

## Chapter 10: INJURIES TO THE THORACIC THROUGH COCCYGEAL SPINE

### Anatomy Review of the Thoracic Spine.

\_\_\_\_\_ (Slide 2). Both cervical and lumbar portions of the spine represent concave curves; the thoracic portion of the vertebral column is convex. The curves of the spine, ligaments, and intervertebral disks are important to the overall strength of the spinal column.

- A. \_\_\_\_\_ (Slide 2) that protects the internal organs of the region. The vertebrae of the thoracic spine are less mobile than both the lumbar and cervical spines.

I. Common Sports Injuries. Sports-related injuries to the thoracic vertebrae are uncommon, but those that occur are usually found in skeletal or soft tissue. Bone-related injuries are more common than soft-tissue injuries.

#### A. Skeletal Injuries.

\_\_\_\_\_ (Slide 3). Such injuries occur near the junction of the thoracic and lumbar spines and are usually related to violent, ballistic movements that occur in sports involving high velocities.

1. \_\_\_\_\_ (Slide 3).

2. Scheurmann's disease is sometimes seen in adolescents and is characterized by kyphosis. Children involved in activities that subject the spine to severe bending such as gymnastics may develop this condition.

a. Children who complain of recurrent pain in the thoracic region that is associated with these activities should be evaluated for Scheurmann's disease as described on page 143.

b. **Scoliosis** and **lordosis** may also be present. Children with these disorders need to be referred to a doctor for extensive evaluation.

3. Vertebral Fractures. Fractures to the thoracic vertebrae are extremely rare, but can result from a direct blow to the posterior thorax or extreme flexion of the thoracic spine, resulting in a compression of the vertebral body.

a. Signs and symptoms include pain in the area of the injury, extreme pain when moving the trunk of the body, swelling or discoloration in the area of the injury, and muscle spasm over the injured area.

b. First aid care involves immediate RICE application and removing the athlete from participation for 24 hours, with a follow-up evaluation.

1) If symptoms persist, refer athlete to a physician.

2) If neurologic symptoms are present during initial evaluation, refer to a physician immediately.

#### 4. Rib Fractures.

\_\_\_\_\_ (Slide 4). Fractures may occur anywhere along the rib, however, most occur near the angle of the rib, which is the weakest point.

- a. \_\_\_\_\_ (Slide 4)

Complications like these are serious because they can affect breathing and induce shock.

b. Signs and symptoms of rib fracture include \_\_\_\_\_ (Slide 5), and in severe cases, lung damage may result in pneumothorax (see Figure 10-3 on page 148).

- c. First aid involves: \_\_\_\_\_

\_\_\_\_\_ (Slide 6).

#### B. Sprains.

\_\_\_\_\_ (Slide 7). The thoracic spine is well supported, and its limited movement reduces the incidence of sprains.

1. Evaluation of a thoracic spinal sprain is difficult and must be based on a detailed history of the injury. The injured athlete typically reports having sustained an unusual movement of the thoracic spine that is associated with localized pain, a feeling of popping or snapping, and in some cases, swelling.

2. A consistent symptom of injury is painful respiration, which is associated with many different injuries.

a. First aid: \_\_\_\_\_ (Slide 7)

C. Strains. \_\_\_\_\_ (Slide 8).

Muscles of this region include the erector spinae (refer to Figure 10.9 on page 151) and the intercostal muscles.

1. Strains may occur during maximal exertions in sports that require a lot of force. Signs and symptoms may be difficult to differentiate from sprains. Often the injury mechanism is the same as a sprain.
2. Muscle spasms of the erector spinae may be noticeable and these muscles may be painful to touch.
3. First aid is the same as that prescribed for sprains, i.e., RICE.

D. Intervertebral Disk Injuries. Disk injuries to this portion of the spine are quite rare, but may be secondary to a compression fracture of the thoracic vertebrae.

1. Any athlete who complains of persistent neurologic symptoms, such as numbness or pain radiating around the thoracic region or into one or more of the extremities, should be referred immediately to a medical doctor for a more detailed evaluation.

**Anatomy Review** of the Lumbar Spine Distally to the Coccyx. The five vertebrae in the lumbar spine articulate superiorly with the thoracic vertebral column and inferiorly with the sacrum. \_\_\_\_\_ (Slide 9).

\_\_\_\_\_ (Slide 9). \_\_\_\_\_ (Slide 10). The sacroiliac joints are formed by the union of the sacrum and the pelvis (see Figure 10.5 on page 150).

I. Common Sports Injuries. Injuries to the lumbar spine are more common than to the thoracic spine. Spondylolysis is the most common injury to the bony portion of the lumbar spine.

A. Spondylolysis and Spondylolisthesis. \_\_\_\_\_ (Slide 11) (see Figure 10.6 on page 150).

1. \_\_\_\_\_ (Slide 11).
2. If both sides of the neural arch are affected, the vertebra has the potential to slip forward, producing a condition known as **spondylolisthesis**.
  - a. The most common location for spondylolisthesis is between L-5 and the sacrum.
3. The exact **etiology** of spondylolysis is unknown, however, evidence suggests that the bony defects may be congenital or develop during childhood.
4. Symptoms of spondylolysis \_\_\_\_\_ (Slide 12).

a. If spondylolysis progresses to spondylolisthesis, symptoms become more severe.

5. Athletes with such symptoms, especially those involved in high-risk sports for lumbar injury (gymnastics, tackle football, and weight lifting), should be referred to a medical doctor.

a. Treatment includes \_\_\_\_\_ (Slide 12).

B. Traumatic Fractures. \_\_\_\_\_ (Slide 13)

1. External blows to this region may also result in internal injuries, such as to the kidneys.
2. Radiating pain into the buttocks or legs may be present.
3. Treat with great care by immobilization on a spine board and transport to a medical facility. Signs of internal injury include deep abdominal pain, **hematuria**, or shock.
4. Injuries to the sacrum or coccyx generally result from direct blows, and are normally self-limited but require protection from future trauma.

a. A severe blow to the coccyx may result in fracture or severe bruise.

1) Signs and symptoms involve \_\_\_\_\_ (Slide 13)

b. \_\_\_\_\_ (Slide 13)

C. Sprains and Strains. \_\_\_\_\_ (Slide 14).

Sprains involve the contractile tissues of the region or the erector spinae muscles (refer to Figure 10.9 on page 151). Sprains involve the ligaments and joint capsules in the region.

1. The major joints of the region include \_\_\_\_\_ (Slide 14).
2. Generally, joint injuries in this region are rare, but muscle strains occur frequently, particularly in sports that place great stress on the lumbar spine, such as gymnastics, tackle football, and weight lifting.
3. Signs and symptoms include \_\_\_\_\_

\_\_\_\_\_ (Slide 15). The pain of a simple strain or sprain does *not* radiate into buttock or lower extremity.

4. First aid care includes removing the athlete from participation with assistance.
  - a. Place the athlete in a supine position with a rolled towel or similar soft support into the lumbar region as shown in Figure 10.10 on page 152.
  - b. Place a bag of crushed ice into the lumbar region.
  - c. Instruct athlete to sleep in this position and continue to apply ice for the next 24 hours.
  - d. If symptoms are not reduced significantly during the first 24 hours after the injury, medical referral is necessary.

5. If the athlete complains of pain radiating into one or both legs, referral to a physician is crucial because a herniated disk may be present.

#### D. Lumbar Disk Injuries. \_\_\_\_\_

\_\_\_\_\_ (Slide 16). Although a herniated disk can occur in any region of the spine, \_\_\_\_\_ (Slide 16).

1. These injuries usually occur when the athlete is subjected to a great deal of force when in an awkward position.
2. The typical disk has an outer ring (annulus fibrosis) and inner ring (nucleus pulposus). \_\_\_\_\_

\_\_\_\_\_ (Slide 17)

- a. \_\_\_\_\_ (Slide 17)
3. Signs and symptoms include intense local pain that is aggravated with efforts to sit up, walk, or stand.
  - a. The pain radiates into buttocks and lower extremity, following sciatic nerve distribution.
  - b. Sensory loss or burning/tingling radiating into lower extremity.
  - c. Pain greatly intensifies if athlete tries to do a straight-leg raise or a sit-up.
  - d. Muscle spasm and postural abnormalities.
  - e. In severe cases, the herniation may interfere with normal bladder and/or bowel function.

4. First aid care involves removing the athlete from participation with assistance.

- a. \_\_\_\_\_ (Slide 18).
- b. \_\_\_\_\_ (Slide 18)
- c. \_\_\_\_\_ (Slide 18)
- d. \_\_\_\_\_ (Slide 18)
- e. Although little can be done in the field for such injuries, a combination of physical and drug therapy can alleviate long-term symptoms.