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September 2018

Current Concepts With First MPJ Implants

Essential surgical insights

Wound Care Dressings: What You Should Know

Keys to appropriate dressing selection

Rethinking Post-Op Pain Management

Could an emerging protocol help reduce opioid use?

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Features

Current And Emerging Concepts With First MPJ Implants

Offering a closer look at the evolution of first MPJ arthroplasty, these authors discuss early implant designs, assess the pros and cons of unipolar and bipolar devices, and address common complications.

By H. John Visser, DPM, FACFAS, Jesse Wolfe, DPM, Tyler McKee, DPM, and Emily Keeter, DPM

Key Considerations With Dressing Selection In Wound Care

With the plethora of wound dressings available, how can you choose the right dressing for your patients? Assessing the merits and drawbacks of current and emerging dressings, these authors share their experience with multi-layer dressings, wound cleansers, dressings that facilitate wound debridement and others.

By Kazu Suzuki, DPM, CWS, and Pegah Samouhi, DPM

Emerging Advances In Lateral Ankle Stabilization

Given the common nature of lateral ankle injuries and the level of dysfunction that can result from significant injuries, these authors suggest that combining the use of semitendinosus allograft and the Broström-Gould technique could provide a viable reconstructive option for surgical repair.

By Dustin Constant, DPM, Sean Betesh, DPM, David Caminear, DPM, FACFAS, Jeffrey DeLott, DPM, FACFAS, and Peter Blume, DPM, FACFAS

A Guide To Postoperative Pain Management

In light of the ongoing prescription opioid epidemic, these authors offer a thorough review of current guidelines and pertinent insights from emerging literature, and share what they have learned from their current post-op pain management protocol for patients.

By Troy Boffeli, DPM, FACFAS, and Catlea Gorman, DPM

How To Address Equinus In The Athlete

Does every athlete have equinus? How can physicians accurately measure ankle joint dorsiflexion? How effective is therapeutic stretching? This author reviews the literature to answer these questions and examines the relationship between equinus, Achilles tendinopathy and plantar fasciitis.

By Patrick A. DeHeer, DPM, FACFAS, FASPS, FFPM RCPS (Glasg)

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Online Case Study

Managing Complications From An Unexpected Source In Charcot Joint Surgery

These authors discuss complications including infection and non-union that resulted from a foreign body left in the foot during long-term outpatient wound care.

By Brittany E. Mayer, DPM, Noman A. Siddiqui, DPM, MHA, and Tarina Ayazi

Online Case Study

Treating A Rare Cellular Schwannoma In A Fifth Digit

Noting schwannomas rarely arise in the foot and ankle alone, these authors discuss the treatment of cellular schwannoma in the fifth toe in a 23-year-old patient.

By Brad M. Ciano, DPM, and Richard Reuter, DPM

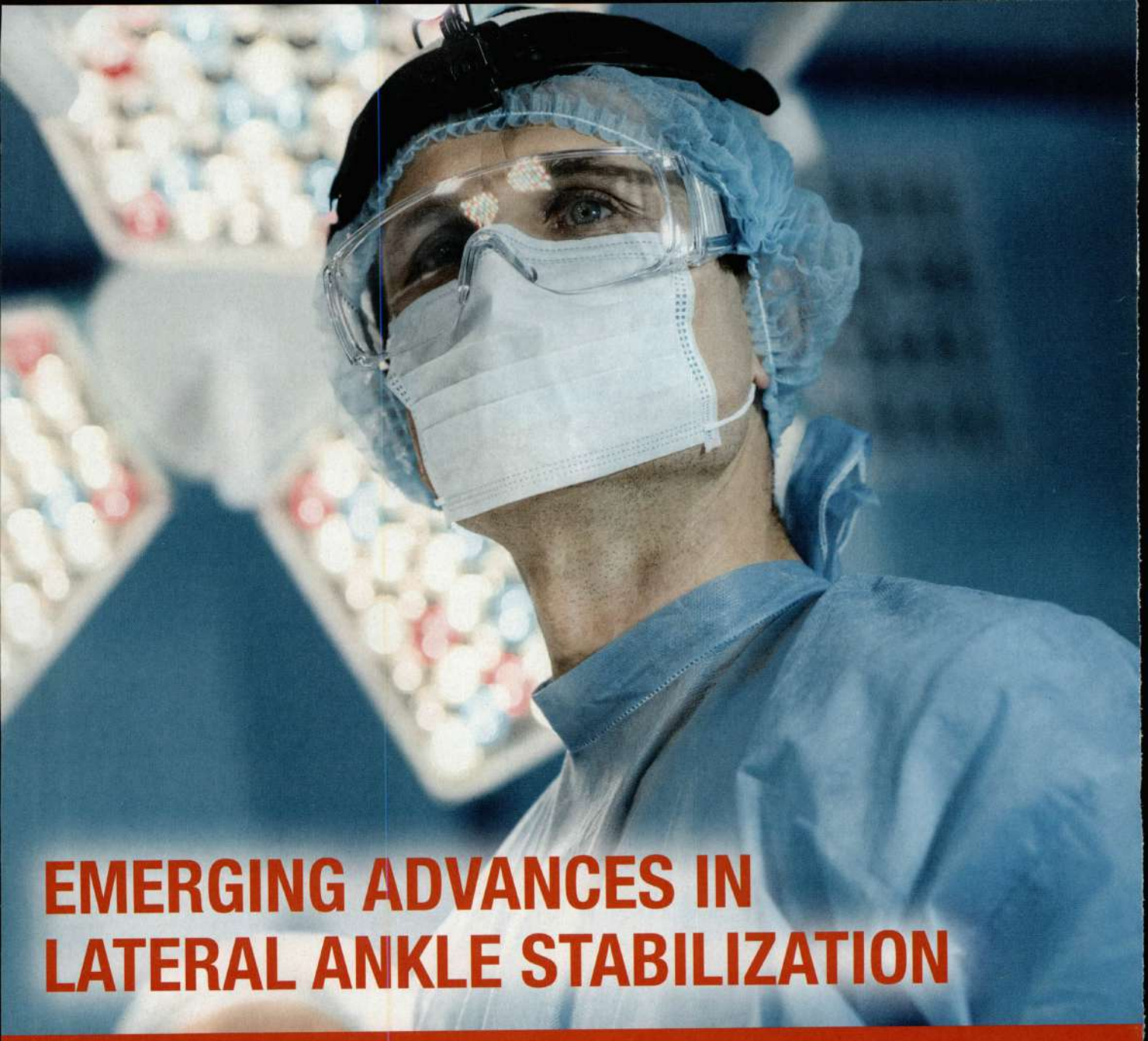
Residency Corner

Navigating Challenges In Residency Programs

These third-year residents discuss institutional support in their programs, how to handle on-call responsibilities and working with fellow residents who may be underperforming.

Clinical Editor: David Bernstein, DPM, FACFAS; Panelists: Wesley Jackson, DPM, Dalton Ryba, DPM, and Tenaya West, DPM

DPM Blogs



EMERGING ADVANCES IN LATERAL ANKLE STABILIZATION

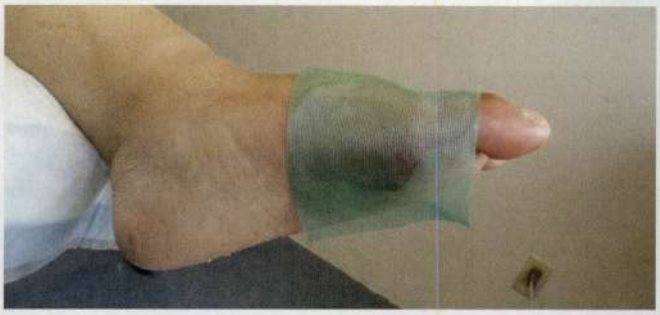
Given the common nature of lateral ankle injuries and the level of dysfunction that can result from significant injuries, these authors suggest that combining the use of semitendinosus allograft and the Broström-Gould technique could provide a viable reconstructive option for surgical repair.

By Dustin Constant, DPM, Sean Betesh, DPM, David Caminear, DPM, FACFAS, Jeffrey DeLott, DPM, FACFAS, and Peter Blume, DPM, FACFAS

Lateral ankle injuries are among the most common acute and chronic pathologies of the lower extremity, accounting for 15 to 25 percent of all musculoskeletal injuries.[1-3] These injuries range from minor to major with the higher-grade sprain leading to severe dysfunction and ankle instability.

The preferred method of treatment for acute and chronic ankle sprains remains conservative therapy with aggressive physical therapy for proprioceptive training and strengthening of the lower extremity musculature.[1,4] However, oftentimes pain and instability will persist despite these modalities, and surgical intervention is warranted.

There are many different treatment options available for the surgical correction of lateral ankle instability. We can broadly classify these options into three methods: direct ligamentous repair, non-anatomic ligamentous reconstruction and anatomic ligamentous reconstruction (autograft or allograft). No matter the surgical technique, these procedures focus on restoring the talar constraints both anteriorly and laterally. The literature documents overall success between 80 and 95 percent, regardless of the procedure.[2]



Here is a non-adherent plastic mesh dressing. Most dressings have a few years of shelf life and simplifying your dressing formula can minimize waste. In regard to cost, clinicians should consider the wear time of the dressing as well.

lems such as lymphedema and venous insufficiency, including venous leg ulcers. Although we have found that insurance coverage is making it increasingly difficult to provide these devices at minimal cost to our Medicare patients, patients can purchase similar devices from Amazon.com, etc. Brand examples include Flexitouch System (Tactile Medical), NormaTec Pneumatic Compression Device (NormaTec Medical) and others.

Platelet-derived growth factor (PDGF) gel. Although its FDA indication is limited to diabetic neuropathic foot ulcers, PDGF gel stimulates fibroblast proliferation to increase growth of granulation tissue. When one uses this appropriately as an adjunct to good ulcer care, PDGF can increase the rate of wound closure.[4] The drawback is that PDGF is a prescription item and can be expensive to some patients. Clinicians also need to refrigerate the PDGF gel to ensure its effectiveness. Currently, Regranex (Smith and Nephew) is the only such product available in the U.S. ■

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Accordingly, let us take a closer look at a surgical technique guide for lateral ankle reconstruction with semitendinosus allograft and Broström-Gould lateral ligament reconstruction for chronic lateral ankle pain and instability. This is a powerful procedure in reestablishing structure to an attenuated lateral ankle ligament complex. There are scarce reports in the literature describing this technique and there are no reports documented within the podiatric literature.

Assessing The Benefits And Limitations Of Current Surgical Options For Lateral Ankle Instability

The Broström procedure is a method of direct ligamentous repair of the anterior talofibular ligament.[5] Today, surgeons universally perform this procedure to increase lateral ankle stability.[6] The Broström procedure also has good long-term results with Bell and colleagues showing that 91 percent of 31 patients described their ankle function as good or excellent after a 26-year follow-up.[7]

However, the Broström procedure has several drawbacks, especially as an isolated procedure. For one, this procedure is not always possible when there is obliteration of the lateral ankle ligament complex due to chronic, repetitive trauma. Additionally, sometimes the patient requirements are more demanding than the procedure can accommodate.

Non-anatomic lateral ankle reconstructions were once popular but are now fading from the mainstream. These procedures include the Watson-Jones, Chrisman-Snook and Evans tenodesis procedures. The complication rate is higher in this group and includes increasing stiffness across the subtalar joint and ankle joint due to abnormal biomechanics. In a study involving 40 cadaver ankles, Liu and Baker found that the use of a modified Broström procedure resulted in less anterior talar displacement and talar tilt angles in comparison with the Watson-Jones and the Chrisman-Snook procedures.[6] The authors also noted the modified Broström procedure produced more mechanical restraint.

Rosenbaum and coworkers found the Evans, Watson-Jones and Chrisman-Snook tenodesis procedures decreased ankle joint complex movement by decreasing subtalar movement, but did not correct talocrural joint instability.[8]

This anteroposterior stress X-ray demonstrates frontal plane instability in the ankle.

The placement of guidewires in anatomical orientation of the anterior talofibular ligament and calcaneofibular ligament should be approximately 110 degrees.

Also, when surgeons perform Watson-Jones, Chrisman-Snook and Evans procedures, they do so at the expense of other local autografts or the sacrifice of the peroneal (brevis and more recently longus) tendons. Donor site morbidity is a concern with reported loss of strength following the postoperative course for all three of the procedures.[9,10]

Newer techniques for lateral ankle ligament reconstruction focus on the anatomic repair of the anterior talofibular ligament and the calcaneofibular ligament. These procedures are modifications of the original Elmslie procedure.[11] One may use allografts to prevent donor site morbidity while still achieving functional stability.

Authors have proposed the use of anatomic lateral ankle ligament reconstructions in patients with increased demands (including ligamentous laxity, chronic instability and obesity), elite athletes and those with previously failed lateral ankle ligament surgery.[2,12] The robust nature of the ankle stabilization allows for wider reaching indications. Clanton and colleagues performed a biomechanical cadaveric analysis of the semitendinosus allograft versus intact lateral collateral ligaments, and discovered each had similar strength and stiffness.[12]

A Closer Look At The Authors' Surgical Technique

At minimum, preoperative stress X-rays are indicated for patients with a lateral ankle injury although most patients will receive magnetic resonance imaging (MRI) prior to this due to the chronicity of the disorder. Ensure the use of general anesthesia and a preoperative peripheral nerve block to the affected lower extremity. Place the patient in the lateral decubitus position. Use a pneumatic thigh tourniquet set at 250 to 300 mmHg based on the systolic blood pressure.

Perform all lateral ankle ligament reconstructions in conjunction with ankle arthroscopy to first assess for intra-articular damage. Manipulate the affected lower extremity in a frog leg position and station the foot on a knee bolster underneath the popliteal fossa to perform the arthroscopic portion of this surgery. Create standard 1 cm anteromedial and anterolateral portals, and use a 4.0 mm 30-degree arthroscope. Address pathology within the ankle joint at this time.

Upon completion of the arthroscopic portion of the surgery, remove the knee bolster and relax the patient into the lateral decubitus position. Make an 8 to 10 cm curvilinear incision on the lateral side of the right ankle along the course of the peroneal tendons. Identify and incise the peroneal tendon sheath as well as the superior and inferior peroneal retinaculum. Retract the peroneal tendons plantarly. Next use a bovie cautery to elevate a full thickness

Here one can see a thawed LifeNet Health fresh, frozen semitendinosus allograft prior to whip stitching.

Final X-rays demonstrate anchor placement in both the talus and calcaneus.

flap at the anterolateral ankle joint, involving both the anterior capsule and fibular periosteum.

We use the Bio-Tenodesis Screw System (Arthrex) for lateral ankle stabilization. Create two bone tunnels in the distal fibula using guidewires in approximate anatomical orientation of the anterior talofibular ligament and calcaneofibular ligament at 110 degrees. One can employ intra-operative fluoroscopy to confirm positioning. We used a cannulated system to ream over the guidewires and also fashioned bone tunnels in the anterolateral talar corner as well as the posterosuperior calcaneus at the level of the calcaneofibular ligament insertion.

Prepare a fresh, frozen semitendinosus allograft (LifeNet Health) and size it on the back table. Whip stitch the two ends of the graft with 0 Vicryl. Use a Bio-Tenodesis screw (5.5 x 15 mm) to adhere one end of the semitendinosus allograft into the anterolateral talar corner. Then pass the graft through the bone tunnels on the distal fibula with the foot in a neutral ankle position with a slightly inverted subtalar joint. Insert a second Bio-Tenodesis screw (4.75 x 15 mm) through the bone tunnel in the distal fibula from anterior to posterior. Then pass the remaining free end of the allograft from its position exiting the distal fibula into the posterosuperior calcaneus. Under slight tension, insert a third Arthrex Bio-Tenodesis screw (6.25 x 15 mm) from lateral to medial in the calcaneus.

Final intraoperative fluoroscopy confirms the position of the anchors. With the anterior talofibular ligament and calcaneofibular ligament now recreated, obtain stress films. While maintaining the foot slightly everted at the ankle and in addition to the allograft reconstruction, reapproximate the existing anterior talofibular ligament and anterior ankle joint capsule in a pants over vest fashion utilizing 2-0 FiberWire (Arthrex) and 2-0 PDS Suture (Ethicon). Reinforce this with the Gould modification to repair the extensor retinaculum. Repair the superior peroneal retinaculum with 2-0 FiberWire and repair the peroneal sheath with 2-0 Vicryl and 2-0 PDS suture. Repair subcutaneous tissue with 4-0 Monocryl and repair the skin with skin staples.

Apply a plaster posterior U-splint to the affected lower extremity. Give the patient strict instructions to remain non-weightbearing during the postoperative course. Following staple removal at the second or third post-op week, cast the patient for four additional weeks and transition the patient to a controlled ankle motion walker at six weeks. Schedule regular follow-ups.

What The Literature Reveals

In a 2012 study involving 27 patients (28 ankles) with chronic lateral ankle instability, Jung and colleagues assessed the use of a semitendinosus tendon allograft and interference screws in anatomic reconstruction of the anterior talofibular and calcaneofibular ligaments.[13] The mean American Orthopaedic Foot and Ankle Society Ankle-Hindfoot Score (AOFAS AHS) was 91 postoperatively with significant reduction in the talar tilt (from 17.8 to 6.7 degrees) and anterior draw (from 10.0 mm to 4.5 mm).[13]

Dierckman and Ferkel expanded on these findings when reporting on 31 patients with 33 ankle injuries.[14] Surgeons achieved 100 percent patient satisfaction with 85 percent good to excellent results and a reduction in the Vi-

sual Analogue Scale pain score from 7.3 preoperatively to 1.9 postoperatively. Seventy-one percent of study participants were able to return to or one level below their pre-injury activity without ankle arthritis. These results parallel those from Coughlin and colleagues, who were able to achieve 100 percent good to excellent results, a postoperative AOFAS AHS score of 98 and a reduction in both talar tilt (13 to 3 degrees) and anterior drawer (5 mm) using a gracilis autograft.[15]

In a study of 25 patients with chronic ankle instability who had reconstructive ankle surgery, Wang and coworkers found that the use of semitendinosus autograft facilitated ankle stability and noted that the mean AOFAS score increased from 71.1 to 95.1.[16] Xu and colleagues, in a study of 68 patients, found semitendinosus allografts facilitated a short healing time and few donor site issues.[17]

Final Notes

While semitendinosus allograft may not be a primary technique for repair, our results along with these prior publications demonstrate an effective anatomical repair for chronic lateral ankle injuries. ■

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For further reading, see "Current Concepts In Minimally Invasive Lateral Ankle Stabilization" in the March 2018 issue of Podiatry Today, "What The Emerging Literature Reveals About Treating Lateral Ankle Injuries" in the September 2014 issue or "A Guide To Addressing Lateral Ankle Instability" in the December 2009 issue.

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