

# SCAR TISSUE

RATTRAY PG. 243

# DEFINITION:

A collagen based tissue that develops as a result of the inflammatory process

## Causes

- The inflammatory response that results from wound, burns, musculoskeletal trauma, inflammatory arthritides or late stages of osteoarthritis (after cartilage is destroyed)
- Prolonged immobilization of a structure
- Paralysis of a structure due to a peripheral or central nervous system lesion

# TYPES:

- Contracture is shortening of connective tissue supporting structures over or around a joint
  - A contracture should not be confused with a muscular contraction (muscle develops tension as it shortens (concentric) or lengthens (eccentric))
- Adhesion occurs when reduced motion at a joint allows cross links to form among collagen fibres, further reducing the range of motion
  - This is most evident when tissue is left in a shortened position for a prolonged period of time

# TYPES:

- Scar Tissue Adhesion occurs with an injury or an acute inflammatory process
  - Collagen formation during tissue repair allows adhesions and contractures to form in random patterns
  - These adhesions in injured and surrounding tissue reduce range of motion
- Fibrotic Adhesions occur within ongoing chronic inflammation
  - Can cause moderate to severe restrictions in range of motion (difficult to eradicate)

# TYPES:

- Irreversible Contracture occurs when fibrotic tissue or bone replaces muscle and connective tissue
  - There is a permanent loss of range of motion that can only be restored by surgical means
- Proud Flesh is a term that refers to the thick dermal granulation tissue that results from an abnormal healing process
  - When a wound doesn't re-epithelialize there is chronic inflammation, the resulting granulation tissue is composed of collagen and capillaries and in turn gives a raised, red structure that is susceptible to damage

# TYPES:

- Hypertrophic Scarring is an over growth of the dermal tissue that remains within the boundaries of the wound
  - The collagen fibres are randomly organized in nodular patterns
  - These areas must be removed surgically and then replaced with skin graft
- Keloid is dermal scar tissue that extends beyond the boundaries of the original wound
  - Is thought to contain increased amounts collagen in a more random pattern than hypertrophic scars
  - May continue to grow for many years
  - Do not respond well to surgical excision as they often return
  - Steroid are commonly injected to help reduce keloid scarring

# HYPERTROPHIC AND KELOID SCARS

- are most prominent in darker pigmented people such as those from Asian or Black ancestry.
  - 88 % of these scars are in young people under the age of 30.
  - hypertrophic scar tissue is most likely to appear on the sternum, upper back, shoulder deltoid area, buttocks and dorsal surface of the foot.
  - Keloid scars are most likely to appear from ear level to the waist and from shoulder to the elbow.

# EFFECTS OF MASSAGE ON SCAR TISSUE

- Removal of edema is important because collagen fibres can form in the edema
- Massage has been found to soften scar tissue by freeing restrictive fibrous bands and increasing circulation
- Stretching scar tissue after treatment is essential
- Helps desensitize hypersensitive scars through tactile stimulation
- Relaxes the client and decreasing pain
- Massage performed before the collagen matures can prevent hypertrophic scarring

# CONTRAINDICATIONS:

- Frictions are contraindicated if the client is taking anti-inflammatory medications
- Frictions are not recommended for proud flesh or keloid scars

# TREATMENT:

## ASSESSMENT:

- Observations
  - Edema in early stages but could persist in later stages
  - Redness and raised scar in early stages, flatter and pale with time
  - Scar tissue is avascular and has no hair or sweat glands
  - Postural dysfunction can result from presence of scar tissue, could be due to adhesions

## ASSESSMENTS:

- Palpation
  - Scar tissue and adhesions are thick hard areas
  - Could be cool to touch due to ischemia
  - Disuse atrophy may be present in affected muscles

## ASSESSMENTS:

- Testing
  - AF and PR ROM will likely reveal reduced range of motion and possible pain in joints and muscles affected
  - AR testing reveal weakness in affected muscles

# MASSAGE:

- Pre-Treatment Hydrotherapy
  - Applications of heat, such as paraffin wax or hydrocollator are used with maturing scar tissue
- Positioning
  - Is for client comfort and accessibility of tissue to be treated
- Create a mobile and functional scar
  - Rigid and restricted area at the periphery of the scar are treated first
  - Techniques should create a torsion on restricted area
  - Fascial techniques are performed
  - Cross fibre frictions are used on the remaining adhesions
- All techniques are done within the client's pain tolerance
- Massage to scar is always followed by passive stretch (alignment of fibres)
- Post-Treatment Hydrotherapy
  - Cold hydrotherapy after frictions and other techniques that create prolonged hyperemia

# SELF-CARE:

- Pain free movement is performed as soon as possible after injury (early stages – partial range of motion, ranges increase as healing process progresses)
- Prolonged passive stretch introduced in late sub acute
- Strengthening exercises begin in early sub acute with isometric contractions, late sub acute isotonic exercises are introduced
- Strengthening antagonist muscles will help prevent contractures from developing in agonist muscles