



Amniotic Allograft Reduces Joint and Soft Tissue Pain

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Background

- Foot pain is one of the most common orthopedic complaints; it affects more than 1 million people per year.¹ The diagnosis of foot pain is based on the patient's symptoms, which are characterized by classic signs of inflammation—pain, swelling, and loss of function.¹
 - Foot pain can be caused by repeated trauma or overuse that creates microtears in the affected joint, concurrently damaging the immediate surrounding soft tissue.^{2,3}
 - Common treatment options available for foot pain include rest, stretching exercises, orthotics, cryotherapy, oral analgesics, corticosteroid injections, phonophoresis, and local injections of platelet-rich plasma.⁴⁻⁶
 - Human amniotic membrane has been used in a variety of clinical applications for over 100 years.⁷⁻¹²
 - In vivo and in vitro studies have shown that the biochemical properties of amniotic membrane help to reduce inflammation and enhance soft tissue healing.^{11,13}
- Micronized Dehydrated Human Amnion/Chorion Membrane (mDHACM)**
- PURION® Processed dehydrated human amnion/chorion membrane allografts contains growth factors that help in wound healing and are available in a variety of sizes and configurations including a micronized form.
 - A treatment that reduces inflammation of soft tissues and nerves, and that allows for rapid return to pain-free activities is highly desirable and the basis for the use of mDHACM. The ability to inject mDHACM allograft allows treatment of deeper soft tissue injuries rather than surface wounds alone.

Purpose

- The purpose of this case review is to present the use of injectable mDHACM allograft to help reduce pain and enhance healing in patients with foot and ankle pain.

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Methods

- With Publication Review Committee approval we conducted a retrospective analysis of 6 patients, 3 with foot and ankle joint pain and 3 with plantar fasciitis pain, that received injectable mDHACM.
- Patients included had received conservative treatment consisting of rest, ice, compression, corticosteroid injection, stretching exercises, NSAIDs, and orthotics for more than 8 months with little to no pain relief as measured on the Wong-Baker Visual Pain Analog Scale.
- None of the included patients had prior surgery at the injection/joint site; clinical signs of site infection; prior treatment with tissue engineered material; presence of foot and ankle orthopedic comorbidities such as a foot/ankle stress fracture, known nerve entrapment syndrome, neurological disease of the feet; or inability to ambulate.
- Patients were required to have a Doppler ankle-arm index (AAI) >0.7.
- Using ultrasound-guided assistance to visualize the anatomy, reconstituted mDHACM (with normal saline 1.5 mL) was injected at the site of pain. All patients received a single-dose injection of mDHACM.
- The treated foot was then wrapped with a soft cast paste boot and the patients provided a postoperative shoe with instructions to remove the shoe in 24 to 48 hours, and then return to usual footwear.
- The Wong-Baker FACES Pain Rating Scale was used to rate average pre-injection pain from 0 (no hurt) to 10 (hurts worst), as well as the pain 8 weeks after the injections.

Results

- All patients experienced reduced pain on ambulation two weeks post injections of mDHACM, and were able to return to their daily activities.

Table 1. Summary of Cases.

Case	Gender/Age	Chief Complaint/Radiographic Studies	Pre-Tx Pain Score	Post-Tx Pain Score
1	M/57	Chronic left ankle pain; MRI showed a partial tear involving the left peroneus brevis, and tenosynovitis involving peroneus longus tendons; left ligament sprains in the medial collateral ligaments, as well as at the lateral calcaneofibular and calcaneal talar ligaments	6	1-2
2	F/40	Right foot pain; MRI showed tenosynovitis of the flexor tendon of the 3rd digit at the level of the proximal phalanx	6	1
3	M/45	Chronic right foot plantar fasciitis; X-ray demonstrated a plantar calcaneal spur and increased radio opacity of the plantar fascia at its insertion to the calcaneus	8	3
4	F/37	Chronic right foot plantar fasciitis; X-ray demonstrated a plantar calcaneal spur and increased radio opacity of the plantar fascia at its insertion to the calcaneus	5	3
5	M/50	Chronic right foot plantar fasciitis; X-ray demonstrated a plantar calcaneal spur and increased radio opacity of the plantar fascia at its insertion to the calcaneus	8	3
6	M/54	Right ankle pain; MRI demonstrated tendinitis involving the peroneal tendons with partial tear of the peroneus brevis; partial thickness tears and soft tissue injury involving lateral collateral ligaments	8	3

Wong-Baker FACES Pain Rating Scale: 0 (no hurt) to 10 (hurts worst); Tx = treatment.

Case 1



Figure 1. Ultrasound view of left ankle peroneal tendinitis pre-injection (circled).



Figure 2. Ultrasound view of left ankle peroneal tendinitis 9 months after injection (circled).

Case 2



Figure 3. Ultrasound view of right 4th plantar plate tear pre-injection (circled).



Figure 4. Ultrasound view of right 4th plantar plate tear 5 months after injection with mDHACM suspension (circled).

Case 3

Figure 5a. Ultrasound longitudinal view of plantar fascia medial band asymptomatic at the medial calcaneal tubercle (MCT) note area marked 1.

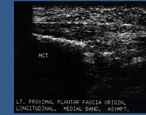


Figure 5b. Ultrasound longitudinal view of plantar fascia medial band symptomatic at the medial calcaneal tubercle (MCT) note area marked 1.



Conclusions

- Although corticosteroids may temporarily relieve pain, the amniotic membrane product, containing growth factors that potentially aid in tissue healing, achieved the same results.
- Although there are many possible treatments for pain, no single treatment can be guaranteed based on quality of life measures that include comorbidities (obesity, diabetes), medication use, and lifestyle factors (smoking, malnutrition).
- Further work is needed to better assess the use of mDHACM within current treatment guidelines for the management of foot and ankle pain.

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