Indications

Total ankle arthroplasty (TAA) is indicated when appropriate nonsurgical management of ankle arthritis fails. Indications for TAA in end-stage ankle arthritis with and without varus or valgus (coronal plane) deformity are the same, provided that the coronal plane deformity is corrected to a physiologic position with TAA and associated procedures. Although some authors have suggested absolute limits of coronal plane deformity for the results of TAA to be satisfactory, improved surgeon experience and realignment techniques continue to broaden these limits. Successful ankle realignment with TAA often requires concomitant foot realignment. Preoperative patient education should include discussion of the fact that foot realignment is preferably performed simultaneously with TAA but complex deformities occasionally necessitate staged procedures.

Some surgeons suggest that TAA should be preferred over ankle arthrodesis for patients with concomitant ipsilateral ankle and hindfoot arthritis and stiffness. In these patients, isolated ankle arthrodesis may result in persistent hindfoot pain, and tibiotalocalcaneal or pantalar arthrodesis may limit hindfoot and ankle function. In patients with concomitant ankle and hindfoot arthritis, TAA typically provides satisfactory pain relief at the ankle and reduces stress on the hindfoot, and ipsilateral hindfoot arthrodesis may improve coronal plane alignment.

Satisfactory TAA for arthritis associated with coronal plane deformity requires realignment on two levels. First, components must be implanted in appropriate physiologic and balanced ankle alignment, and second, the foot must be aligned in a plantigrade position to serve as a stable supporting platform. The author of this chapter often uses some or all of the following three methods to achieve optimal realignment: static soft-tissue (ligamentous) ankle balancing, static bony realignment, and dynamic soft-tissue (muscle-tendon) balancing.

Static soft-tissue balancing refers to the balance of the medial deltoid ligament and the lateral anterior talofibular ligament (ATFL) and calcaneofibular ligament (CFL). Static bony realignment involves proper implant positioning within the ankle mortise and foot realignment via osteotomies and/or arthrodesis. Dynamic soft-tissue balancing—between the posterior tibial tendon and the peroneus brevis and between the tibialis anterior tendon and the peroneus longus tendon—may not be fully appreciated until the patient is ambulating. Although the tibialis anterior and peroneus longus are antagonists, their insertions may result in both contributing to varus forces at the ankle in unbalanced ankle arthritis with coronal plane deformity.

Occasionally, correction of extraarticular coronal plane malalignment via simultaneous or staged tibial and fibular osteotomies is necessary. The author of this chapter generally informs patients that the extra-articular deformity will be corrected first and simultaneous TAA will be performed if it can be done safely. The author has anecdotally noted patients in whom isolated extra-articular realignments afforded surprisingly satisfactory pain relief despite associated end-stage ankle arthritis.

Medial release or medial malleolar osteotomy with or without lateral ankle ligament tightening has shown promise in optimizing outcomes of TAA done to manage incongruent varus ankle arthritis. Varus ankle arthritis often is associated with loose lateral ligaments, and releasing the contracted medial deltoid ligament or indirectly relieving deltoid ligament tension with a medial malleolar osteotomy allows for favorable ankle laxity to correct coronal plane malalignment. In the author’s experience,
minimizing tibial plafond and talar dome resection is important because medial and lateral ligament laxity often necessitate the use of a polyethylene insert that is larger than the standard size, and occasionally the polyethylene thickness needed to balance the ankle may not be available. However, the bone resection is often eccentric, particularly on the tibial plafond, to properly align the TAA prosthesis relative to the tibial shaft axis, and ligament balancing remains essential to optimize the stability of the TAA. In select cases, ligamentous laxity necessitates the use of thicker polyethylene sizes even in cases in which bone resection is minimized. Provided ligamentous balance is achieved, there is no contraindication to increasing polyethylene thickness to achieve optimal ligament balance. Although more information is needed to determine the ideal joint line and ligament isometry for TAA, in the author's experience, achieving satisfactory coronal plane ligament balance typically results in satisfactory outcome.

In coronal plane deformity, a properly implanted TAA prosthesis may contribute to optimal coronal plane realignment and stability as suggested by comparison of supramalleolar osteotomy and TAA for coronal plane ankle arthritis. Although the orthopaedic literature suggests satisfactory outcomes with joint-sparing realignment, incongruent talar tilt remains in many ankles despite corrective surgery. In contrast, properly performed TAA for ankle arthritis with coronal plane deformity, with the tibial component placed perpendicular to the tibial shaft axis, results in satisfactory correction of talar tilt in most patients.

### Contraindications

Contraindications to TAA in end-stage ankle arthritis with and without varus or valgus deformity are similar. Ankle arthrodesis is preferred over TAA when ankle arthritis is associated with neuromuscular deficits, poor bone quality, and neuroarthropathy. Varus or valgus ankle arthritis also may be better managed with arthrodesis when neuromuscular deficits and severe ligament imbalance cannot be adequately corrected. Preoperative patient education should include discussion of the fact that it may be necessary to convert to arthrodesis intraoperatively. Even when satisfactory rebalancing may be feasible, some authors advocate for arthrodesis rather than TAA in the setting of coronal plane deformity greater than 25°. High-demand patients with end-stage ankle arthritis, such as those who perform physical labor, may be better treated with arthrodesis.

With ankle realignment from varus to a physiologic position, the ankle-hindfoot ligament couple may correct the hindfoot to its anatomic position. In some patients with ankle malalignment, the hindfoot may have a compensatory coronal plane position; for example, varus ankle arthritis may be associated with valgus subtalar joint alignment. This compensatory subtalar valgus position may not be corrected with ankle realignment, resulting in heel valgus and potential subfibular impingement, in which case routine lateralizing or lateral closing wedge calcaneal osteotomy is contraindicated.

The author of this chapter favors performing TAA in isolation over simultaneous ipsilateral TAA and hindfoot arthrodesis for concomitant ankle and hindfoot arthritis. In the author's experience, isolated TAA provides satisfactory pain relief and function for most patients with both ankle and ipsilateral hindfoot arthritis. The author surmises that the combination of pain relief at the ankle and stress relief on the hindfoot afforded by TAA leads to satisfactory outcomes in most patients. When it is necessary to perform simultaneous TAA and hindfoot arthrodesis (typically to correct deformity), the author of this chapter protects the blood supply to the inferior talar neck by limiting the subtalar joint preparation to the posterior facet articulation and avoiding the anterior facet articulation in the talonavicular joint preparation. In some cases, staged hindfoot arthrodesis is necessary. In these instances, the author of this chapter recommends that the same precautions for hindfoot joint preparation be followed because insult to the talar body vasculature may be cumulative.

### Alternative Treatments

Nonsurgical management of ankle arthritis generally includes activity modification, medical management, corticosteroid injection, stiff-soled shoes with rocker modification, and bracing that corrects the sagittal plane position of the ankle in neutral. Bracing in patients with ankle arthritis and coronal plane deformity has the added challenge of realigning the foot and unloading the affected aspect of the ankle. Results of joint-sparing surgery, including joint débridement, supramalleolar and/or foot realignment osteotomies, and soft-tissue rebalancing, have demonstrated some promise; if ankle symptoms persist, the improved alignment may facilitate subsequent TAA. The most common alternative treatment to TAA for end-stage ankle arthritis with coronal plane deformity is arthrodesis, either isolated ankle arthrodesis or combined ankle and hindfoot arthrodesis. As with TAA, arthrodesis may require associated procedures to realign the foot.

### Results

Recent orthopaedic literature suggests that if varus or valgus deformity is adequately corrected, results of TAA for end-stage ankle arthritis associated with
Alignment in Total Ankle Arthroplasty With Coronal Plane Deformity: Bony and Ligamentous

coronal plane deformity may approach those of TAA in arthritic ankles with physiologic alignment. Some surgeons suggest better outcomes for TAA in patients with ankle arthritis with congruent coronal plane deformity (parallel tibial plafond and talar dome subchondral surfaces) compared with TAA in patients with ankle arthritis with incongruent coronal plane deformity (varus or valgus talar tilt within the ankle mortise). Improved techniques for soft-tissue balancing, particularly medial deltoid release and medial malleolar osteotomy to correct varus ankle arthritis, continue to blur this difference.

Techniques

Setup/Exposure
- The patient is positioned supine on the surgical table with support under the ipsilateral hip to maintain a vertical position of the foot.
- Additional hip support is needed to facilitate more internal rotation of the hip, which allows access to the lateral ankle and foot for lateral ligament repair, peroneal tendon procedures, and/or calcaneal osteotomy.
- The author’s anesthesia team prefers a popliteal block for pain control and a femoral block so that the thigh tourniquet is tolerated during the surgical procedure.
- A sequential compression device is used on the contralateral calf.
- Preoperative planning must be based on weight-bearing ankle and foot radiographs including hindfoot alignment views; these radiographs should be on display during the surgical procedure.
- For the TAA, the author of this chapter uses a standard anterior midline longitudinal ankle incision and performs additional incisions for associated realignment procedures. The incisions should be based on preoperative planning to preserve adequate skin bridge(s) from the principal TAA incision and to respect existing surgical incisions.

Instruments/Equipment/Implants Required
- In addition to the recommended instrumentation and implants for TAA, the author of this chapter always has these items available: a toothless but textured lamina spreader, a small reciprocating saw, a rasp, a stout pituitary rongeur, and curved curets. These instruments are useful for all TAA procedures and, in the author’s opinion, are essential for TAA performed for varus or valgus ankle arthritis.
- A toothless lamina spreader may be placed eccentrically within the joint to create safe joint distraction and facilitate posterior ankle exposure without compressing prepared tibial and talar surfaces. For resection in TAA in which a monoblock implant will be used, the author places the toothless lamina spreader eccentrically in the joint before initial tibial and talar preparation to realign the talar dome and limit bone resection (Figure 1).
- The small reciprocating saw, pituitary rongeur, curved curets, and rasp allow the surgeon to fine-tune the cuts and retrieve bone fragments on the prepared surfaces in a controlled fashion to optimize component positioning at the bone-prosthesis interface.
- When correcting coronal plane deformity, the surgeon should have the following items available for use in potential associated procedures: a thin oscillating saw for calcaneal osteotomy, a cannulated screw system to secure a calcaneal

Figure 1  Severe valgus ankle arthritis is shown in a preoperative weight-bearing oblique ankle radiograph (note lateral tibial plafond wear) (A) and a weight-bearing hindfoot alignment radiograph that demonstrates valgus heel position (B). C, Intraoperative AP fluoroscopic image demonstrates the use of a toothless lamina spreader to correct deformity and distract the lateral ankle joint to create optimal alignment for total ankle arthroplasty. D, AP fluoroscopic image demonstrates the appearance of the properly aligned ankle with the monoblock cutting guide applied.
osteotomy or hindfoot arthrodesis, the surgeon’s preferred suture for tendon transfer(s), the surgeon’s preferred method of fixation for metatarsal osteotomy or medial column arthrodesis, a wedge for cuneiform osteotomy, and bone graft for hindfoot arthrodesis.

**Procedure**

**CORRECTION OF VARUS ANKLE ARTHRITIS**

- Although a few degrees of residual varus malalignment are generally well tolerated, the surgeon should strive for perpendicular coronal plane tibial preparation and uniform, anatomic coronal plane talar dome preparation.
- In the author’s experience, intentional overcorrection into valgus imparted through the tibial cut should be avoided because it may lead to lateral gapping with varus stress.
- In varus ankle arthritis, wear is generally more pronounced on the medial talar dome. Often, the surgeon needs to resect residual bone and cartilage from the lateral talar dome to ensure that the talar resection guide promotes a neutral talar cut rather than one that is in varus (Figure 2).
- With the evolution of soft-tissue rebalancing techniques for TAA, even severe varus malalignment may be corrected (Figure 3).
- A medial soft-tissue release is performed by elevating the medial tibial periosteum, leaving the superficial deltoid fibers intact as a continuous sleeve to the medial talus. The deep deltoid fibers are released off the inferior aspect of the medial malleolus sharply with a knife and then with a periosteal elevator.
- The medial release may be done in a graduated manner, but complete release of the deep deltoid fibers is often necessary for satisfactory rebalancing. In the author’s experience, TAA performed with complete medial release and proper rebalancing in patients with long-standing varus ankle arthritis does not lead to overcorrection into valgus malalignment.
- After medial release, the elevated residual superficial deltoid ligament provides support, typically matching the lateral ligament complex that is also attenuated from long-standing varus ankle malalignment.
- To limit the amount of polyethylene thickness needed to properly tension the medial and lateral ligaments in a balanced fashion, the author of this chapter generally removes less tibial and talar bone than would be removed in physiologically aligned ankle arthritis. This carefully planned approach generally allows for isolated medial release without the addition of lateral ligament tightening in most TAAs in patients with varus ankle arthritis. The lateral gutter must be débrided of impinging soft tissue and bone to fully correct the position of the talus in the coronal plane.
- In lieu of medial soft-tissue release, medial malleolar osteotomy may be considered to correct varus malalignment (Figure 4).
- In the author’s opinion, to avoid vascular compromise to the medial malleolus, medial release and medial malleolar osteotomy should be considered mutually exclusive.
Alignment in Total Ankle Arthroplasty With Coronal Plane Deformity: Bony and Ligamentous

and the preoperative plan should be determined according to the procedure that will be preferred.

• The author performs a vertical osteotomy from the medial corner of the tibiotalar joint, mobilizing the medial malleolus, and then performs the TAA in routine fashion, allowing the osteotomized medial malleolus to find its new resting tension.

• Although some surgeons suggest that the medial malleolus will undergo satisfactory healing without fixation, the author of this chapter routinely secures the medial malleolus with medial plating through the same anterior incision used for TAA.

• A fibular osteotomy occasionally may be considered and generally requires an additional lateral incision.

• In varus malalignment, a lateral closing wedge and/or shortening osteotomy may facilitate proper talus component position and hindfoot alignment.

• The author of this chapter typically assesses coronal plane stability in neutral ankle position (with the trial polyethylene in place), holding dorsiflexion while applying varus and valgus stress, to simulate stability during weight bearing.

• Provided that a physiologic valgus heel position has been achieved, a lateral opening of 1 to 2 mm on varus stress does not warrant lateral ankle ligament repair because, in the author’s opinion, this opening will be well tolerated.

• The maximum distance of 2 mm is arbitrary, but if the surgeon wishes to achieve greater lateral stability, two options are available: (1) perform more medial release (if incomplete graduated medial release was performed) and use a polyethylene component one size larger than would otherwise be used or (2) perform lateral ankle ligament repair or reconstruction.

• Traditionally, soft-tissue rebalancing for varus ankle arthritis was limited to isolated lateral ankle ligament repair or reconstruction without medial release. As mentioned previously, in the author’s experience, after medial release and limited bone resection, the attenuated lateral ankle ligaments may be effectively balanced with the released medial soft tissues, making lateral ankle ligament reconstruction less common than previously reported.

• In cases in which lateral opening remains during varus stress despite complete release of the medial soft-tissue contracture, the author of this chapter typically performs lateral ankle ligament repair or reconstruction (Figure 5).

• Next, the trial polyethylene component is removed to optimize lateral ligament tightening, taking care to protect the metal surfaces if the final metal components have already been implanted. In the author’s experience, the lateral ankle ligaments, although attenuated, are nearly always stout enough to provide satisfactory ankle stability. Lateral ankle ligament repair is similar to the modified Brostrom procedure for patients without ankle arthritis, but the surgical approach is more posterior to preserve an adequate skin bridge from the principal TAA wound.

• Generally, the author of this chapter does not separate the inferior extensor retinaculum from the deeper sleeve of ligaments containing the

Figure 3  A, Preoperative weight-bearing AP radiograph demonstrates left varus ankle arthritis in a 72-year-old woman with severe ankle pain. B, Intraoperative photograph shows medial soft-tissue release, with use of an elevator to completely release the deep deltoid ligament fibers. C, Intraoperative photograph shows a balanced mobile-bearing total ankle arthroplasty prosthesis. D, Two-year follow-up weight-bearing AP radiograph demonstrates maintained corrected coronal plane alignment and stable implants. The patient reported satisfactory ankle function and marked improvement in ankle pain.
ATFL and CFL, but simply releases this thickened confluence of ligaments from the distal fibula while protecting the peroneal tendons.

• The osteophytes are débrided from the distal fibula, and two suture anchors are placed in the distal fibula, one each at the ATFL and CFL footprints.

• With the ankle held in neutral sagittal plane position and slight hindfoot valgus maintained, the ligaments are advanced to the distal fibula. The author of this chapter also elevates the distal fibular periostium and uses it to reinforce the repair. Performing the lateral ankle ligament reconstruction with the polyethylene removed allows for a tighter ligament repair than if the polyethylene were left in place; in fact, when reassessing the lateral ankle ligament tension after ligament repair, the author of this chapter typically downsizes the polyethylene thickness.

• Foot rebalancing procedures for
varus malalignment are the same as those typically performed for cavovarus foot realignment and include lateral displacement or lateral closing wedge calcaneal osteotomy, peroneus longus to peroneus brevis transfer, first metatarsal dorsiflexion osteotomy, and occasional plantar fascia release.

- Transfer of the posterior tibial tendon behind the tibia to the peroneal tendons may be risky when performed concomitant to TAA. In select patients with severe peroneus brevis degeneration, fractional lengthening of the posterior tibial tendon through the principal anterior incision is possible.
- Occasionally, in patients with severe deformity, the author performs tibialis anterior tendon transfer to the middle cuneiform using an interference screw technique. This relatively simple procedure may be performed through the same anterior incision used to implant the TAA prosthesis; the transferred tibialis anterior tendon is easily contained under the repaired extensor retinaculum (Figure 5).

CORRECTION OF VALGUS ANKLE ARTHRITIS

- Although a few degrees of residual valgus malalignment are generally well tolerated, the surgeon should strive for perpendicular coronal plane tibial preparation.
- In patients with valgus ankle arthritis, the lateral tibial plafond is often eroded, and therefore relatively little lateral tibial bone should be resected relative to the medial bone.
- Similarly, in the presence of associated lateral talar wear, the author of this chapter removes residual medial talar dome cartilage and some medial talar dome bone to promote a neutral talar dome cut through the talar resection guide.
- Although a lateral release for valgus ankle arthritis may seem logical, the presence of lateral ligament laxity and the fact that much of the deformity stems from bony erosion means that this procedure is rarely required. If lateral contracture is indeed present, the author of this chapter typically performs the release through the principal incision.
Degenerative Conditions of the Ankle

using a blunt elevator in the lateral ankle gutter and the subfibular region to allow the talus to rebalance.

- In the author’s experience, few patients with end-stage ankle arthritis and severe valgus talar tilt require medial deltoid ligament reconstruction. As with the lateral ankle ligaments in varus ankle arthritis, the author has found that soft-tissue balance between the lateral ankle ligaments and the attenuated medial ligaments is possible with minimal bone resection in most patients.

- In the occasional patient with complete medial ligament incompetence, direct ligament repair is rarely feasible. Medial ankle ligament reconstruction performed simultaneously with TAA has the potential for wound complications (separate medial incision), stress fracture (talar and medial malleolar tendon interference screw fixation), and vascular compromise to the talar dome. However, if the TAA prosthesis can be placed in optimal position and the medial deltoid ligament reconstruction is performed judiciously, this procedure may represent an attractive alternative to tibiotalocalcaneal arthrodesis.

- In select patients with fibular malunion, medial closing wedge fibular osteotomy with or without fibular lengthening may be warranted to optimize correction of valgus deformity. The fibular osteotomy generally requires a separate, judiciously placed incision.

- Foot rebalancing procedures for pes planovalgus associated with varus ankle arthritis are essential to maintain optimal TAA alignment. These procedures include medial displacement calcaneal osteotomy and/or lateral column lengthening, peroneus brevis to peroneus longus transfer, and plantar flexion osteotomy of the medial cuneiform.

- The surgical incisions must be carefully planned relative to the principal anterior ankle incision.

- The ankle-hindfoot couple often markedly improves foot alignment after the TAA prosthesis is implanted. The author of this chapter therefore generally completes the TAA before performing associated foot procedures, with the exception of Achilles tendon lengthening, when indicated.

- Hindfoot and medial column arthrodesis are far more common when correcting valgus ankle arthritis than when correcting varus ankle arthritis. Anecdotally, satisfactory support for TAA from ipsilateral pes planovalgus is often more effectively achieved with arthrodesis than with joint-sparing procedures (Figures 6, 7, and 8).

- The author of this chapter limits subtalar preparation to the posterior facet via a limited sinus tarsi approach in an effort to preserve the blood supply of the inferior talar neck and via a distal extension of the principal TAA exposure. Careful talonavicular joint preparation, avoiding the inferior portion of the talar head near the inferior talar neck vasculature, is advised.

- Medial column arthrodesis also may be performed through an extension of the principal TAA incision. Taking care to preserve skin bridges, a separate limited incision may be safely made to perform tarso-metatarsal joint arthrodesis.

Wound Closure

- Wound closure for the TAA is multilayered and includes the capsule, extensor retinaculum, subcutaneous layer, and skin.

- With realignment in the coronal plane, the extensor retinaculum may be difficult to close completely.

Postoperative Regimen

The patient’s ankle should be immobilized in a cast with protected weight bearing for 6 weeks after isolated TAA. Casting and protected weight bearing may be extended to ensure adequate healing time for the associated procedures.

Avoiding Pitfalls and Complications

It is important to minimize bone resection in the correction of coronal plane deformity in patients undergoing TAA. In patients with long-standing ligament attenuation on one side, releasing the opposing contracted ligaments typically creates a considerable gap in the joint. To balance the joint, thicker polyethylene sizes are generally required. Generous bone resection in conjunction with ligament releases risks not having adequate polyethylene thickness to balance and stabilize the TAA. Minimizing bone resection, particularly tibial bone resection, generally averts this situation.

Counterintuitively, some patients with preoperative valgus talar tilt may require lateral ankle ligament repair or reconstruction. These patients likely represent a subset of those with global ankle instability and/or wear of the lateral tibial plafond. With proper ligament balancing, including lateral ligament tightening, TAA may be successfully performed in these patients.

Although the author of this chapter prefers to perform TAA and all necessary associated procedures simultaneously, occasionally the combination of procedures in a single procedure is not safe. The author almost always performs TAA first because correction of the ankle-hindfoot couple often leads to considerable foot correction with proper ankle realignment. The threshold to stage the associated procedures should
be low when the safe surgical time is consumed by the TAA. In the author’s opinion, having a safe closure of the principal wound over the TAA is best.

In patients with severe deformity, the author routinely obtains patient consent to convert to arthrodesis if TAA is determined intraoperatively not to be feasible. Although conversion to arthrodesis is rarely necessary, prudent preoperative planning and patient education are advised.

Complications of TAA in patients with varus or valgus ankle arthritis are the same as those of any TAA but include greater risk of wound complications if associated procedures are performed. Incomplete correction of deformity in the ankle, foot, or both eventually may lead to failure of the TAA. In most patients, physiologic ankle and foot alignment are essential for long-term implant survival.

If ligament balance cannot be achieved despite proper technique, intraoperative conversion to arthrodesis should be considered; TAA with satisfactory bony alignment but without satisfactory ligament support typically fails. Vascular injury to the talar dome may occur in patients with isolated TAA, and this risk increases with associated procedures, particularly ipsilateral hindfoot arthrodesis.

Correction of moderate to severe varus ankle arthritis with ankle and foot realignment may result in tarsal tunnel syndrome. Although the author of this chapter does not advocate routine tarsal tunnel release in all patients undergoing varus ankle and hindfoot realignment, awareness of potential tarsal tunnel symptoms should be maintained.

Figure 6  A, Bilateral AP weight-bearing ankle radiographs demonstrate left valgus ankle arthritis associated with pes planovalgus deformity in a 75-year-old man. B, Oblique left ankle weight-bearing radiograph demonstrates valgus deformity, loss of lateral joint space cartilage, and subfibular impingement. C, Hindfoot alignment radiograph further demonstrates severe hindfoot valgus. D, Lateral left weight-bearing radiograph of the ankle and foot demonstrates severe pes planovalgus deformity. E, Weight-bearing bilateral AP foot radiographs demonstrate forefoot abduction and talar head uncovering.
Intraoperative photographs of the same patient shown in Figure 6 show exposure of the talonavicular joint by distal extension of the anterior ankle incision (A), judicious preparation of the talonavicular joint (B), and tibial preparation accomplished with minimal bone resection (C). D, Intraoperative photograph shows that although the external alignment guide is parallel to the tibial shaft axis, the eccentric tibial plafond cut is due to the lateral tibial plafond wear pattern with valgus ankle arthritis. E, Intraoperative photograph shows subtalar joint preparation. Note the adequate skin bridge from the anterior incision and preparation avoiding the inferior talar neck blood supply. Intraoperative photograph (F) and lateral fluoroscopic image (G) show subtalar joint screw placement facilitated by a simultaneous anterior approach. Use of the simultaneous anterior approach allows passage of guide pins from the ideal talar dome position across the subtalar joint and through the calcaneus so that screws can be placed from the calcaneus into the talar body. H, Intraoperative photograph shows peroneus brevis to peroneus longus tendon transfer done to promote plantar flexion of the first ray and diminish valgus force.

Figure 7
Alignment in Total Ankle Arthroplasty With Coronal Plane Deformity: Bony and Ligamentous

Bibliography


Figure 8 Follow-up radiographs of the same patient shown in Figures 6 and 7. A, Weight-bearing AP radiograph of total ankle arthroplasty with a fixed-bearing prosthesis demonstrates improved alignment. Note the prophylactic medial malleolar plate. B, Lateral ankle and foot radiograph demonstrates improved foot alignment to support total ankle arthroplasty.
Degenerative Conditions of the Ankle


