Decompression: Western Perspective

Treatment Targets:
1. Mechanical connective tissue change
2. Trigger Points
3. Myofascial Lines
4. Scar adhesions, scar tissue
5. Upper crossed/Lower crossed syndromes: hypertonic groups
Integument

Skin layers
Epidermis: thin skin

Epidermis: thick skin
Fascial Layers

- Superficial
- Deep = Aponerotic & Epimysial
  - TLF, TFL, rectus sheath...
- Intermuscular
- Visceral

Skin: more complex than we learned
Fascia is analogous to...

Functions of muscles

- We learn action, but as we move in real world multiple functional pulls for each muscle
  - ERs become IRs past 90 degrees
Connective tissue development

- Ectoderm and Mesoderm gives rise to the CT of skin and fascia above and around muscle tissue.

Paratendonitis/osis

Periostitis
Fascial Components

- **Fibroblasts**
  - Make and secrete all fibers of areolar connective tissue

- **Collagen fibers**
  - Strongest and most abundant; cross linking leads to immense tensile strength

- **Elastic fibers**
  - Rubber like proteins which allow tissue to return to original shape

- **Reticular fibers**
  - Connect vessels and nerves; have more give than collagen

- **Ground substance**
  - Extracellular matrix that holds interstitial fluid via sugar-protein molecules that soak fluid like a sponge; with increased inflammatory response it becomes more viscous

The Colloidal Matrix
Viscoelastic properties of skin

REMEMBER: THIS IS FASCIA

Living tissue is hydrated and dynamic
Fascial Contributions

- Support structure, tension, and suspension for tissues; “scaffolding”
- Fluid mobility; high amount of plasticity
- Connecting multiple muscles = functional kinetic chain

Viscoelastic properties: Collagen

- Dermis is made up of 80% collagen, dry weight, and of that collagen, 85% is type I
- Type 3 collagen is ~15% of dermal collagen, but is higher in immature tissue
- With age, ratio of type 1:3 collagen increases
- Increased collagen fiber density with age = decreased ground substance space
Viscoelastic properties: Ground substance – with GAGs

- Glycosaminoglycans
  - Proteoglycans and repeating disaccharide units
  - Commonly hyaluronan and chontratin sulfate; including dermatan sulfate
  - Bind water in normal healthy tissue
  - In aged skin, less binding to water and bind more to elastic material = thickened

Viscoelastic properties: Thixotropic Effect

- **Thixotropy** is the property of certain gels or fluids that are thick (viscous) under normal conditions, but flow (become thin, less viscous) over time when shaken, agitated, or otherwise stressed.
Viscoelastic properties: Creep and Hysteresis

- Creep is the distortion of tissues as a function of pressure over time.
- Hysteresis is the exchange of heat and energy as tissues are distorted; permanent deformation. Microtrauma.
- With MFR 90-120 seconds is the time for generally the first barrier (R1) to release and push into new range of extensibility.
- Tendon Hysteresis in 5-10 minutes (Kubo 2001)

What really happens when we stretch?

- Sensory endpoint theory (Weppler & Magnusson 2010)
  - Very little evidence that Torque/angle curves shift; even w/ 8 weeks
  - More likely that the perception of the stretch sensation occurs later in the application of similar force
  - PF stretch doesn’t change reflex pathway (Hayes 2012)
Stretching

Soft tissue mobility: Folding

- CT ability to compress upon itself
- Shoulder Elevation= inferior capsule and axillary fold stretched, but also superior and anterior structures need to fold

- parallel fiber arrangement demonstrates more elastic qualities, improved mobility