HIP, PELVIS, AND THIGH INJURIES

Sports Medicine II
Objectives

• Describe basic hip anatomy
• Explain common hip, pelvis, and thigh injuries that occur in athletics
• Identify common signs & symptoms of hip, pelvis, and thigh injuries
• Explain treatments performed by an ATC for specific hip, pelvis, and thigh injuries
Anatomy of the Hip, Pelvis, and Thigh

- The hip, pelvis, and thigh contain some of the strongest muscles in the body; but the area is also subjected to tremendous demands.
- Thus, they are vulnerable to injuries that can sideline a player for long periods of time.
- The hip joint is a synovial ball-and-socket joint.
- It is formed by the articulation of the femur and the pelvis.
Anatomy of the Hip, Pelvis, and Thigh

• The hip is comprised of the following bones:
  – Femur
  – Pelvis

• The **acetabulum** – cup shaped structure, that form the hip socket, is very deep and covered by thick ligamentous structures, that provide stability.
Anatomy of the Hip, Pelvis, and Thigh

- Two of the muscle groups of the femur are the quadriceps and the hamstrings.
- The hip muscles include the most powerful muscles in the body.
- The hip flexor group flexes the thigh, and the hamstrings and gluteus maximus extend the thigh.
- Abduction is predominantly performed by the lateral muscles, which include the gluteus medius & minimus and the tensor fascia latae.
- Adduction is performed by the groin muscles.
What would you do...

- You are a new athletic trainer at a high school and the head football coach tells you that last year his team had too many injuries in the quad, hip, and groin region. What are you going to do to help eliminate this problem for the upcoming season?
Preventing Hip Injuries

• Because the hip is a very stable joint, we will tend to see very few sprains, but many hip strains and contusions.

• Therefore, proper flexibility training and stretching prior to vigorous exercise or activity is warranted.

• Because the thigh is exposed to contact in many athletic activities it is important to have the proper equipment.

• Also the iliac crest (the point of the hip), must be protected because it has very little natural protection.

• Proper strength training is also very important for these muscles to maintain normal balance and stability.
Ligament Injuries

- The hip is a ball-and-socket joint that is extremely stable—mostly because the head of the femur sits so deeply in the pelvis. Very thick ligamentous structures and strong muscles also surround the hip making sprains highly unlikely.
Muscle and Tendon Injuries

• Common muscle strains to the hip & thigh:
  – Quadricep Strains
  – Hamstring Strains
  – Groin Strains
  – Hip Flexor Strains
Quadriceps Strain

• Most quad strains occur due to a sudden stretch (for example, falling on a bent knee) or a sudden contraction (for example, jumping in volleyball or kicking in soccer).

• Signs & Symptoms generally include:
  – Pain on knee flexion
  – Point Tenderness
  – May or may not have swelling (edema)
  – Muscle tightness over the quadriceps
Quadriceps Strain Treatment

• Quad strains should initially be treated with PRICE and wrapped with a supportive elastic bandage.

• After 48-72 hours gradually begin using moist heat and gentle stretching.

• Rehabilitation will focus on regaining strength and range of motion and enhancing flexibility.
Hamstring Strains

- Hamstring strains rank second in incidence or sports injuries to the thigh (#1 quad contusions).
- The exact cause of hamstring strain is not known.
- Some possible reasons for strain include:
  - Muscle fatigue
  - Sciatic nerve irritation
  - Improper form
  - Imbalance of strength between hamstring muscle groups
- Signs & symptoms will vary depending on severity:
  - Muscle soreness
  - Point tenderness
  - Sometimes they hear a “snap” or “pop”
  - Pain
  - Stiffness
  - Loss of knee flexion
  - Discoloration (severe strain)
Hamstring Strain Treatment

• Initially PRICE
• Reduce activity until soreness is gone.
• After inflammation is gone, begin strengthening and flexibility.
Groin & Hip Flexor Strains

- The groin is the depression between the thigh and the abdomen.
- Over extension of the groin or hip flexor musculature can result in a strain.
- Running, jumping, and twisting with external rotation can produce such injuries.
- These two strains can be two of the most difficult injuries to care for in sports.
- Signs & symptoms may include:
  - A sudden twinge or feeling of tearing during a movement
  - It may not be noticed until after termination of activity
  - Pain
  - Weakness
Groin & Hip Flexor Treatment

- The strain should be treated with intermittent ice, pressure, and rest for 48 to 72 hours.
- Rest has been found to be the best treatment.
- Exercise after pain free.
- Gradual stretching and restoring of normal ROM
- A protective spica should be used until full strength and flexibility are restored.
BONE INJURIES OF THE HIP & THIGH
Bone Injuries

- Although pelvic fractures are not common, they can occur when excessive stress is place on the bone tissue
- Athletic related fractures of the hip, pelvis, and femur are usually a result of
  1. *avulsion* (the tendon pulling away the bone)
  2. disruption of the *epiphysis* (damage to the growth plate)
  3. stress (stress fractures)
  4. trauma to the femur
Avulsions

- Avulsion fractures occur as a result of forceful muscle contractions that literally pull the bone away at the site where the tendon attaches.
- Example, when a football player continues to run aggressively forward while a defender is holding his leg.
Growth Plate Fractures (Epiphysis Fractures)

- Epiphyseal fractures occur at the growth plates, especially the capital femoral epiphysis, which is where the neck of the femur joins the head of the femur.
Stress Fractures

• Although uncommon, femoral stress fractures do occur in running-oriented athletes.

• Mechanism is generally a result of repetitive stress due to the pounding of the lower extremity while running.
Stress Fx Treatment

• Athlete will generally complain of pain and discomfort.
• Treatment will involve referral to a physician. (Note: stress fracture may not show on an x-ray for 2-3 weeks)
• Rest and an alternate activity such as swimming (aquatic therapy).
• The rest period is generally 4-6 weeks.
Femur Fractures

- The femur is the largest bone in the body and requires a tremendous force to fracture it.

- Femur fracture signs & symptoms include:
  - Severe pain
  - Loss of function
  - Internal bleeding
  - Swelling
  - Tearing of muscle, tendons, arteries, and nerves
  - *Often causes the leg to externally rotate*

- Femur fractures can be potentially life threatening due to the amount of internal bleeding.
Externally Rotated Leg

This is usually a good indicator of a hip/upper leg problem.
Femur Fx Treatment

• Call 911 (medical emergency due to the fact that a lot of blood can be lost)
• Immobilize
• EMS usually will use a traction splint that gently pulls the femur, which helps reduce leg pain
Hip Dislocations

- Hip dislocations are caused by extreme stress on the hip joint.
- Most hip dislocations occur posteriorly and usually involve other trauma such as a fracture.
- Signs & Symptoms will include:
  - Extreme pain
  - *Leg internally rotated*
  - Loss of ROM and function
Hip Dislocation Treatment

- Call 911
- Physician will x-ray and reduce the dislocation.
- Significant follow-up treatment is required before the athlete can return to competition.
- Athlete must begin with ROM and strength training. Progressing to gait training and relearning how to walk normally. This is quite a lengthy process.
Other Common Hip & Thigh Injuries

• Some other common injuries to the hip and thigh that we will discuss are:
  • Hip and Thigh muscle contusions
  • Legg-Calve-Perthes Disease
  • Bursitis of the trochanter
  • Snapping hip phenomenon
  • Hip pointer (contusion)
Hip & Thigh Contusions

• “Hip Pointer” – iliac crest contusion, occurs most often in contact sports.

• Results from a blow to the inadequately protected iliac crest.

• The hip pointer is one of the most handicapping injuries in sports and is difficult to manage.
Signs & Symptoms of a Hip Pointer

- Immediate pain
- Muscle spasm
- Unable to rotate the trunk
- Unable to flex the thigh
Hip Pointer Treatment

- Ice and pressure for at least 48 hours
- If severe bed rest for 1-2 days will help speed recovery.
- Referral to physician to rule out a fracture
- Ice massage
- Anti-inflammatory
Legg-Perthes Disease

- Legg-Perthes disease is an avascular necrosis of the femoral head.
- It occurs in children ages 3-12 and in boys more often than girls.
- The reason for this condition is not clearly understood.
- Circulation becomes disrupted at the head of the femur, causing the articular cartilage to become necrotic and flattened.
Legg-Perthes con’t.

• Signs & Symptoms
  – Complain of pain in the groin that is sometimes referred to the abdomen or knee
  – Limping is typical

• Treatment
  – Bed rest
  – Special brace to avoid direct weight bearing

• If treated early enough the head of the femur will revascularize and regain its original shape
Bursitis of the Trochanter

- *Trochanteric bursitis* is a relatively common condition of the greater trochanter of the femur.
- Most common among women runners
- Treatment includes:
  - Elimination of running on inclined surfaces
  - Correction of any leg length discrepancies
  - Correct poor running form
  - Ice bags or Ice massage
  - Gentle stretching
  - Rest and anti-inflammatory
“Snapping Hip”

- This injury is common among dancers, gymnasts, and hurdlers.
- It commonly occurs when the athlete laterally rotates and flexes the hip joint repeatedly, causing the hip joint and associated soft tissues to become unstable.
- The athlete will complain of a snapping, mainly when balancing on one leg.
- Treatment includes:
  - Avoiding the action that causes the snapping
  - Stretching tight musculature
  - Strengthening weak musculature
  - Refer to physician if there is pain
Thigh/“Quad” Contusions

• The quadriceps are continually exposed to traumatic blows in a variety of sports.
• They usually develop as the result of a severe impact on the relaxed thigh, compressing the muscle against the hard surface of the femur.
• Early detection and avoidance of profuse internal hemorrhage are vital, both in effecting a fast recovery by the athlete and in the prevention of widespread scarring.
Quad Contusions

• Signs & symptoms (in general)
  – Pain
  – Temporary loss of function
  – Immediate capillary effusion
• Quad contusions can be graded according to their severity.
  – First degree contusion
  – Second degree contusion
  – Third degree contusion
Quad Contusions Con’t

• First Degree Contusions
  – Creates a mild hemorrhage
  – Little pain
  – No swelling
  – Mild point tenderness
  – No restriction of ROM
Quad Contusions Con’t.

- **Second-Degree Contusion**
  - Pain
  - Swelling
  - ROM knee flexion is less than 90 degrees
  - Obvious limp
Quad Contusions Con’t.

• Third-Degree Contusion
  – A major disability
  – May cause the fascia to rip allowing the muscle to protrude (muscle herniation).
  – Pain is severe
  – Swelling
  – Movement of the knee is severely restricted
  – Obvious Limp
Quad Contusion Care

• Cold and Compression can help control superficial hemorrhage
• Should be handled conservatively
  – RICE
  – Gentle static stretching
  – Crutches when limping is present
  – Heat after the acute phase has passed (48-72 hours)
  – Ace Wrap to give pressure and provide support
Quad Contusion Care Con’t

• A severe blow or repeated blows to the thigh, usually the quadriceps muscle, can produce **ectopic bone formation** known as **myositis ossification**.

• Improper care of a thigh contusion can lead to myositis ossificans. Improper care may be:
  • Attempting to run off a quad contusion
  • Too vigorous treatment of a contusion – for example, massage directly over the contusion, ultrasound therapy, or superficial heat to the thigh.
Myositis Ossificans X-Ray

FIGURE 1. A plain radiograph of a 21-year-old woman who sustained a thigh injury during a soccer game reveals myositis ossificans (arrow) that resulted from a quadriceps contusion.
The End!

Questions????