. She says this will increase the force medial to the subtalar joint axis to decrease excessive subtalar joint pronation and heel eversion.

Comparing Plaster And Digital Casting
When casting orthoses, Tanya Thoms, DPM, says the patient position should be subtalar joint neutral with a locked midtarsal joint and one should cast out supinatus. For cast evaluation of the plantar surface, she advises that the lateral border should be straight and the STJ should be neutral. The posterior surface should be dorsiflexed. The advantages of plaster casting are that the STJ is neutral and promote MTJ //missing words///, one can cast out supinatus and can evaluate the cast quality, according to Dr. Thoms. She notes downsides of plaster casting, including that it is technically difficult, time-consuming and messy.

As for digital casting, Dr. Thoms cites advantages including that it takes less of the physician’s time and offers high intrarater and interrater reliability. As for disadvantages of digital casting, she says there can be potential technical difficulties, it is difficult to position the foot and one cannot physically evaluate the cast.

Carroll and colleagues compared plaster versus digital casting in 21 patients.16 Dr. Thoms says they found intrarater reliability of 0.3 to 0.99 for plaster casting in comparison to 0.81 to 0.99 for digital casting. The study found interrater reliability of 0.57 to 0.99 in plaster casting in comparison to 0.81 to 0.99 in digital casting.

In contrast, in a study of 22 patients, Dr. Thoms says Telfer and colleagues compared plaster casting with foam boxes and three positions of digital scanning.17 The study found an intrarater reliability of 0.3 to 0.99 for plaster casting in comparison to 0.81 to 0.99 for digital casting. Carroll and colleagues compared plaster versus digital casting in 21 patients.16 Dr. Thoms says they found intrarater reliability of 0.3 to 0.99 for plaster casting in comparison to 0.81 to 0.99 for digital casting. The study found interrater reliability of 0.57 to 0.99 in plaster casting in comparison to 0.81 to 0.99 in digital casting.

In regard to cost, Dr. Thoms says Payne found plaster casting cost between $27.94 and $49.60 in comparison to a range of $3.30 to $10 for digital casting (in Australian dollars).18 //reference OK as is// Additionally, it’s not clear what the cost is referring to. Are we talking about the cost of a single orthotic or a pair of orthotics? She says the study did not account for the material costs for digital scans or the postage costs.

Dr. Thoms notes an iPad scanner costs $500 and requires a distance of 7.5 inches from the foot to scan. She notes an XYZ Printing Scanner costs $200 and one needs to hold it 4 inches from the foot to scan.

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Rethinking Strategies For Forefoot Surgery

Which procedure is most effective for hallux valgus and which can lead to bunion recurrence? What is the best approach to plantar plate tears? How can surgeons rectify iatrogenic forefoot complications? Lecturers offered their insights at the Western Foot and Ankle Conference.

By Brian McCurdy, Managing Editor

Surgeons have a myriad of choices for hallux valgus surgery. Paul Dayton, DPM, acknowledges the “very high variability” in the evaluation and management of bunions. He says there are well over 100 procedures for hallux valgus and surgeons rarely agree on the most effective technique. ///Dr. Dayton says podiatric physicians are likely to select procedures based on repetitiveness and training, but that does not ensure that the basic reasoning behind the procedure selection is not flawed./// Slightly tweaked. OK as is?///

Dr. Dayton notes that the outcomes of popular procedures are inconsistent, citing recurrence following metatarsal osteotomies of all types. Specifically, Iyer and colleagues related a high rate of hallux valgus recurrence in 17 patients having proximal medial opening wedge osteotomies.1 Dr. Dayton says the authors attributed recurrence to greater preoperative deformity and an increased preoperative distal metatarsal articular angle. In a study of 100 patients who had a distal chevron osteotomy, Dr. Dayton says Pentikaninen and coworkers found long-term bunion recurrence to be very common.2

Furthermore, Dr. Dayton cites a study by Okuda and colleagues noting a significant relationship between the round lateral edge of the first metatarsal head and hallux valgus.3 The authors conclude that a positive round sign after a proximal first metatarsal osteotomy can be a risk factor for bunion recurrence. Bock and colleagues focused on 93 patients that had a scarf osteotomy, following up at an average of 124 months.4 Harry Schneider, DPM, notes that the median American Orthopaedic Foot and Ankle Society (AOFAS) score improved from 57 to 95 but bunion recurrence was 30 percent in 93 patients. Pull Quote

In a study of 53 feet in 51 patients, Choi and colleagues found the scarf osteotomy to be a reliable correction technique for moderate to severe hallux valgus with low rates of complication or recurrence, notes Dr. Schneider.5

Dr. Dayton points to a fundamental deficiency in that the algorithms for procedure selection /// for hallux valgus?/// Added this. OK as is?/// are based on a two-dimensional radiographic report of anatomy. He emphasizes that two-dimensional X-rays do not correlate with triplane anatomy. /// In some cases on X-rays, he says physicians may see sesamoids as displaced in the transverse plane when in reality they are aligned and in their groove as one can see on a triplane view./// Slightly tweaked. OK as is?///

Kim and colleagues noted that 166 feet in 138 patients with hallux valgus deformities had a more pronated first metatarsal in comparison with 19 control feet.6 Dr. Dayton says the authors suggested it may be beneficial to use a computed tomography (CT) axial view in assessing hallux valgus deformity.

Furthermore, Dr. Dayton stresses there is an incomplete understanding of the triplane anatomy of the first ray. He says surgeons have for the most part focused on the transverse and sagittal planes of bunion deformity.

To restore the anatomy /// in hallux valgus cases?/// Added this. OK as is?/// Dr. Dayton says podiatric surgeons must restore the axis of alignment in three planes. If one leaves the sesamoid rotated and displaced, he notes lateral forces on the hallux and the medial buckling of the metatarsal are maintained. Triplane correction at the center of rotation of angulation may be the answer for addressing both recurrence and hallux valgus prevention, according to Dr. Dayton. With that correction, he says one may no longer need to rely on soft tissue balancing.

Geng and coworkers noted that despite the medial shift of the first metatar-
sal in hallux valgus, the lateral sesamoid retains its relationship to the second metatarsal in the transverse plane. Slightly tweaked. OK as is? He notes that the study authors refer to the lateral sesamoid’s apparent lateral movement as a “radiographic misinterpretation” and that increased awareness of this could help improve surgical outcomes. Slightly tweaked. OK as is?

Is a lateral release necessary for all bunions? Most of the time, Dr. Schneider says surgeons can get away without a lateral release for hallux valgus. Dr. Schneider cites a study by Park and coworkers on 122 patients who had a distal chevron osteotomy as part of a distal soft tissue procedure for severe hallux valgus. The authors found the medial transarticular approach to be effective in comparison with the dorsal first web space approach.

In a study of 169 patients, Shi found that while combining a dorsal web space release with a distal chevron osteotomy did not delay healing or increase the risk of avascular necrosis, it also did not significantly improve angular measurements or the sesamoid position.

In a study of 25 feet in 22 patients, Lamo-Espinoa found the scarf-Akin bunionectomy restored alignment in the first MPJ and restored the sesamoid apparatus without direct plantar-lateral soft tissue release. Ramdass and Meyr argued in favor of relocating the first metatarsal on top of the sesamoids that are relatively immobile.  

Hypermobility, if present, persists after tarsometatarsal joint arthrodesis, notes Dr. Dayton. However, he notes that hypermobility rarely occurs at the tarsometatarsal joint and is more common at the proximal joints. Hypermobility as an indication for a Lapidus bunionectomy is a “fallacy borne of novel ideas by Morton and confirmed by generations of multiple choice tests,” argues Dr. Dayton.

Surgical Approaches To Plantar Plate Tears
As Dr. Schneider notes, conservative care options for plantar plate tears include extra-depth or extra-width shoes, strapping and taping, or orthotic devices, balance padding, and non-steroidal anti-inflammatory drugs. He advises avoiding injections.

Surgical options for the plantar plate include direct repair via a dorsal or plantar approach, notes Dr. Schneider.

The advantages to the dorsal approach, according to Dr. Schneider, include the ability to shorten the first metatarsal, good visualization, the ability to address hammertoes. OK as is? and the ability to manage collaterals. Could we rephrase this as “the collateral ligaments”? He cites disadvantages of expense, the requirement for a metatarsal osteotomy, the possibility of a floating toe and the chance of not seeing the plantar plate tear. If a Weil osteotomy is necessary, Dr. Schneider uses two screws and makes a long cut. He says making a short cut will risk plantarflexing the first metatarsal and resulting pain.

As for the plantar approach, Dr. Schneider says the pros are obviating a metatarsal osteotomy, having direct access to the plantar plate and good visualization. OK as is to list good visualization as an advantage for both approaches? He cites cons to the plantar approach include possible disruption of the plantar skin and that one may still need to do a separate dorsal incision to address a hammertoe deformity. Slightly tweaked. OK as is?

Indirect repair can consist of a flexor digitorum longus tendon to extensor digitorum longus tendon transfer (Girdlestone-Taylor procedure). Here one can see a scarf bunionectomy. A study of 53 feet in 51 patients found the scarf osteotomy to be a reliable correction technique for moderate to severe hallux valgus with low rates of complication or recurrence, notes Harry Schneider, DPM.
Slightly tweaked. OK as is?///, notes Dr. Schneider. As he notes, the advantages to the indirect approach include the ability to dial in correction and less need for hardware while disadvantages include possible sausage toe.

**Addressing Iatrogenic Forefoot Issues**

Iatrogenic forefoot problems can be due to procedure choice, patient non-adherence or physiological factors, according to Diane Koshimune, DPM. She notes the potential etiologies include adjacent non-fixated arthroplasties, digital/MPJ implants, minimal incision surgery, scar/soft tissue contracture, lesser metatarsal surgery or joint destruction.

Dr. Koshimune delineates the goals of repair for the///forefoot///Do we need to specify a bit more here?///.

Balancing metatarsal loading will address the metatarsal parabola and sagittal dislocation. Establishing a functional MPJ can include sequential release. Dr. Koshimune notes that one can provide flexor power to a stable digit by fusing the toe.

As far as the classification of forefoot problems goes, Dr. Koshimune cites the system devised by Thomas Chang, DPM, FACFAS. //please add reference//

Stage 1 (potentially reconstructible). Dr. Koshimune says this stage mainly involves phalangeal components and one can fix the forefoot with implants or fusion.

Stage 2 (intermediate). The function of the MPJ remains in this stage but she notes MPJ instability can come from the toe or MPJ.

Stage 3 (salvage). In this stage, Dr. Koshimune notes the goals are to eliminate deformity and pain although surgeons are limited in what they can do.

**References**

Addressing Controversies In Foot And Ankle Surgery

In a session on controversies and complications at the Western Foot and Ankle Conference, these speakers offered insights on early weightbearing, the most effective technique for Lisfranc injuries and which surgeries have fallen out of favor.

By Brian McCurdy, Managing Editor

Will early weightbearing after surgery lead to non-union or will it lead more quickly to a return to functional or previous levels of activity? Lewis Freed, DPM, emphasizes that early does not equate with immediate. While early weightbearing can improve patient function and facilitate an earlier return to work, when patients bear weight too soon, Dr. Freed says it may cause a loss of fixation, compromise outcomes and lead to further surgery.

For early weightbearing after first MPJ surgery, Dr. Freed cites advantages in that minimal bending forces will occur at the fusion site to disrupt healing, which allows early weightbearing. He says disadvantages include a loss of fixation and wound healing problems. Dr. Freed cites a study by Dayton and McCall noting that early weightbearing facilitated clinical healing, radiographic union and a return to athletic shoes in 42 patients who had a primary first metatarsophalangeal joint (MPJ) arthrodesis.1 Mann and coworkers, in a study of 21 feet in 18 patients, also found early weightbearing after first MPJ arthrodesis was successful using splintage or lag screw fixation and a two-hole, low-profile partially locking titanium plate.2

In a retrospective analysis of 41 patients who had a modified Lapidus arthrodesis, Basile and colleagues found using a temporary K-wire as a third point of fixation may facilitate immediate protected weightbearing by reducing the load on the crossed lag screw construct.3 King and colleagues, in a study of 136 patients, found early weightbearing was effective with traditional crossed screw fixation after a Lapidus arthrodesis.4 Slightly tweaked. OK as is?5 Prissel and coworkers also found that early weightbearing after the Lapidus procedure does not increase the risk of non-union, according to Dr. Freed.5 However, Dr. Freed does not allow early weightbearing for his Lapidus patients.6 We need a brief sentence or two explaining why you don’t allow it.

With lateral ankle instability, Dr. Freed says advantages to early weightbearing include earlier recovery and proprioception, better function and avoiding stiffness. He cites an 81-patient study by Lee and coworkers, who recommended early post-op weightbearing for patients who had microfracture for small to midsized osteochondral lesions of the talus.6 In a study of 49 patients with chronic lateral ankle instability, Peterra and colleagues determined that early weightbearing is feasible after anterior talofibular ligament and calcaneofibular ligament advancement with suture anchor fixation, notes Dr. Freed.7

For patients with osteochondral lesions of the talus, pros for early weightbearing are an earlier return to sport and activity as well as less recovery time, notes Dr. Freed.8 He cites disadvantages of early weightbearing, saying prolonged immobilization and unloading of the joint may contribute to cartilage deterioration.9 OK as is linking early weightbearing with prolonged immobilization?

For patients who have had open reduction internal fixation (ORIF) for ankle fractures, Dr. Freed says early weightbearing can facilitate less stiffness and decrease recovery time and pain. In a retrospective study of 126 patients with isolated lateral malleolar and bimalleolar ankle fractures, Dr. Freed says Starkweather and colleagues showed no fracture displacement following early weightbearing.8

Dr. Freed has patients bear weight after Achilles repair if the repair has been successful and the skin is in good condition. In a review of 43 patients, Rigby and colleagues supported the use of the Achilles SutureBridge (Arthrex) to reattach the Achilles tendon with a mean time to weightbearing of 10 days.9 Dr. Freed says Speck and colleagues noted that accelerated rehabilitation after Achilles surgery improves early foot function.10

Dr. Freed keeps patients with calcaneal fractures non-weightbearing until he is confident the heel has healed, usually within six weeks, and if the skin is in good condition. Hyer and colleagues reviewed 17 calcaneal fractures repaired with locking plates.11 Dr. Freed notes patients began protected weightbearing four to five weeks after surgery and the authors detected no significant loss of calcaneal height, joint reduction or fixation stability.

In conclusion, Dr. Freed says early

DPM, emphasizes that early does not equate with immediate. While early weightbearing can improve patient function and facilitate an earlier return to work, when patients bear weight too soon, Dr. Freed says it may cause a loss of fixation, compromise outcomes and lead to further surgery.

For early weightbearing after first MPJ surgery, Dr. Freed cites advantages in that minimal bending forces will occur at the fusion site to disrupt healing, which allows early weightbearing. He says disadvantages include a loss of fixation and wound healing problems. Dr. Freed cites a study by Dayton and McCall noting that early weightbearing facilitated clinical healing, radiographic union and a return to athletic shoes in 42 patients who had a primary first metatarsophalangeal joint (MPJ) arthrodesis.1 Mann and coworkers, in a study of 21 feet in 18 patients, also found early weightbearing after first MPJ arthrodesis was successful using splintage or lag screw fixation and a two-hole, low-profile partially locking titanium plate.2

In a retrospective analysis of 41 patients who had a modified Lapidus arthrodesis, Basile and colleagues found using a temporary K-wire as a third point of fixation may facilitate immediate protected weightbearing by reducing the load on the crossed lag screw construct.3 King and colleagues, in a study of 136 patients, found early weightbearing was effective with traditional crossed screw fixation after a Lapidus arthrodesis.4 Slightly tweaked. OK as is?5 Prissel and coworkers also found that early weightbearing after the Lapidus procedure does not increase the risk of non-union, according to Dr. Freed.5 However, Dr. Freed does not allow early weightbearing for his Lapidus patients.6 We need a brief sentence or two explaining why you don’t allow it.

With lateral ankle instability, Dr. Freed says advantages to early weightbearing include earlier recovery and proprioception, better function and avoiding stiffness. He cites an 81-patient study by Lee and coworkers, who recommended early post-op weightbearing for patients who had microfracture for small to midsized osteochondral lesions of the talus.6 In a study of 49 patients with chronic lateral ankle instability, Peterra and colleagues determined that early weightbearing is feasible after anterior talofibular ligament and calcaneofibular ligament advancement with suture anchor fixation, notes Dr. Freed.7

For patients with osteochondral lesions of the talus, pros for early weightbearing are an earlier return to sport and activity as well as less recovery time, notes Dr. Freed.8 He cites disadvantages of early weightbearing, saying prolonged immobilization and unloading of the joint may contribute to cartilage deterioration.9 OK as is linking early weightbearing with prolonged immobilization?

For patients who have had open reduction internal fixation (ORIF) for ankle fractures, Dr. Freed says early weightbearing can facilitate less stiffness and decrease recovery time and pain. In a retrospective study of 126 patients with isolated lateral malleolar and bimalleolar ankle fractures, Dr. Freed says Starkweather and colleagues showed no fracture displacement following early weightbearing.8

Dr. Freed has patients bear weight after Achilles repair if the repair has been successful and the skin is in good condition. In a review of 43 patients, Rigby and colleagues supported the use of the Achilles SutureBridge (Arthrex) to reattach the Achilles tendon with a mean time to weightbearing of 10 days.9 Dr. Freed says Speck and colleagues noted that accelerated rehabilitation after Achilles surgery improves early foot function.10

Dr. Freed keeps patients with calcaneal fractures non-weightbearing until he is confident the heel has healed, usually within six weeks, and if the skin is in good condition. Hyer and colleagues reviewed 17 calcaneal fractures repaired with locking plates.11 Dr. Freed notes patients began protected weightbearing four to five weeks after surgery and the authors detected no significant loss of calcaneal height, joint reduction or fixation stability.

In conclusion, Dr. Freed says early
protected weightbearing ///Should we say “in general for lower extremity surgery” here? Just want to make it clear if this is intended to be a broad statement/// may allow the patient to return to activity and work earlier, is desirable to patients and may facilitate lower morbidity postoperatively.

A Closer Look At Repair Options For Lisfranc Injuries

Harry Schneider, DPM, says while the reported incidence of Lisfranc injuries is 0.1 to 0.9 percent, those figures may be too low. //please add reference// He says two-thirds of Lisfranc injuries are due to motor vehicle accidents, falls and crushes while the other one-third result from low-energy traumas and falls. Most dislocation is in the dorsal and lateral direction.

Surgeons should debride fibrous tissue and loose bodies, reduce first and second metatarsal base diastasis, fixate the Lisfranc, and fixate the other tarsometatarsal joint as needed, according to Dr. Schneider.

In a study of nine cadaver feet, Gaines and colleagues found that altering the placement of a guidewire across the midfoot significantly expanded the joint surface that screw placement affected.12 Dr. Schneider added that placing screws plantar to the joint midline raised the chance of fracture on both sides of the tarsometatarsal complex.

Dr. Schneider says Alberta and co-workers advocated dorsal plating as an alternative to ORIF with transarticular screws for displaced Lisfranc injuries.13 Researchers noted that transarticular screws and dorsal plates facilitated similar reduction of the first and second tarsometatarsal joints.

Dr. Schneider classifies Lisfranc injuries as subtle, high energy and ligamentous. He suggests performing ORIF but not fusion for subtle injuries. As he notes, Crates and colleagues found success in stabilizing 36 patients with subtle Lisfranc injuries, who had failed non-operative treatment, with either a dual screw or suture button technique.14

For high-energy and ligamentous injuries, Dr. Schneider advises fusion. He cites a study of Ly and Coetzee in 41 patients with isolated acute or subacute primarily ligamentous Lisfranc injuries, who had good outcomes with primary stable arthrodesis of the medial two or three rays in comparison to ORIF.15

What Techniques Are Surgeons Avoiding?

In a discussion of techniques surgeons are abandoning, Shannon Rush, DPM, detailed why he will no longer perform certain surgical procedures.

In patients who receive ORIF for fractures, Dr. Rush no longer performs ankle arthroscopy. Ackermann and colleagues analyzed 32,307 patients who had ORIF for ankle fractures, and noted that only 313 patients (1 percent) had a simultaneous ankle arthroscopy.16 /// Alternately, Dr. Rush says there may be an unrecognized chondral injury with malleolar fractures, which leads to persistent pain and stiffness. Dr. Rush also says one cannot appreciate marginal fractures on X-rays and they can damage articular cartilage.///Slightly tweaked. OK as is?///

Dr. Rush no longer performs open Broström procedures for ankle stability or delayed treatment, noting that patients with chronically unstable bone
often have insufficient tissue and dissecting through tissue will destroy it. In a study of 62 patients with grade III ankle sprains, Li and coworkers found anatomical ligament reconstruction with a variant of the Gould-modified Broström procedure with suture anchors effectively returned athletes to previous function.17

Dr. Rush no longer performs medial malleolus takedown osteotomies for osteochondral lesions. He says there can be stiffness, articular incongruity, delayed union, malunion and difficult early rehab with these osteotomies. He cites better techniques, such as a plafond osteotomy.

Dr. Rush no longer performs a microfracture technique for large osteochondral lesions, noting that the procedure has not been effective for big lesions in his experience.18 Alternatively, Dr. Rush does a plafond osteotomy for large osteochondral lesions.

Dr. Rush no longer routinely takes out sesamoids from plantar wounds. In diabetic foot ulcers, he says some believe they must remove bone from pressure points but then they forget about the biomechanics. Instead, Dr. Rush will perform a peroneus brevis longus transfer, which takes away the driving force as to why the patient got the wound. Could we rephrase this as “that caused the wound”???

References