CONTUSIONS

p.265 in Rattray

Definition: A **Contusion** is a crush injury to a muscle causing damage to the muscle fibers and bleeding into subcutaneous tissue.

Hematoma: a large area of local hemorrhage following trauma. The pooling of blood causes swelling and pain as it compresses nearby nerve endings. Swelling is more rapid than with edema

Myositis ossificans: an occasional complication following hematoma, where the blood within the muscle calcifies. It is not known why some contusions result in calcification (pg 265)

List 3 possible causes of a contusion

1. contact sports – collision with another athlete or piece of equipment
2. motor vehicle accident – seatbelt injury to shoulder or abdomen
3. fall – falling a short distance or falling onto something

Levels of severity of Contusions

Mild Contusion

- minor crush to a muscle with minimal bleeding
- minimal or no loss of strength and minimal loss of range
- person can continue activity with mild to no discomfort

Moderate Contusion

- moderate crushing of muscle with bleeding and swelling
- person has difficulty continuing activity due to pain and muscle weakness

Severe Contusion

- severe crushing of the tissue with rapid bleeding and swelling
- person can not continue activity due to significant pain and muscle weakness

List the Signs and Symptoms for each stage of healing

ACUTE

MILD	MODERATE	SEVERE
*Minimal local edema *Tenderness at lesion site *Minor discomfort local to injury site with activity that contracts or stretches the muscle *5-20% loss of ROM and minimal to no loss of strength	*moderate local swelling due to hematoma *heat and bruising is present *moderate tenderness at lesion site *20-50% loss of ROM and moderate loss of strength	*marked rapid local swelling due to hematoma *edema heat and bruising *severe pain at lesion site *50 or more % loss of ROM and functional loss of strength *extreme pain at lesion site *can not continue activity

Client can usually continue activity	*noticeable pain with activity and has difficulty continuing	*protective muscle spasm may develop

- With all contusion the bruising is red, black and blue
- The swelling of a hematoma occurs faster than the swelling of edema

EARLY SUB-ACUTE

MILD	MODERATE	SEVERE
*little or no pain *no reduced strength	*pain with moderate decrease in strength *hematoma is still present but reduced from acute stage *pain, edema and inflammation are still present but decreased from acute stage	*pain and noticeable decrease in strength *hematoma is still present but reduced from acute stage *pain, edema and inflammation are still present but decreased from acute stage *protective muscle spasm decreases

- Bruising is black and blue
- Adhesions develop around the injury site
- Trigger points could develop in affected muscle

LATE SUB-ACUTE

- Bruising is yellow, brown and green
- Pain, edema and heat are diminishing
- Adhesions are maturing around the injury site
- Protective muscle spasm is replaced with increased tone of the affected muscle
- Trigger points can occur in the affected muscle and compensating muscles
- Hematoma diminishes
- ROM and strength are reduced

CHRONIC

- Bruising is gone
- Adhesions have matured around injury site
- Hypertonicity and trigger points are present in affected and compensating muscles
- Discomfort local to lesion site only if muscle is stretched
- Could be presence of myositis ossificans (calcification of hematoma)

Specific History Questions you would ask This Client

1. When did it happen?
2. How did it happen?
3. What were you doing at the time of the incident?
4. Was there first aid applied at the time of the injury?

Observation

ACUTE	EARLY/LATE SUB-ACUTE	CHRONIC
*antalgic gait if contusion is on lower limb *affected muscle could be wrapped with protective bandage *antalgic posture could be present (protecting the affected area) *edema *visual bruise (red black blue) *some redness local to injury	** same as acute *bruising changes to brown, yellow and green in early sub-acute and late sub-acute it starts to disappear	*with severe contusion the affected muscle could be supported during activity, there may be alteration in contour of muscle, indentation due to adhesions

Palpation

ACUTE	SUB-ACUTE	CHRONIC
*heat over injured muscle and possible the surrounding tissue *Tenderness is present local to injury site and refers to nearby tissue *texture of edema is firm *protective muscle spasm is present in affected muscle (synergist and antagonist)	*decrease in temperature over the injury site *tenderness is still present locally *Texture of edema is less firm *swelling of hematoma decreases *change in muscle tone from spasm to hypertonic *trigger points could be present	*cool to touch due to ischemia *point tenderness local to lesion site *Adhesion and fascial restrictions at lesion site Hypertonic muscle and trigger points in affected and compensating muscles

Testing

ACUTE

AF ROM

- ROM of the joints crossed by the affected muscle are reduced
- Mild contusion ROM is reduced up to20 %
- Moderate contusion ROM is decreased up to 50%

- Severe contusion Rom is reduced more than 50%

If a moderate or severe contusion is suspected other testing is contraindicated in the acute stage.

PR ROM

- In a mild contusion is only performed in the cardinal planes of motion with the range that stretches the affected muscle done last
- A painful muscle spasm end feel is present before the muscle reaches full range

AR ISOMETRIC TESTING

- The affected muscle with a mild contusion reveals minor to no loss of strength and some discomfort

SPECIAL TESTING

- With moderate or severe contusion, a girth measurement test is positive with a hematoma and the client should be referred for medical attention

SUB-ACUTE

AF ROM

- Joints crossed by the affected muscle is reduced
- Range is limited due to pain but less than in acute stage
- Degree of limitation increases with severity of injury

PR ROM

- Performed on the cardinal planes of motion with the range that stretches the affected muscle performed last
- Painful, tissue stretch end feel is present before end range
- Pain could be present with tissue approximation

AR ISOMETRIC TESTING

- Affected muscle will reveal pain at injury site
- Contraction of muscle is held till the onset of pain only
- Severity of contusion is graded taking loss of strength into consideration

CHRONIC

AF ROM

- Joints crossed by the affected muscle may be limited by any remaining pain at the ends of range

PR ROM

- May reveal mildly painful, tissue stretch end fell on fully stretching the affected muscle

AR TESTING

- Affected muscle may reveal decreased muscle strength, especially with severe contusion

SPECIAL TESTING

- Length Tests for rectus femoris, gastrocs, soleus, adductors or hamstrings with a moderate or severe contusion reveal shortness of these muscle

Contraindications

1. Testing, other than pain free active free ROM
2. Onsite work in the acute stage
3. Avoid removing protective muscle spasms in acute stage
4. Distal circulation techniques

Treatment Goal in Each Stage of Healing

ACUTE

- Reduce inflammation
    - Treat the muscle with R.I.C.E. (rest ice compression elevation)
    - Positioning depends on location of injury
    - Cold hydrotherapy is applied to injury site
- Reduce pain and decrease SNS firing
    - Accustom the client to your touch
    - Encourage diaphragmatic breathing
    - Start generally and then work more specific
- Treat an compensating structures
    - Treat unaffected side and other compensating areas with effleurage and slow petrissage
- Reduce edema
    - Lymphatic drainage techniques to the affected area
    - Unidirectional effleurage proximal to injury site
    - Stroking proximal to injury site
- Maintain local circulation proximal to injury site only
    - If contusion is on a limb, proximal limb is treated to reduce pain and hypertonicity as well as increase drainage and venous return
    - Effleurage and repetitive petrissage
- Reduce but do not remove protective spasm
    - Do not over treat the protecting tissues
    - Careful muscle squeezing and light stroking are used distally
- Maintain ROM
    - Passive relaxed ROM of proximal/distal joints to the onset of pain only is used with mild contusion
- Treat other conditions
    - Any other injuries such as sprains and strains are also treated

SUB-ACUTE

- Reduce inflammation
    - Hydrotherapy is cold/cool
    - Elevate the affected area
- Reduce pain and decrease SNS firing
    - Encourage diaphragmatic breathing
    - Start generally and then work more specific
    - Get a feel of clients pain tolerance and pain perception

- Treat any compensating structures
    - Treat any compensating structures appropriately
- Reduce edema
    - Lymphatic drainage techniques
    - Nodal pumping, unidirectional effleurage, stationary circles
    - All is performed proximal to lesion site to prevent congestion in through the injury
- Prevent adhesion formation and maintain local circulation proximal to injury site only
    - Proximal limb is treated to reduce hypertonicity with effleurage, petrissage and O&I technique
- Reduce spasm
    - GTO release to affected muscle proximal tendon
    - Agonist contract could also be used
- Reduce trigger points and hypertonicity without disturbing injury site
    - Treat TP's in proximal muscles that refer to the injury site
    - Do not treat TP's in the affected muscle belly unless they are well proximal to the injury site
    - Onsite work is indicated with a mild contusion only
- Maintain ROM
    - Passive ROM with mild contusion, helps promote lymphatic drainage when done in successive action
    - Distal techniques include stroking and muscle squeezing only

CHRONIC

- Increase local circulation
    - Distal limb is treated with effleurage and petrissage to increase venous flow
- Reduce SNS firing and treat compensating structures
    - Client's trunk and unaffected areas are treated first
    - Rhythmic techniques are indicated
- Reduce hypertonicity and trigger points
    - Proximal limb is treated with effleurage, petrissage and ischemic compression
- Reduce adhesions
    - Specific kneading and muscle stripping to affected area
    - Cross fiber frictions are performed to any remaining adhesions
    - Joint play techniques to proximal and distal joints
- Restore ROM
    - Passive ROM to full range is used on proximal and distal joints

Homecare

1. hydrotherapy that is appropriate for the stage of healing
2. maintain ROM
3. remedial exercise appropriate for stage of healing