Signaling Regeneration with Umbilical Cord Tissue

Science, Surgery, & Changing the Algorithm

Thuy Ho-Ellsworth, DPM, FAMIFAS

ALIGN Foot & Ankle, PLLC

Austin, Texas

Why Regeneration Matters in Foot & Ankle Care

High Mechanical Demand

High mechanical demand + limited soft tissue envelope

Poor Vascularity

Poor vascularity in many foot & ankle structures

Traditional Limitations

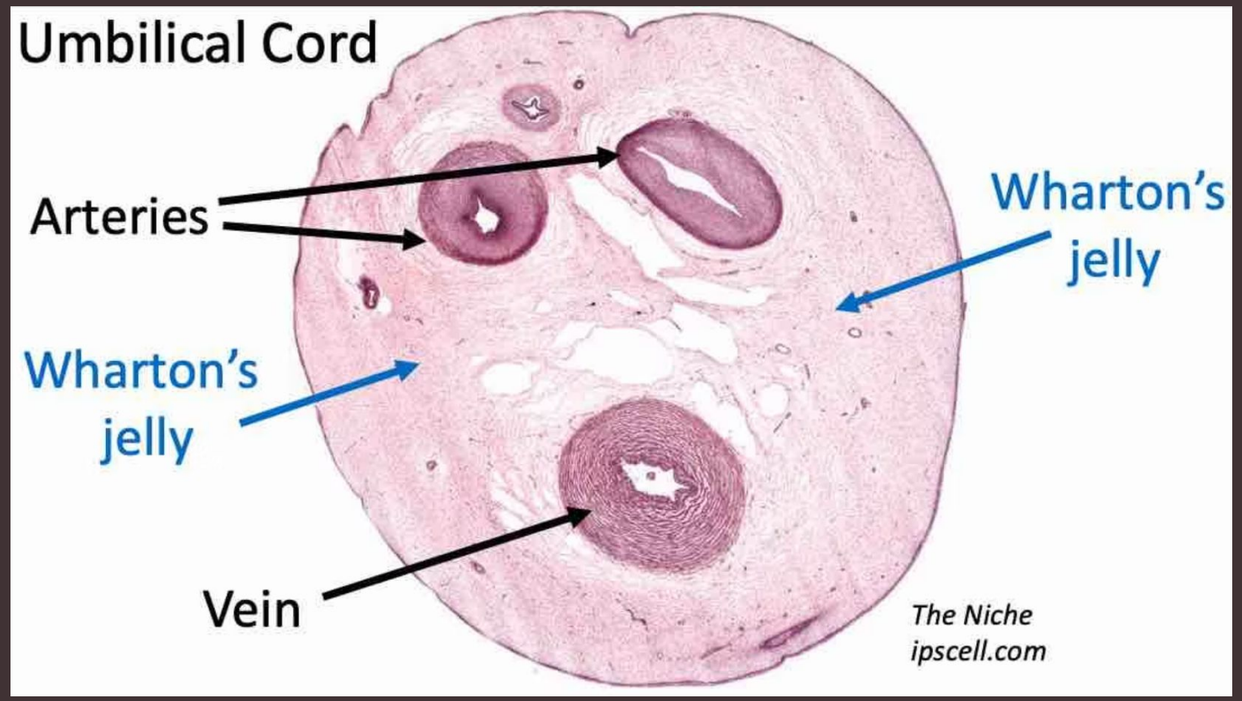
Traditional surgery addresses structure, doesn’t optimize biology

Regenerative medicine maximizes healing signals

What Is Umbilical Cord Tissue Allograft?

Human umbilical cord–derived tissue
Rich in **Wharton's jelly**

- Growth factors
- Cytokines
- Extracellular matrix (ECM)
- Hyaluronic acid



So much more than just stem cells

→ Signaling and Scaffolding Tissue

Safety & Processing – Why This Matters

01

Donated from full-term, healthy births

02

Thorough donor screening

03

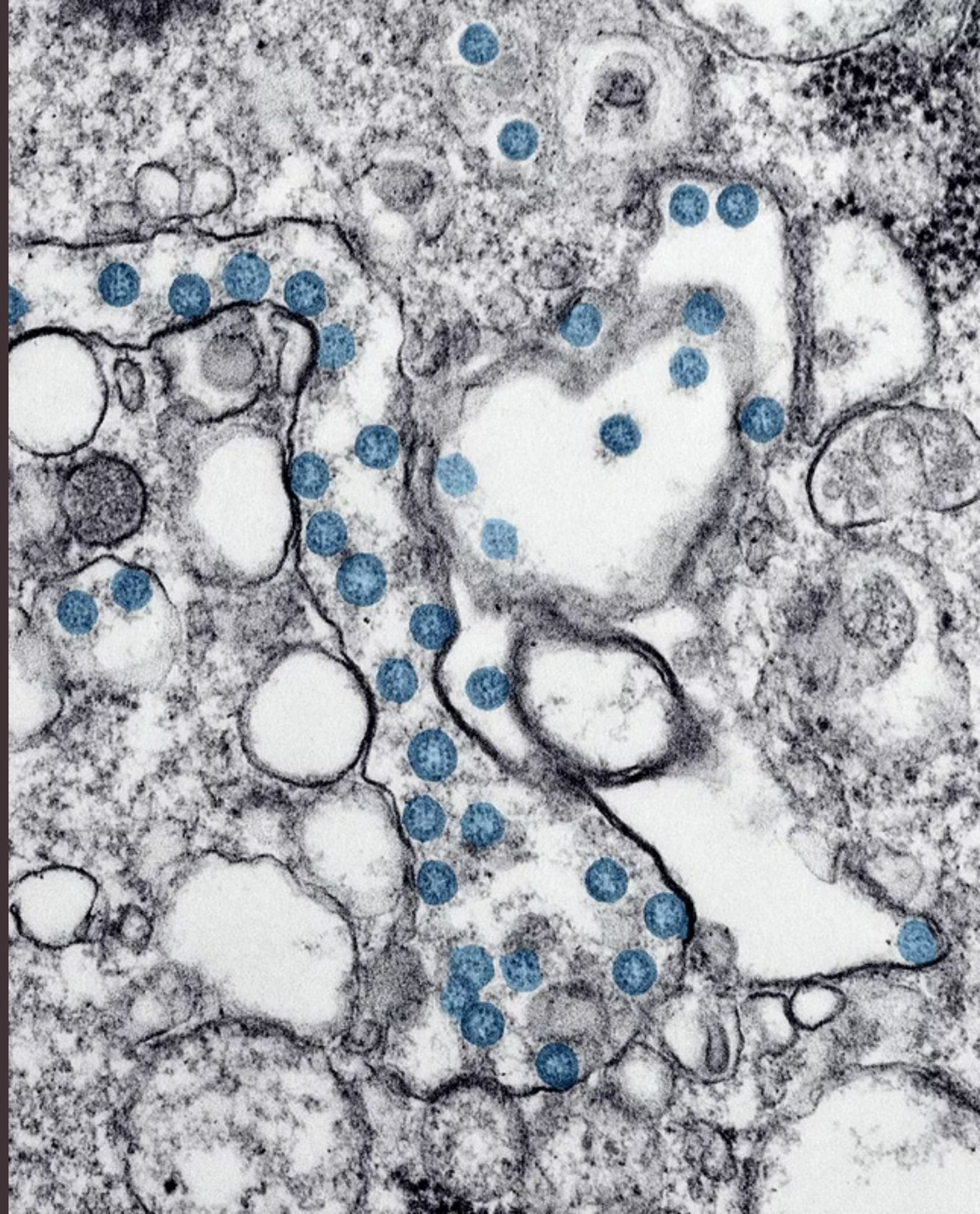
Sterile, regulated processing

04

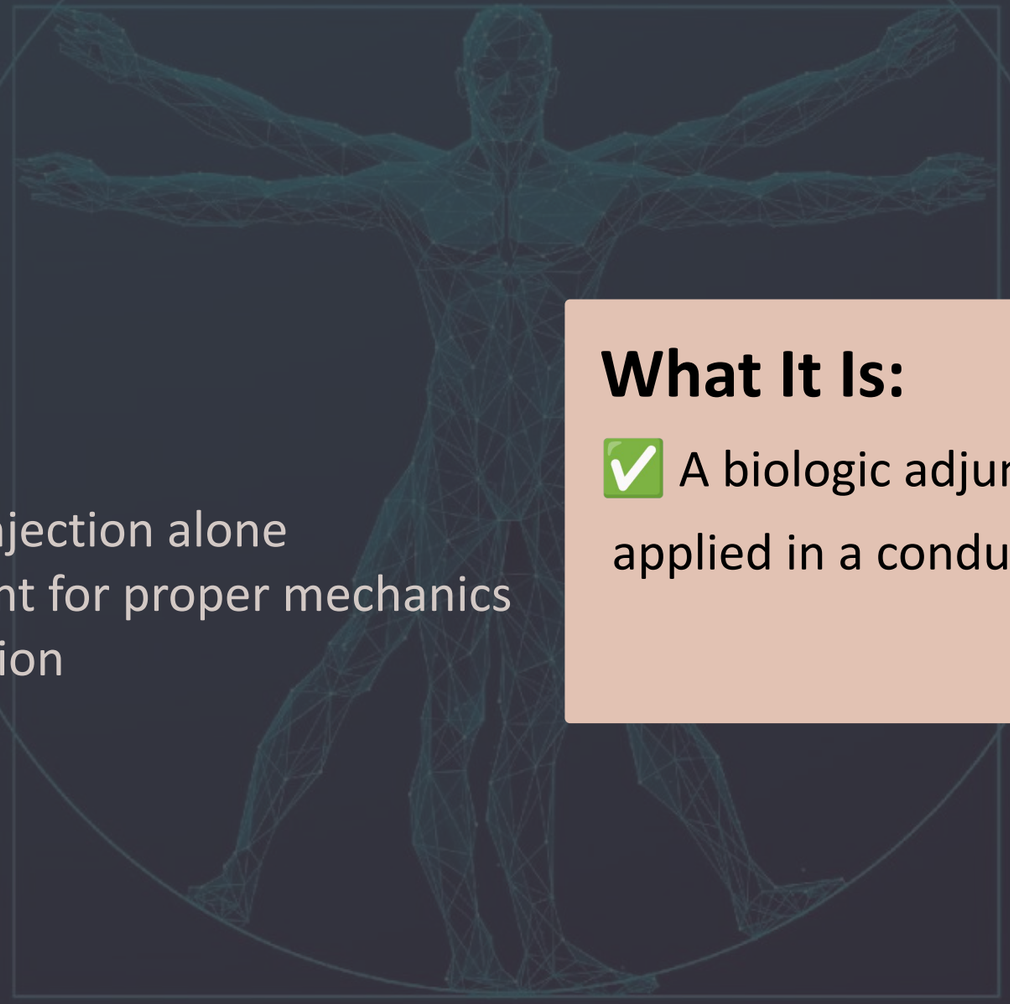
Proper FDA Registration (HCT/P 361)

Wharton's Jelly: The Biologic Guide to Healing

- Highly hydrated ECM
  - Natural shock-absorbing and protective role
- Modulates inflammation (↓ chronic inflammatory cascade)
- Promotes angiogenesis
- Supports fibroblast and osteoblast activity
- Provides a biologic scaffold for repair
- Enhances soft tissue and bone healing



What Umbilical Cord Tissue Is *Not*



Not:

❌ Not stem cell therapy
❌ Not just a growth factor injection alone
❌ Not a shortcut replacement for proper mechanics
❌ Not a treatment for infection

What It Is:

✅ A biologic adjunct to optimize healing when applied in a conducive environment

Where UCT Fits – Guided by Patient Goals

Applications

- Plantar fasciosis
- Chronic tendinopathy
- Ligamentous injuries (ATFL/CFL)
- Degenerative joint pathology
- Acute fractures

Delivery

- Percutaneous ultrasound-guided or fluoroscopic guided injection
- Layer-specific application (tendon, capsule, periosteum)

***TREATMENT DECISIONS ARE GUIDED BY TISSUE QUALITY AND PATIENT GOALS**

From Biology to the Bedside

- 56 year old male with insertional achilles tendon pain presents for 3rd opinion- Limping, swollen and in pain and his daughter's wedding in 3 weeks.
- 8/10 pain and after a series of shockwave/laser and biologic.
  -> 2/10 pain

- Was able to dance at his daughters wedding.

From Biology to the Bedside

Case Study: Freiberg's Infarction

- **59-year-old male** with history of arthritis
- **Dx:** Freiberg’s infarction (RIGHT foot), metatarsalgia
- Chronic RIGHT foot pain with worsening over 2–3 months; sharp, shooting pain with ambulation and toe dorsiflexion
- MRI confirmed Freiberg’s infarction
- **Attempted treatment:** walking boot + 6-week observation for spontaneous healing (insufficient relief) → sought second opinion
- **Exam: 9/10**: 2nd MTP tenderness (plantar > dorsal), pain with passive dorsiflexion; partial syndactyly 2nd–3rd toes
- **09/15: Biologic implantation**
- **10/23:** 80–85% improvement after biologic injection
- **10/30:** Marked improvement post-injection; resolution of morning pain, improved standing/walking; mild pain only with long walks which was resolved with CMOs and shoes

From Biology to the Bedside

Case Study: Jones Fracture

- 28 y/o male with residual club foot deformity
- Opted not to have surgery due to foot structure and high risk of complications
- Biologic implantation under fluoroscopy + Bone stimulator with complete healing in 6 weeks.

How I Integrate Regeneration Surgically: With Patient Expectations in Mind

Intra-operative placement

- Minimally invasive surgery (soft tissue healing support)
- Osteotomy and joint salvage procedures
- Tendon debridement and repair
- Ligament repair or augmentation
- Scar modulation in revision surgery

Post-operative biologic signaling enhancement

- Early inflammatory and proliferative phases

My Starting Point - What I Kept Seeing

- Traditionally trained
- Hospital-based employment
- Practiced conventional foot & ankle care
- Conservative care → surgery
- Chronic pain cycles
- Degenerative tissue treated as inflammation
- Steroids weakening tendon and cartilage
- Surgery fixed structure, not tissue quality

Changing the Algorithm – In My Practice

- Left a hospital based model --> Became an associate in a Private Practice
- Clinical decisions were limited by those systems
- I felt boxed into a conventional pathway

I chose to build a practice around how I believe medicine should be practiced

Building Align Foot & Ankle

Opened private practice with intention

Introduced regenerative options early

Let patient outcomes guide growth

Clinical Outcomes: What I Started Seeing

- Reduced post-procedure pain
- Improved tissue quality
- Faster return to function
- Less stiffness and scar burden
- Enhanced patient satisfaction

The Gap

Waiting until failure

Limited options between "wait" and "operate"

Healing assumed, not optimized

Why I Was Willing to Do Things Differently

- Not commonly offered in my community
- Not insurance-driven decision-making
- More afraid of continuing a system that wasn’t serving patients

The Belief

Believing patients deserve more options

How I Use Umbilical Cord Tissue Now

Multimodal Integration

Integrates seamlessly with laser, shockwave, PBM

- Shockwave therapy for mechanotransduction
- Class IV laser for mitochondrial activation
- Umbilical cord tissue for signaling & scaffolding
- Red light therapy for cellular recovery

Biomechanical Foundation

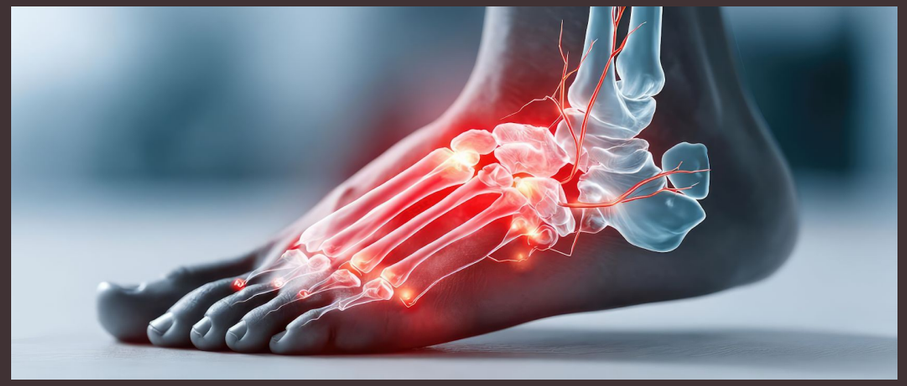
Pair with proper offloading and biomechanics

Surgical Synergy

Combine with MIS techniques

Patient Partnership

Patient education and expectation is essential



The Ideal Patient In My Practice

- Chronic soft tissue pathology
- Surgical patients wanting optimized healing
- Failed conservative care elsewhere
- Patients align with regenerative philosophy
- Active patients seeking tissue preservation & faster recovery

The best treatment should not be reserved as the last stop on the elevator

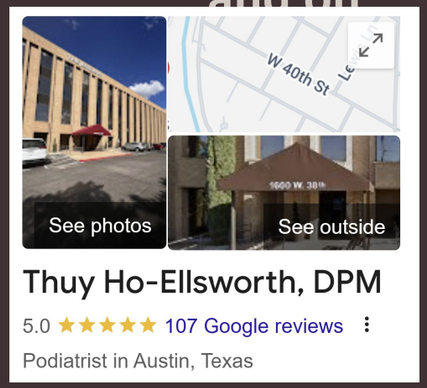
What Changed When I Stopped Masking – and Started Healing

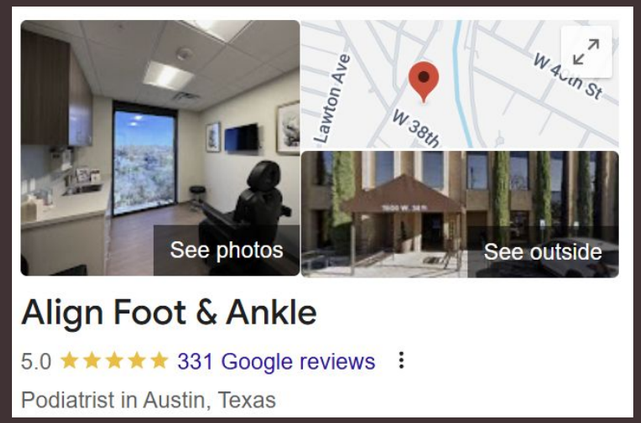
- Improved tissue quality
- Decrease in need for surgery
- Less post-operative stiffness
- Faster return to activity
- Increase treatment options and tools
- Higher Patient Satisfaction

Renewed my passion for medicine

What Happens When You Build a Practice Around Healing

1. Left hospital-based practice intentionally
2. Built a regenerative-focused model
3. Shift from volume to value
4. Patients sought us out
5. Consistent 7-figure growth since year one and on
6. 5-star patient experience





Closing: Signaling Regeneration Is the Future

Patients want options

Physicians want better healing — not just repair

Biology can't be an afterthought

Regeneration bridges the gap

This is the future of foot & ankle care