Use of a Lateral Calcaneal Eversion Wedge to Decrease Pain and Improve Function post Chrisman-Snook Procedure: A Case Study.

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Cohort 27MS

Fall 2021

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Abstract:

Background and Purpose: Lateral ankle instability (LAI) following lateral ankle sprains is prevalent in the United States. There are more than 70 procedures described for LAI, most resulting in prolonged immobilization to allow for tissue healing after surgery.[1] Prolonged ankle immobilization contributes to decreased ankle-foot ROM and results in altered gait kinematics, pain, and loss of function. The purpose of this case study is to examine the improvement in pain and function following the inclusion of a lateral calcaneal eversion wedge during gait.

Case Description*:* A 33-year-old female underwent Chrisman-Snook procedure after 1 year of LAI. Following the surgery, the patient experienced altered gait mechanics, pain, and loss of function. The patient received 13 PT visits over the course of 18 weeks. Physical Therapy treatment included manual therapy, therapeutic exercise and the inclusion of a 5/8" lateral eversion wedge to wear in the right shoe while ambulating in standard shoes.

Outcomes*:* Following 18 weeks of Physical Therapy, the patient reported a significant improvement in pain on the Numeric Pain Rating Scale (NPRS) and function on the Patient Specific Functional Scale (PSFS). The patient achieved the goals of returning to weightlifting and standing for a full workday as a Veterinary technician.

Discussion*:* The outcomes from this case report suggest that patients who undergo the Chrisman-Snook procedure may benefit from the inclusion of a lateral eversion wedge in gait to assist with pain relief and improved function. Future research is necessary to form a broader consensus regarding best practice treatment recommendations following this procedure.

Background and Purpose

Ankle sprains are the most common musculoskeletal injury in the United States with an incidence of 30,000 per day.[1] The most common type of ankle sprain involves the lateral ligament complex and is typically caused by an inversion force on a plantarflexed foot.[1] The lateral ligament complex of the ankle consists of the anterior talofibular ligament (ATFL), the calcaneofibular ligament (CFL), and the posterior talofibular ligament (PTFL) all working together to control lateral ankle stability.[2] Due to the fibers running parallel to the foot in neutral position, the ATFL becomes taught when the foot is plantarflexed.[2] The ATFL is thus the most commonly injured ligament of the lateral complex due to most ankle injuries occurring in plantarflexion.[1]

Chronic lateral ankle instability is often demonstrated in patients with pain, recurrent giving way, and positive stress tests such as anterior drawer and talar tilt tests.[2] Patients with these symptoms, who fail non-operative treatment, are usually referred for surgical intervention. Two types of ankle instability have been described in the literature: mechanical and functional. Functional instability is defined as motion beyond voluntary control but does not exceed the physiologic range of motion whereas mechanical instability is defined as motion beyond the physiologic range of motion.[2]

Additional research has suggested that patients with acute lateral ligament tears or chronic functional instability might be best managed with bracing and a rehabilitation program, and although controversy still exists regarding the optimal treatment for patients with chronic mechanical ankle instability, there is a relationship between chronic lateral ankle instability and late sequelae such as arthritic progression and

therefore surgical intervention is often recommended.[1] Furthermore, some authors suggest that the combination of mechanical and functional instability is the most commonly reported indication for lateral ankle reconstructive surgery.[2]

Surprisingly, more than 70 different operative procedures have been described for the treatment of chronic lateral ankle instability.[1] The Chrisman-Snook procedure is a nonanatomic reconstruction using a tenodesis of the peroneus brevis which restricts ankle motion without repair of the ligaments of the ankle. In the Chrisman-Snook reconstruction, a split peroneus brevis tendon is transferred from anterior to posterior through the fibula and into the calcaneus. Initially, the reported results of this procedure are comparable to anatomic reconstruction with 90% good to excellent results, however it is also noted that normal ankle kinematics are not restored post-operatively and there is a loss of subtalar motion. Although the Chrisman-Snook procedure is considered more durable than anatomic reconstruction, all the non-anatomic repairs appear to have similar anatomic problems that predispose the patient to subtalar stiffness and non-physiologic kinematics.[1]

Range of motion of the ankle primarily occurs in the sagittal plane, with plantarflexion and dorsiflexion occurring primarily at the tibiotalar joint.[3] Research indicates a total of 65-75 degrees of motion, moving from 10-20 degrees of dorsiflexion through 40-55 degrees of plantarflexion. The total range of motion in the frontal plane is much lower, roughly 35 degrees with 23 degrees of inversion to 12 degrees of eversion. With the calcaneus as the strongest and most posterior bone of the foot providing attachment for the Achilles tendon, it forms a tri-planar, uniaxial joint. It is important to note that for

activities of daily living, the ROM required in the sagittal plane is significantly less than full ROM, with a maximum of 30 degrees for walking and 37 to 56 degrees for ascending and descending stairs.[3]

Correct arthrokinematic movements within the foot and ankle have a direct influence on the ability of the lower limb to attenuate weight bearing forces and the ability to dissipate compressive, tensile, shearing, and rotational forces during the stance phase of gait.[4] Sixty percent of the gait cycle has been classified as weight bearing, more commonly known as the stance phase of gait.[4] Evidence observed during weight bearing MRI and fluoroscopy indicate the largest contact area occurs during the stance phase of gait, with lower contact at both toe-off and heel strike.[3]

The subtalar joint forms one of the most important articulations in the foot in which subtalar motion is essential in walking on plain surfaces and uneven ground.[5] During normal gait, the subtalar motion alternatively locks and unlocks the midtarsal joints, which allows the foot to act as a rigid lever during push off and as a shock absorber during heel strike and foot flat phases.[5] In subtalar joint kinematics, the talus rolls in a medial direction to fully articulate with the middle facet on the calcaneus, which is identified as the sustentaculum tali. As the posterior aspect of the calcaneus rolls laterally, the sustentaculum falls medially along with the talus. These combined motions have been described as the torque converter for the lower limb and is termed pronation of the subtalar joint.[4]

Patients who undergo lateral ligament reconstruction should expect to actively participate in a rehabilitation program with a progression to full activity within 3 to 6 months.[1] After the procedure, patients are usually immobilized for 4 to 8 weeks in a short leg cast or removable walking boot, dependent on the quality of the repair and soft tissue integrity.[1] When patients begin to weight bear through their operative limb, they typically present clinically with gait impairments, which can relate to pain, limited joint mobility, deficits in muscle strength, disorders of proprioception and balance, and lack of confidence or fear to use the limb.[6]

The use of different foot inserts, orthoses, and shoe modifications can be powerful tools for the management of a variety of foot and ankle pathologies with the goal to restore normal ankle-foot function.[7] Improvement in ankle-foot kinematics can be achieved by designing orthotics to offload high-pressure areas and provide foot control with support. In addition, orthoses can restrict painful motion, compensate for lost motion, provide support, and subsequently improve gait and ambulation. There is evidence to support full foot orthoses with use after immobilization with the three main forms of ankle-foot orthoses being soft, rigid and semirigid. However, evidence is lacking with respect to the use of partial orthoses, such as the inclusion of a lateral eversion wedge after immobilization.[7]

The purpose of this case report therefore is to investigate the impact of the inclusion of a 5/8” lateral calcaneal eversion wedge in regular daily shoe wear in decreasing pain and improving function in a patient post Chrisman-Snook procedure.

Case Description: Patient History and Systems Review

The patient was a 33-year-old female Navy Veteran who underwent a right ankle Chrisman-Snook procedure and was referred to Physical Therapy at 6 weeks post-op. Immediately following surgery, the patient was placed in a short leg cast and discharged from the hospital with axillary crutches and a popliteal sciatic nerve block for pain control. During anesthesia check-in calls on post-op days 1-3, the patient reported daily 10/10 pain on the Numeric Pain Rating Scale (NPRS) and was taken to the emergency department (ED) on postoperative day 3 (POD 3).

In the ED, the patient received a single shot bolus of bupivacaine and the nerve block was subsequently removed without complication. The patient was instructed to maintain non weight bearing (NWB) status for 6 weeks and elevate the leg as much as possible. The patient was referred to outpatient Physical Therapy at 6 weeks post-op with instructions to begin weight bearing as tolerated (WBAT) in cam boot and progress Physical Therapy per the Surgeon's Chrisman-Snook rehabilitation protocol (Appendix A).

The patient goals, established on the Patient Specific Functional Scale (PSFS), were to return to weightlifting and demonstrate the ability to stand for a full 8-hour day of work as a Veterinary Technician. The goal time frame was 10-12 weeks from the initial evaluation, which is 16 to 18 weeks post-op. It was anticipated that the goal to return to weightlifting would be achieved prior to standing for a full day of work.

The patient reported injuring the ankle 1 year prior during a fall down 3 stairs resulting in subsequent ankle pain, edema and instability. Conservative treatment prior to the Chrisman-Snook procedure included the use of a cam boot, lace up ankle brace, and using NSAID therapy without improvement of symptoms. An MRI performed before the surgery revealed tenosynovitis of the peroneal tendons (Image 1) with a short segment tear at the lateral margin of the calcaneus with reconstruction prior to its attachment onto the base of the fifth metatarsal in addition to inflammation of the sinus tarsi with an associated sinus tarsi tenosynovitis of the posterior tibialis tendon and a tear of the anterior talofibular ligament (Image 2).

A review of systems revealed a history of obesity, anxiety, and benign essential hypertension. The patient was taking Nortriptyline to manage pain and anxiety, and was working with a nutritionist to manage weight and hypertension. The patient lives in a 2-story home with her boyfriend, daughter and two dogs.

Clinical Impression #1

Once a complete history of the problem was taken, a systems review performed, and the patient's complaints identified, the initial clinical impression indicated the patient was a good candidate for the intervention. The patient presented to the initial Physical Therapy evaluation wearing a cam boot and using axillary crutches (WBAT) s/p right ankle Chrisman-Snook procedure. No red flags were identified and there were no surgical contraindications to initiating the intervention, however due to the use of the cam boot at the initial evaluation, the intervention was not introduced until the patient was able to ambulate in regular shoes. Initial impression suggested the patient's

primary complaints of pain and limited function were likely due to decreased ankle-foot range of motion (ROM) and altered gait mechanics with increased lateral heel weight bearing in gait. The intervention was appropriate to decrease pain and improve gait mechanics to enable the patient to achieve her goals.

Examination

Observation revealed the patient in no acute distress, wearing a cam boot on her right ankle and ambulating weight bearing as tolerated (WBAT) with axillary crutches. Gait assessment out of the cam boot revealed a lack of dorsiflexion in stance phase, a step-to gait pattern and lateral calcaneal weight bearing upon loading response. The patient's skin appeared clean and dry with a well-healed surgical incision over the lateral ankle. Moderate perimalleolar edema and warmth were noted.
Ankle palpation revealed tenderness over the lateral malleolus, Achilles tendon and peroneal muscles. Atrophy of the gastrocnemius was noted.

Using a standard manual goniometer with the patient in supine, Passive range of motion (PROM) dorsiflexion (DF) measurement of the right ankle was 0 degrees, plantarflexion (PF) 20 degrees, eversion 0 degrees and inversion 5 degrees. The therapist was confident in the accuracy of the measurement obtained since the patient was able to relax the ankle while testing. There is a good test-retest reliability with the use of a manual goniometer with an Intraclass Correlation Coefficient (ICC) range of 0.5 degrees for DF, 0.72 for PF, 0.74-0.9 for subtalar joint eversion and inversion. It is important to note that due to post-op protocol limitations, inversion and eversion PROM was not measured until 10 weeks post-op at the mid-term visit (Table 1).[8]

Next, using a standard manual goniometer with the patient in supine, active range of motion (AROM) measurement of the right ankle was 0 degrees DF, 15 degrees PF, 0 degrees eversion and 5 degrees inversion (Table 2).

Ankle strength was assessed with manual muscle testing (MMT). MMT is an acceptable method of assessment of muscle strength as evidence supports the method to have good reliability and validity with neuromusculoskeletal dysfunctions.[9] MMT was performed by the therapist gradually increasing the amount of resistance until the patient was not able to overcome the resistance. At that point, the therapist graded and recorded the strength for each muscle tested. The MMT grades for Dorsiflexion and Plantarflexion were both 2/5 indicating weakness in the lower extremity. Ankle eversion and inversion MMT was deferred at the initial evaluation due to post-operative precautions (Table 3).

Pain was assessed using the Numeric Pain Rating Scale (NPRS) patient-reported outcome measure in which patients verbally select a number on a scale of 0 to 10 where 0 is “no pain” and 10 is “the most excruciating pain” that is most in line with the amount of pain they have experienced with a given activity in the past 24 hours. The patient stated at rest the pain was a 5/10 and would increase to 9/10 with weight bearing activity (Table 4). The Minimally Clinically Important Difference (MCID) for the NPRS is 2.17/10 for ankle pain indicating the patient must report at least a 2.17/10 numeric decrease in pain for the intervention to result in a meaningful change.[9]

The self-administered Patient Specific Functional Scale (PSFS) was selected to determine primary functional limitations and establish patient goals. The patient can report up to 3 functional limitations and rate each limitation on a scale from 0 to 10 with 0 being unable to perform the activity at all to 10 which is the ability to perform the activity at the same level as before the injury or surgery. The PSFS is not traditionally used as an absolute measure of disability, but rather used as a measure to assess change over time, placing more weight on relative change from baseline.[10] The patient initially reported a 0 for weightlifting and a 0 for standing for a full day of work as a veterinary technician (Table 4).

Clinical Impression #2

Based on the examination, the patient's body function and structure impairments of decreased ankle ROM, decreased strength, pain, edema and altered gait mechanics indicated the patient was a good candidate for the intervention. In addition, the patient's complaints of being limited in weight bearing activities such as weightlifting and standing for work indicated that the use of the intervention could decrease patient symptoms with use for weight bearing activities.

To determine the outcome of the intervention, manual goniometry measurements of range of motion and the gait assessment will be repeated. The NPRS will be used to assess average pain in response to movement and the PSFS will be repeated to assess functional improvement toward achievement of the patient's goals of returning to weightlifting and the ability to stand for a full workday as a veterinary technician. All the

above measurements will be repeated at visit 6, when the 5/8” lateral eversion wedge is introduced into gait with use in the right shoe and again at visit 13, the final visit.

For the intervention to be successful, PROM and gait mechanics should improve along with decreased pain on the NPRS and improved numeric rating on the PSFS. The patient should report improvement in function and demonstrate the ability to ambulate without an assistive device.

Intervention

The patient participated in face-to-face Physical Therapy sessions with the same Physical Therapist once a week for 18 weeks. Once the patient was able to ambulate in regular shoes at visit 6, the treatment emphasis was to decrease pain and improve function with the use of a 5/8” lateral calcaneal eversion wedge worn daily in the right shoe (Image 3). In a study by Sangeorzan regarding subtalar joint mechanics, when the hindfoot is positioned in inversion, there is significantly less contact area in the posterior facet but the same ratio of high-pressure contact area to total contact area.[11] In weight bearing, the patient demonstrated an inverted hindfoot position which was corrected into a more neutral or everted hindfoot position by using the 5/8” lateral calcaneal eversion wedge.

The patient was instructed to wear the eversion wedge in the right shoe daily. The patient continued the use of the wedge for the next 12 weeks making a total of 18 weeks with use of the lateral calcaneal eversion wedge. It is important to note that the patient missed 5 visits of Physical Therapy within the 18-week timeframe, however she

wore the 5/8” wedge in her shoe daily during that time. Additional treatments during Physical Therapy visits included therapeutic exercise and joint mobilization of the talocrural and subtalar joints. The progression of rehabilitation followed the protocol depicted in Appendix A. This included therapeutic exercise, balance and proprioceptive exercise, gait training, and manual therapy.

Outcome

Outcome measures were repeated at week 6 and week 18. For the Numeric Pain Rating Scale (NPRS), the patient improved from the initial evaluation at 5-9/10 pain rating to 4-7/10 pain rating. At the 18-week visit, the patient reported 1-2/10 pain. Both the mid-term and final visit demonstrated clinically significant changes as the MCID for the NPRS is 2.17.

For the Patient Specific Functional Scale (PSFS) goal of returning to weightlifting, the patient reported an improvement from 0/10 at the initial evaluation to 4/10 during the 6-week visit. At the 18-week visit, the patient improved again, reporting a 9/10 on the PSFS with the goal of returning to weightlifting. For the PSFS goal of returning to a full 8- hour day of work as a Veterinary technician, the patient initially reported a 0/10 on examination, followed by a report of 2/10 at the 6-week follow up and finally a 9/10 at the final visit. This demonstrates a clinically significant change as there was a positive shift of 9/10 from baseline.

Discussion

The purpose of this case report was to investigate the impact of the inclusion of a 5/8” lateral calcaneal eversion wedge in regular daily shoe wear in decreasing pain and improving function in a patient post Chrisman-Snook procedure. The Chrisman-Snook procedure is a non-anatomical lateral reconstruction that improves ankle instability in patients who have failed conservative treatment for chronic lateral ankle instability.[1] Following the immobilization period during the post-operative healing phase, patients typically demonstrate decreased ankle range of motion, decreased lower extremity strength and demonstrate gait deviations. The patient was selected to evaluate the functional outcome following Physical Therapy intervention Chrisman-Snook procedure.

Following 18 weeks of Physical therapy at a rate of one time per week, the emphasis after week 6 was on the inclusion of a 5/8” lateral calcaneal eversion wedge to be worn in the right shoe daily. The patient demonstrated significant improvement in and function as evidenced by Numeric Pain Rating Scale (NPRS) and Patient Specific Functional Scale (PSFS) scores.

The patient’s pain improved from 5/10 at rest and 9/10 with weight bearing at the initial evaluation, to 1/10 at rest and 2/10 with weight bearing by the final visit. This demonstrates a clinically significant change as the MCID for the NPRS is 2.17.

In addition, the patient went from 0/10 on both PSFS established goals (weightlifting and completing a full 8-hour workday as a Veterinary technician) at the initial evaluation,

to 4/10 and 2/10 respectively by week 6 and finally 9/10 for both goals by the final visit. These numeric ratings demonstrate a positive trend from initial visit to final visit.
The patient's outcomes support the rationale behind using a 5/8" lateral calcaneal eversion wedge in daily shoe wear s/p Chrisman-Snook procedure.

Although this case study demonstrated positive results with the specified intervention, further research is recommended to validate the use of a calcaneal eversion wedge s/p Chrisman-Snook procedure, and potentially extrapolate the use of a wedge to include patients s/p immobilization for other diagnoses such as ankle fractures, Achilles repair or open reduction internal fixation.

References

1.Digiovanni C, Brodsky A. Current Concepts: Lateral Ankle Instability. *Foot and ankle international*. 2006;27(10): 854-866.

2.Peters W, Trevino S, Renstrom P. Chronic Lateral Ankle Instability. *Journal of Foot and ankle surgery*. 1991;12(3): 182-191.

3.Brockett C, Chapman G. Biomechanics of the ankle. *Orthopaedics and Trauma.* 2016;30(3): 232-238.

4.Donatelli, R. Normal biomechanics of the foot and ankle. *Journal of Orthopaedic and Sports Physical Therapy*. 1985. 0196-6011/85/0703-00091.

5.Dhillon S, Dhillon MS, Arumugam S, Gowda PK, Chabbra M, Kumar P. Foot biomechanics and relation to the gait cycle. *J Foot Ankle Surg* (asia Pacific) 2018;5(2): 68-72.

6.Keene D, Willett K, Lamb S. The immediate effects of different types of ankle support introduced 6 weeks after surgical internal fixation for ankle fracture on gait and pain: A randomized crossover trial. *Journal of Orthopaedic and Sports Physical Therapy.* 2016;46(3): 157-167.

7.Elattar O, Smith T, Ferguson A. Uses of braces and orthotics for conservative management of foot and ankle disorders. *American orthopaedic foot and ankle society*. 2018; 1-12.

8. Elveru R, Rothstein J, Lamb R. Goniometric reliability in a clinical setting: Subtalar and ankle joint measurements. *Physical Therapy.* 1988;68(5):672-677.

9.Cuthbert S, Goodheart G. On the reliability and validity of manual muscle testing: a literature review. *Chiropr Man Therap*. 2007;15(4). Doi.org/10.1186/1746-1340-15-4.

10. Nicholas P, Hefford C, Tumilty S. The use of the Patient-Specific Functional Scale to measure rehabilitative progress in a physiotherapy setting. *Journal of manual and manipulative therapy.* 2012;20(3): 147-152.

11.Sangeorzan A, Sangeorzan B. Subtalar joint biomechanics: from normal to pathologic. *Foot Ankle Clin N Am* 23 (2018) 341-352. https://doi.org/10.1016/j.fcl.2018.04.002.

12. Hoppenfeld S. *Physical Examination of the Spine and Extremities*. New York, NY: Prentice Hall: 2019.

Table 1.

Summary of PROM measurements for a 33-year-old woman after a Chrisman-Snook procedure.

	Involved Ankle (Right)			Uninvolved Ankle (Left)		
	Initial	Mid-Term	Outcome	Initial	Mid-Term	Outcome
Dorsiflexion	0	15	20	20	20	25
Plantarflexion	20	30	40	40	40	40
Inversion	NT	10	15	55	55	55
Eversion	NT	4	10	15	15	20

**NT = Not Tested

Table 2.
Summary of AROM measurements for a 33-year-old woman after a Chrisman-Snook procedure.

	Involved Ankle (Right)			Uninvolved Ankle (Left)		
	Initial	Mid-Term	Outcome	Initial	Mid-Term	Outcome
Dorsiflexion	0	10	20	20	20	25
Plantarflexion	15	25	40	40	40	40
Inversion	5	5	10	50	50	50
Eversion	0	2	10	15	15	20

Table 3.

Summary of strength measurements for a 33-year-old woman after a Chrisman-Snook procedure.

	Involved Ankle (Right)			Uninvolved Ankle (Left)		
	Initial	Mid-Term	Outcome	Initial	Mid-Term	Outcome
Dorsiflexion	2/5	4/5	5/5	5/5	5/5	5/5
Plantarflexion	2/5	3/5	5/5	5/5	5/5	5/5
Inversion	NT	3/5	5/5	5/5	5/5	5/5
Eversion	NT	4/5	5/5	5/5	5/5	5/5

**NT = Not Tested

Muscle Grading:[12]

0 – No evidence of contractility

1 – Evidence of slight contractility, no joint motion

2 – Complete range of motion with gravity eliminated

3 – Complete range of motion against gravity

4 – Complete range of motion against gravity with some resistance

5 – Complete range of motion against gravity with full resistance

Table 4.

Summary of Outcome Measure Scores for a 33-year-old woman after a Chrisman-Snook procedure.

	Initial	Mid-Term	Outcome
NPRS	5-9/10	4-7/10	1-2/10
PSFS - Weightlifting	0/10	4/10	9/10
PSFS – stand for full workday as Vet Tech	0/10	2/10	9/10

NPRS MCID = 2.17
PSFS Minimal Detectable Change (90% CI) for single activity score = 3 points

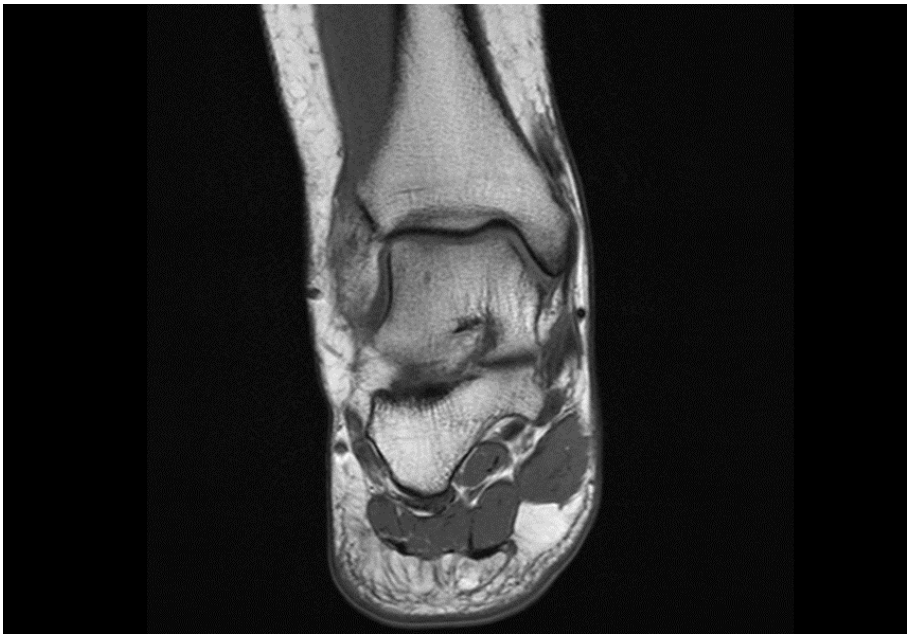

Image 1 (above): T1 weighted image (coronal view) demonstrating tenosynovitis of the peroneal tendons.

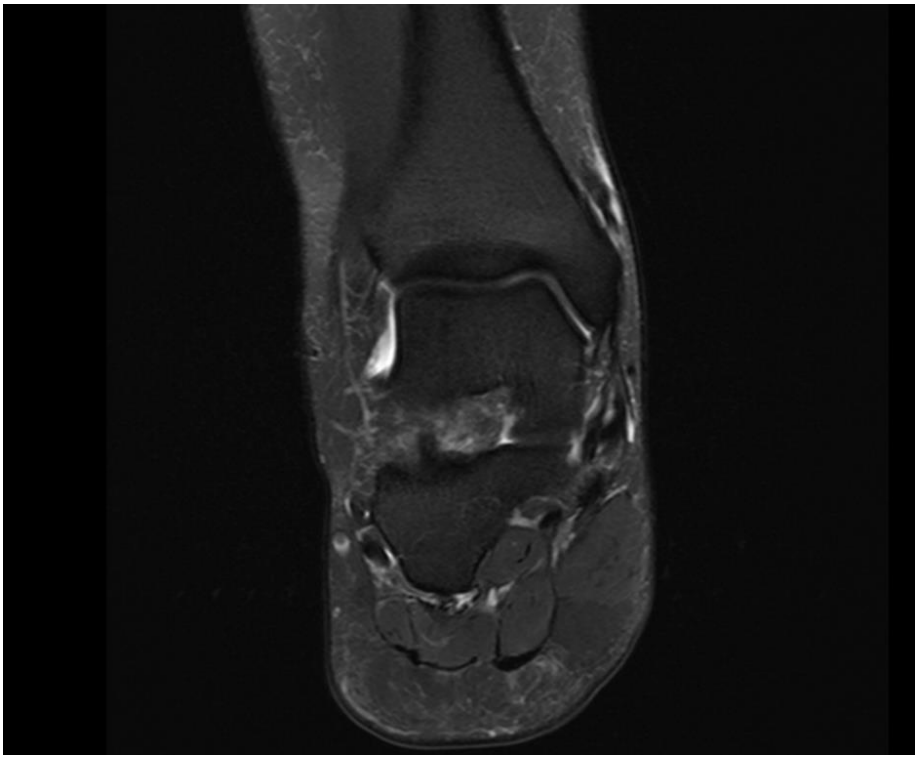

Image 2 (above): T2 weighted image (coronal view) demonstrating complete tear of the ATFL.

Image 3: 5/8” lateral calcaneal eversion wedge.
For illustration purposes, picture depiction is of the author’s right foot.

Appendix A

Rehabilitation Guidelines for Chrisman-Snook Procedure

PHASE I (Surgery to 6 weeks after surgery)

Appointments	2 weeks and 6 weeks after surgery, the patient is seen by the surgeon. The patient should begin Physical Therapy within 3-7 days of the 6-week surgeon visit.
Rehabilitation Goals	Protection of the post-surgical ankle
Precautions	Non-weight bearing until the 6-week surgeon visit, then weight bearing as tolerated
Range of motion (ROM) Exercises	No range of motion at this time, unless specified by surgeon
Suggested Therapeutic Exercise	4-way straight leg raise Full arc quad sets Abdominal isometrics Planks from knees
Cardiovascular Fitness	Upper body ergometer

Phase II (begin 6 weeks after surgery)

Appointments	Rehabilitation appointments are one time per week for 4 weeks
Rehabilitation Goals	Continued protection of the repair 75% of full active range of motion Total leg strength to permit transition to weight bearing Wean out of boot to an ankle stabilizing orthoses (ASO) as needed
Precautions	No inversion or eversion range of motion to protect the repair Progressive and gradual return to weight bearing
Range of motion (ROM) Exercises	Active and active assistive range of motion for ankle plantarflexion and dorsiflexion Active and active assistive range of motion for forefoot and toe mobility
Suggested Therapeutic Exercise	Ankle isometric strengthening in neutral Double leg balance exercises Standing 4-way straight leg raises Planks from feet – forward and lateral
Cardiovascular Fitness	Upper body ergometer, gentle stationary bike, progressive walking program

Phase III (begin after meeting Phase II criteria, usually 10-12 weeks after surgery)

Appointments	Rehabilitation appointments are 1 to 2 times per week
Rehabilitation Goals	Full active range of motion in weight bearing and non-weight bearing positions MMT 5/5 strength of ankle MMT 5/5 hip strength Normal gait mechanics
Precautions	No jumping, hopping or impact sports ASO to protect repair as needed outside of PT appointments
Suggested Therapeutic Exercise	Ankle strengthening exercise progression Balance progression Gait drills/training Gentle stretching as needed to regain full range of motion
Cardiovascular Fitness	Walking, biking, stairmaster and elliptical