

Napa Primary Care Conference 2025

Neck Problems in the Athlete

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Introduction

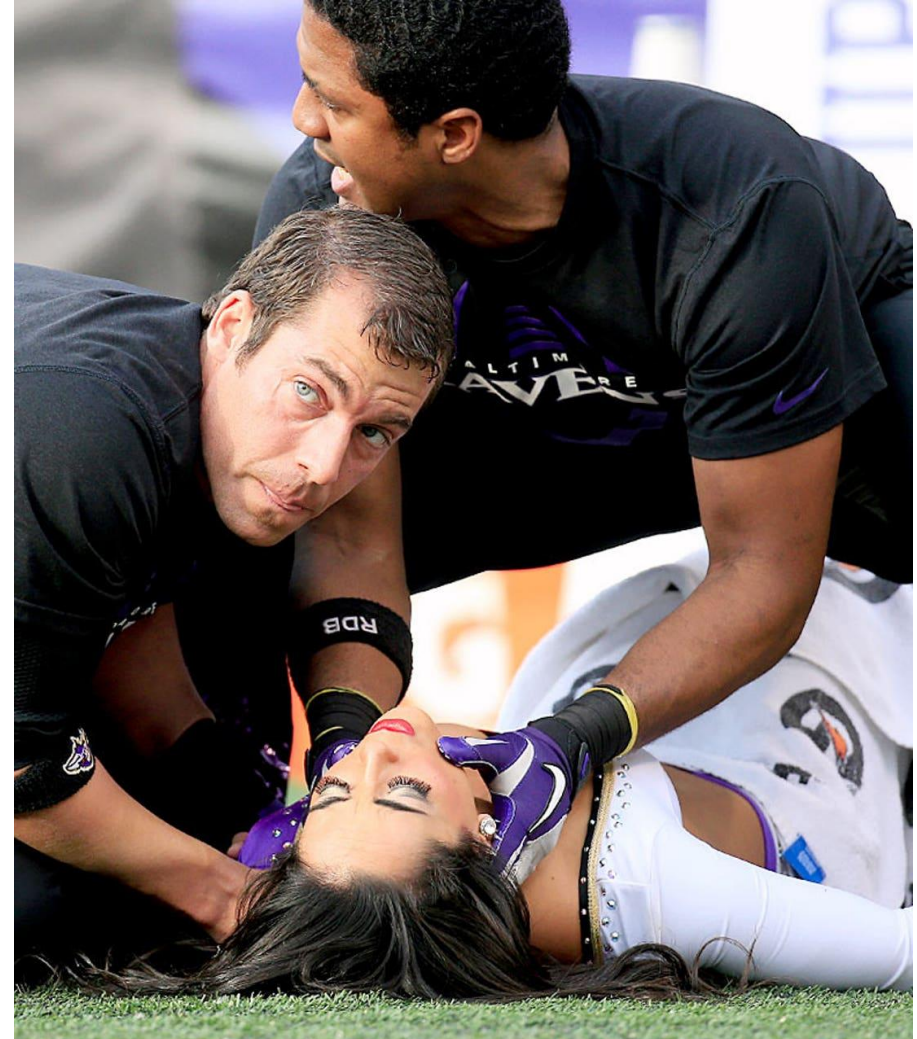
- Neck is vulnerable to sports related injury that can be catastrophic.
- Most common in contact sports (football, soccer) and sports with potential for high impact injury (gymnastics, diving, cycling).
- Sports medicine physicians must be ready to diagnose and manage sports related neck injury.



Al Lucas dies after neck injury in LA Avengers, Arena Football game in April of 2005

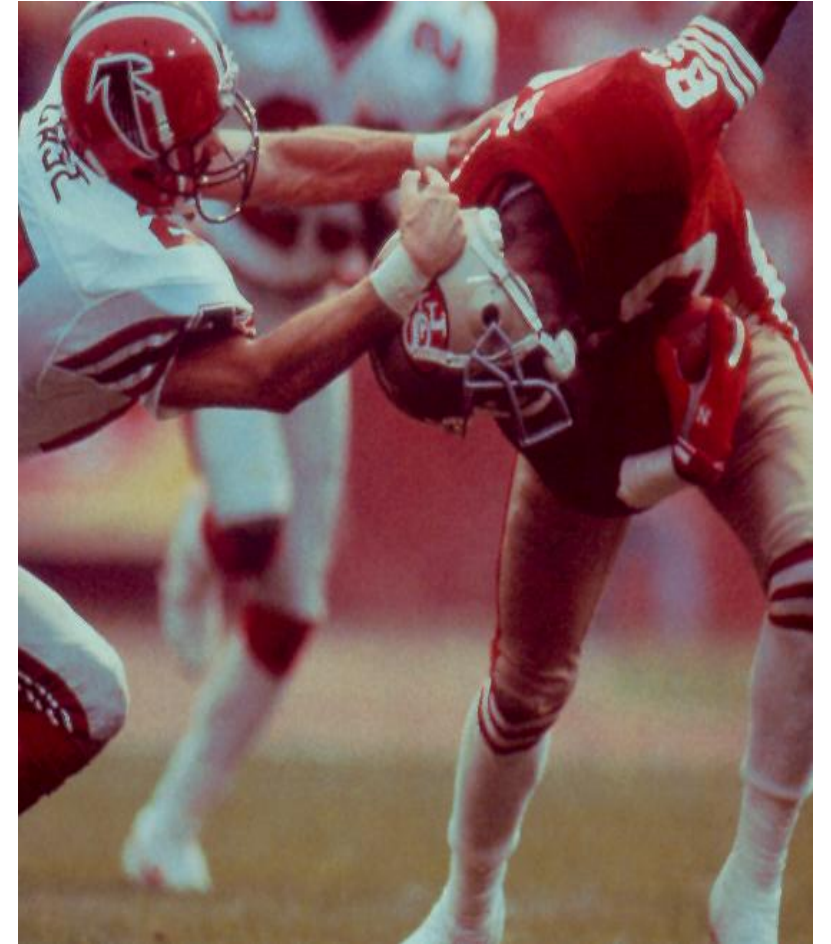
Overview

- Review common sports related neck injuries including:
 - Transient Brachial Plexopathy
 - Cervical Spine Injury
 - Transient Quadriplegia
 - Thoracic Outlet Syndrome
 - Brachial Plexitis
 - Backpacker's Palsy
- Focus diagnosis and management both on the sideline and in the office



Transient Brachial Plexopathy

- Also known as “burners”, “stingers”, “hot shots” or “pinched nerves”
- The most common sports related brachial plexus injury
- Especially common in football
- Also commonly seen in other contact sports like wrestling, rugby, hockey, Lacrosse, gymnastics/cheerleading



Incidence of Burners in College Football Players

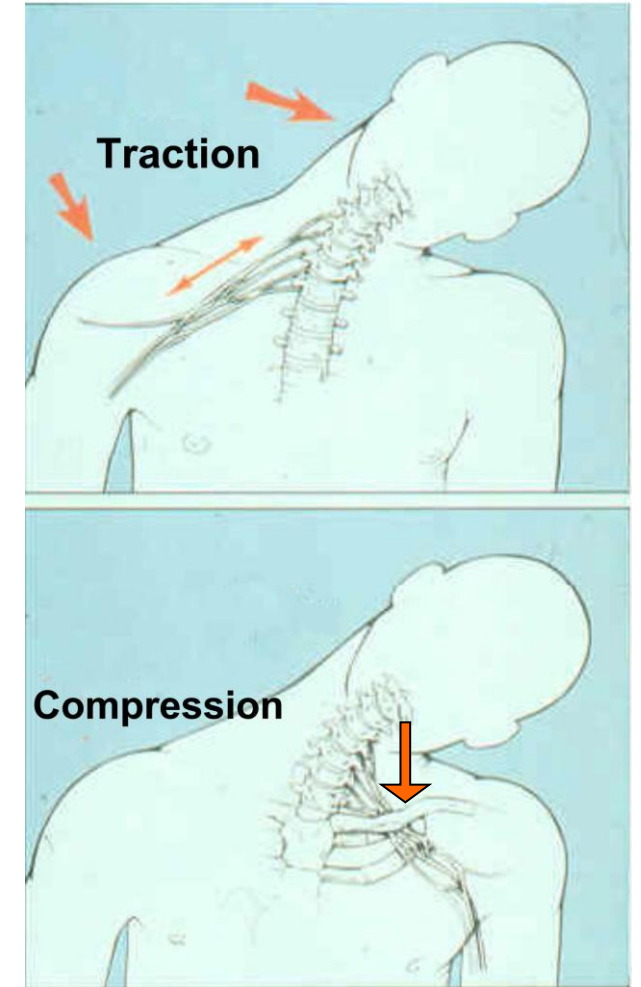
- 65% of college football players surveyed has previously suffered a burner during their football career
- 57% had them recurrently
- 52% had one in previous season
- Defensive backs most frequent
- Happen more often in games (55%) than practice
- Often go unreported



Sallis; Phys and Sportsmed; 1992

Mechanism of Injury

- 2 common mechanisms:
 - Lateral neck flexion with shoulder depression that stretches the brachial plexus
 - Lateral neck flexion causing compression of the brachial plexus
- Upper trunk (C5-C6 nerve roots) of brachial plexus is typically involved.



Burner Signs and Symptoms

- Sudden burning pain and numbness radiating down the lateral arm
- Unable to move arm normally and arm often dangling weakly at side
- Often shake arm to “wake it up”
- Arm weakness (deltoid, biceps, wrist flexors)
- *Decreased* DTR's
- Typically resolves within 1-2 minutes



Sideline Evaluation

- Rule out more serious injury (cervical spine, shoulder dislocation, AC separation)
- Check for **neck** tenderness and examine ROM
- Assess sensation (lateral arm, thumb, index finger)
- Assess strength (deltoid, biceps, wrist flexors)



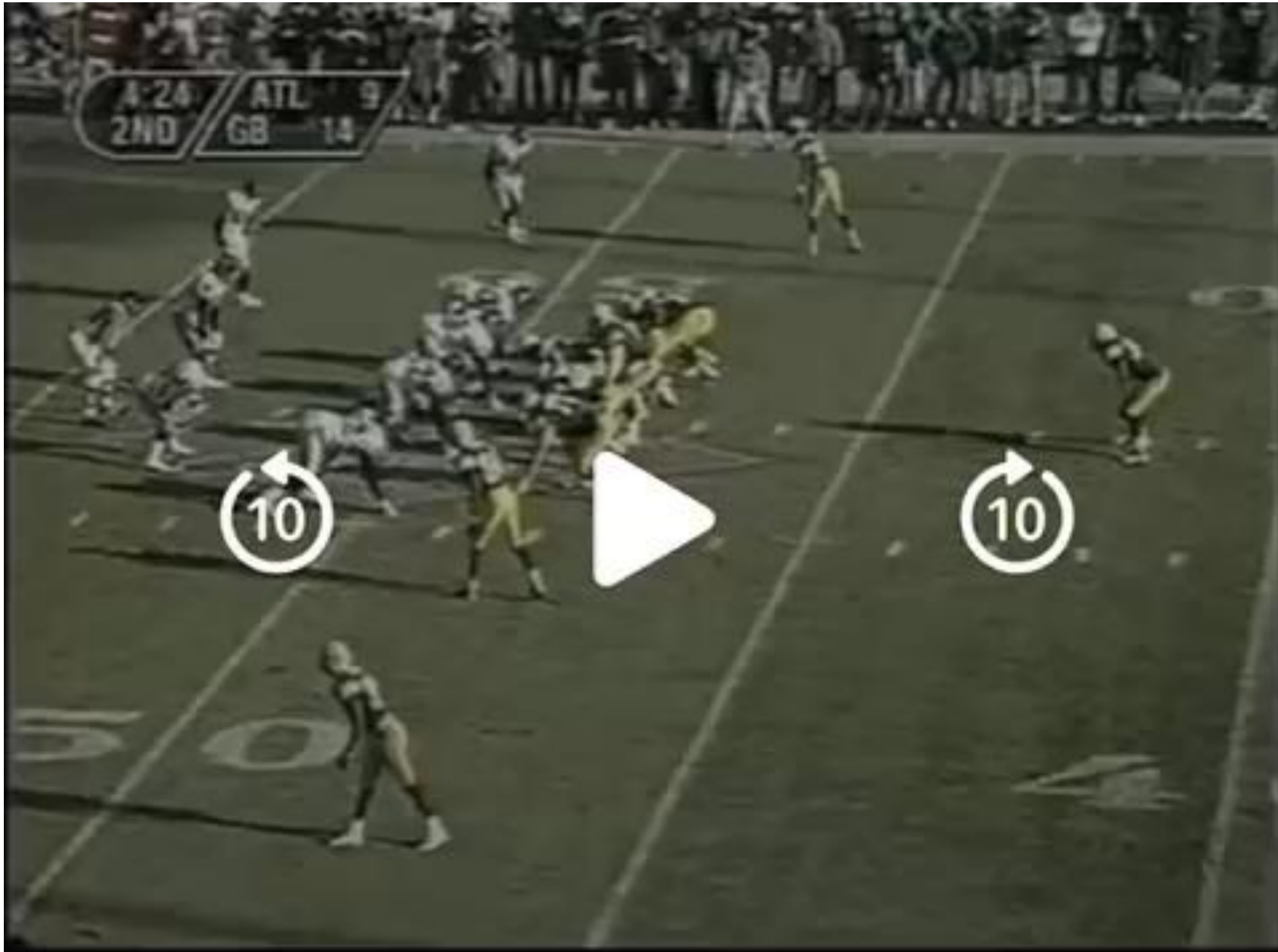
Return to Play

- No play if persistent pain, weakness or sensory changes
- May return if no symptoms and full neck range of motion
- Repeat exam after game and the following week to look for delayed weakness or muscle atrophy.
- Some weakness may persist up to a week



Sterling Sharpe
Green Bay Packers

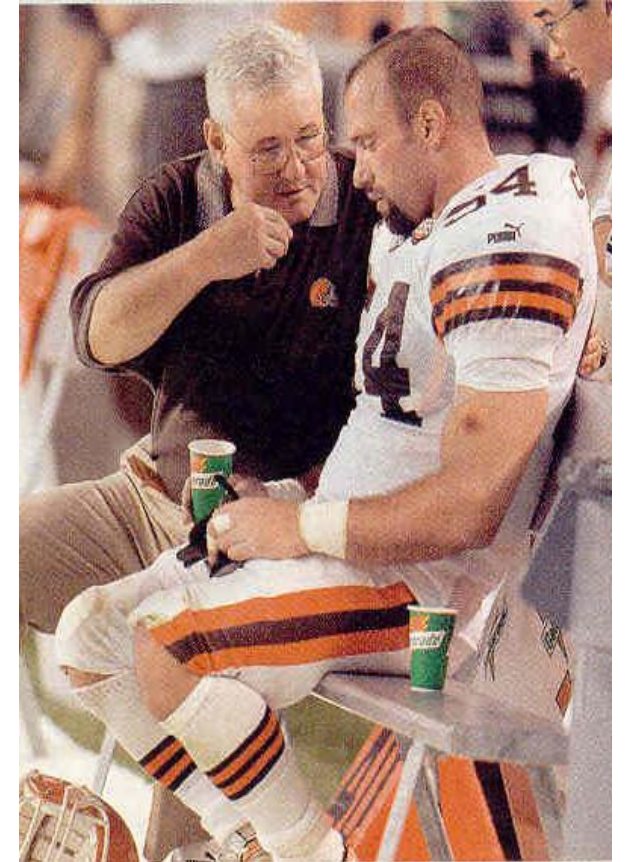
Stering Sharpe Final Injury



Diagnostic Evaluation

(For Players With Persistent or Recurring Symptoms)

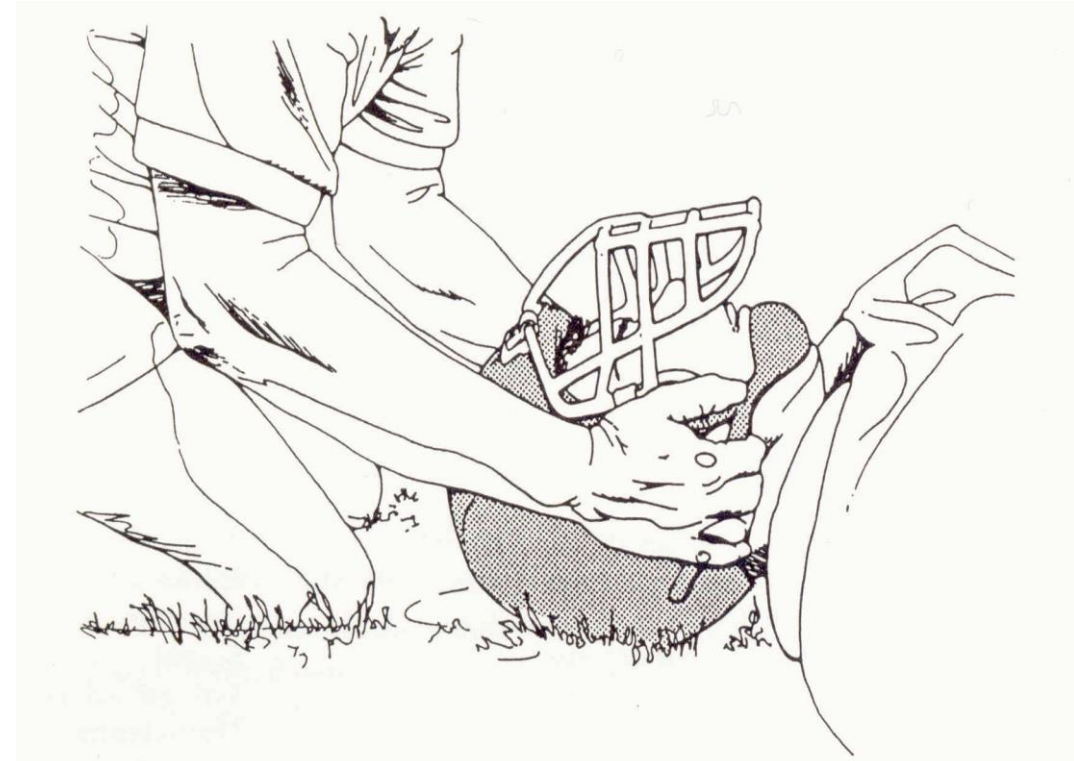
- **Cervical spine x-rays** (with flexion and extension views) – to look for instability
- **EMG** – can pinpoint location of nerve injury – nerve root vs plexus
- **MRI** – can show cervical disc herniation
- Disc injury can be treated with surgery or epidural; Plexus injury treated conservatively



Chris Spielman
Cleveland Browns

Sideline Management of the Unconscious Athlete

- Assume a cervical spine injury in any unconscious athlete
- Immobilize head and neck using in-line traction.
- Place the athlete on a spine board until a lateral neck x-ray can be obtained.



Hold In-line Traction to maintain head & neck in neutral position

Managing the Unconscious Athlete



Cervical Spine Injury

- Assume a C-spine fracture in any athlete with neck pain after trauma to head or neck
- Immobilize on spine board if any chance there is an unstable fracture
- Clear the cervical spine before moving any downed athlete with neck pain
- Must be awake and alert to clear the cervical spine



Darryl Stingly vs Jack Tatum 1978

Jack Tatum Vs Darryl Stingley



Clearing Cervical Spine On the Field

- Ask about:
 - Numbness or tingling to hands or feet?
 - Grip hands and fingers?
 - Can you move toes and ankles?
- Check for:
 - Tender along spinous processes?
 - Turn neck to sides, flex off ground any symptoms?
- Allow athlete to get up cautiously, remove equipment and repeat exam.
- Spine board for CT or x-ray if any question of fracture.



Placing Athlete on a Spine Board

- The **Log Roll technique** is the most common method used to place an athlete onto a spine board
 - Need 4 people to roll body and 1 to slide board under
 - Person holding head is in charge
 - *Only* method for prone patient that needs to be rolled to back



Log Roll Technique for Spine Board Placement



Placing Athlete on a Spine Board

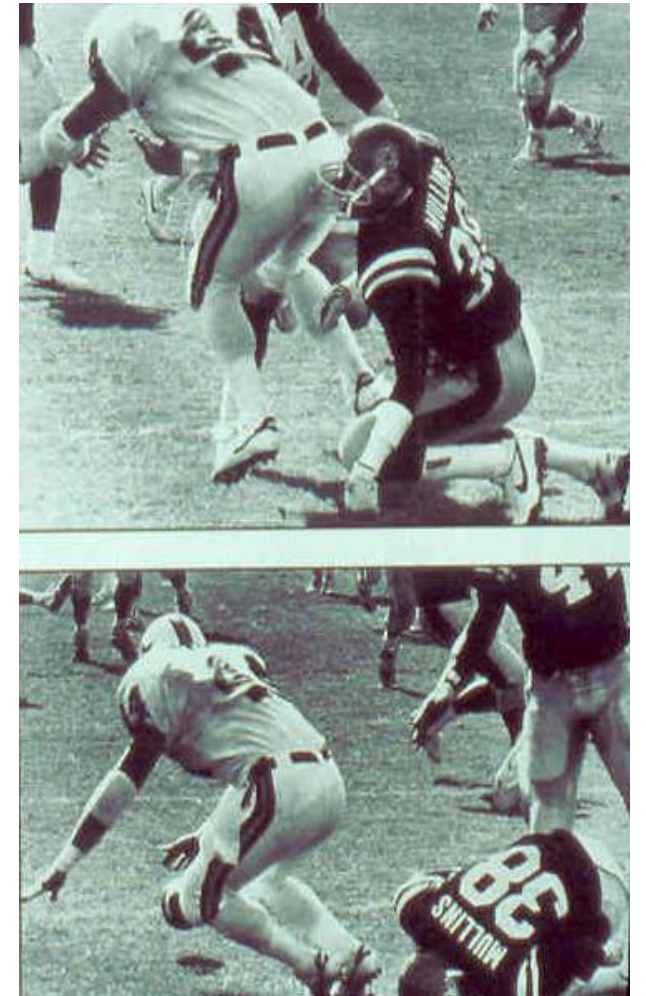
- **The 8-Person lift (Lift & Slide)** is an alternative technique shown to cause less neck motion
 - Need 3 on each side, 1 at head and 1 to slide spine board
 - Person holding head is in charge.
 - The patient is lifted straight up and board slid into place



Message for Football Players

Avoid Hitting With Your Head

- Improper blocking or tackling technique (spearing) can put players at risk for C-spine injury
- Using head as a battering ram can result in axial loading of the spinal column and cause a cervical blowout fracture
- Players need to “see what they hit” to help avoid catastrophic C-spine injury



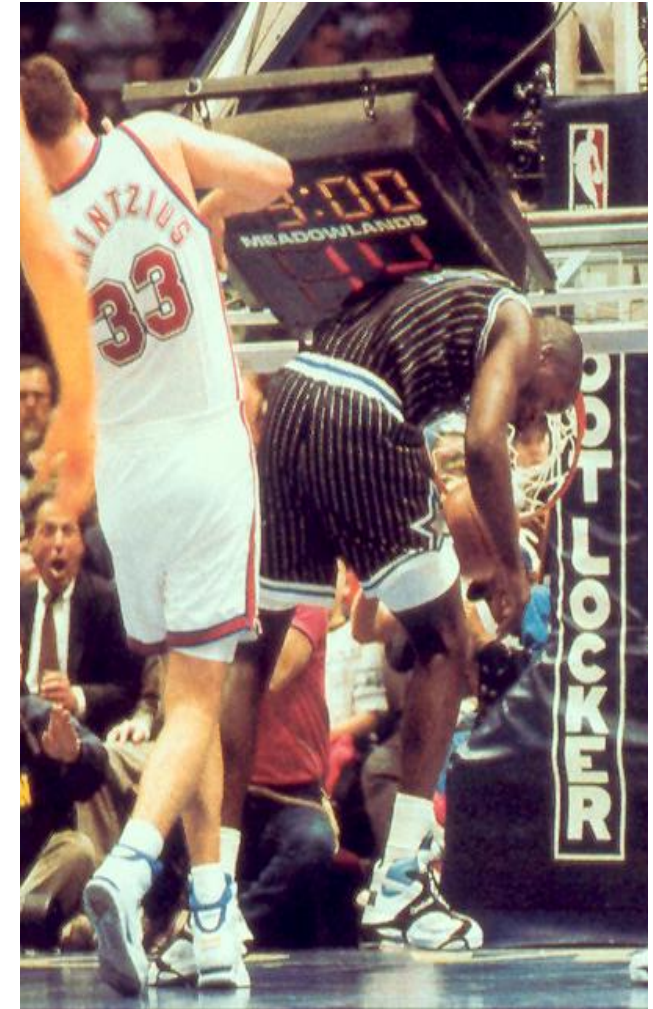
Chuckie Mullins - Ole Miss

Chuckie Mullins – 10/28/89



Transient Quadriplegia (Spinal Cord Concussion)

- Symptoms similar to a burner (numbness, tingling, burning) – but involving all 4 extremities
- Occurs after forced neck hyperflexion, hyperextension, or axial loading
- Symptoms usually resolve in 10-15 minutes or less (occasionally have residual up to 48 hrs)
- Often associated with cervical spinal stenosis



Transient Quadriplegia

- No evidence this predisposes an athlete to permanent neurologic injury.
- Study of 117 football players with complete permanent quadriplegia
 - None had prior episodes of TQ
 - No athletes who had TQ and resumed playing went on to permanent injury
 - *Torg JS, J Bone Joint Surg, 1986*



Curtis Williams
U. Washington

Transient Quadriplegia – Return to Play

- No great data to guide decision
- Discourage return if:
 - Previous episode
 - Symptoms lasting >36 hrs
 - Spinal instability on flex/ext x-ray
 - MRI shows cord defect or edema
- Caution if:
 - Narrow canal
 - Cord deformation or disc disease



Trevor Knight
Oklahoma QB

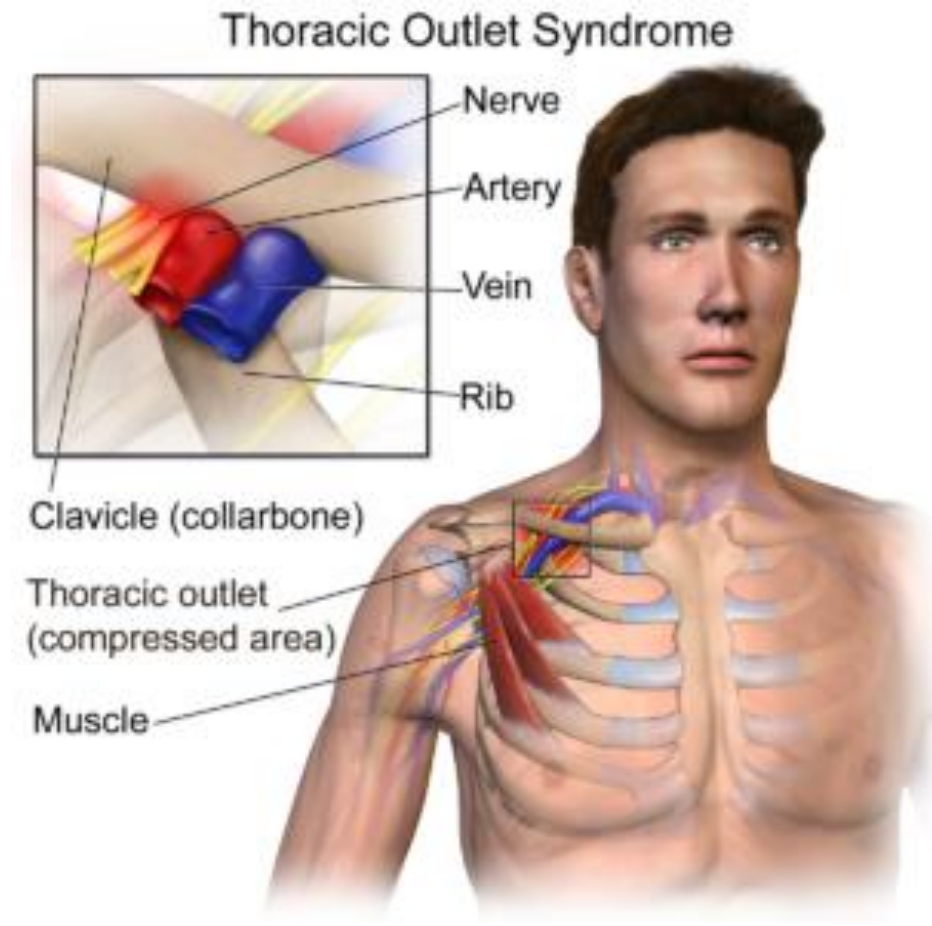
Spinal Stenosis

- MRI better than x-ray measurement (Pavlov ratio)
 - *Pavlov ratio* = width of spinal canal / width of vertebral body
 - Indicative of *stenosis* if $<.8$
 - High false positive in football players
- Return to play with spinal stenosis is on an individual basis
- No evidence they are at risk for permanent quadriplegia (although recurrent transient episodes more common)



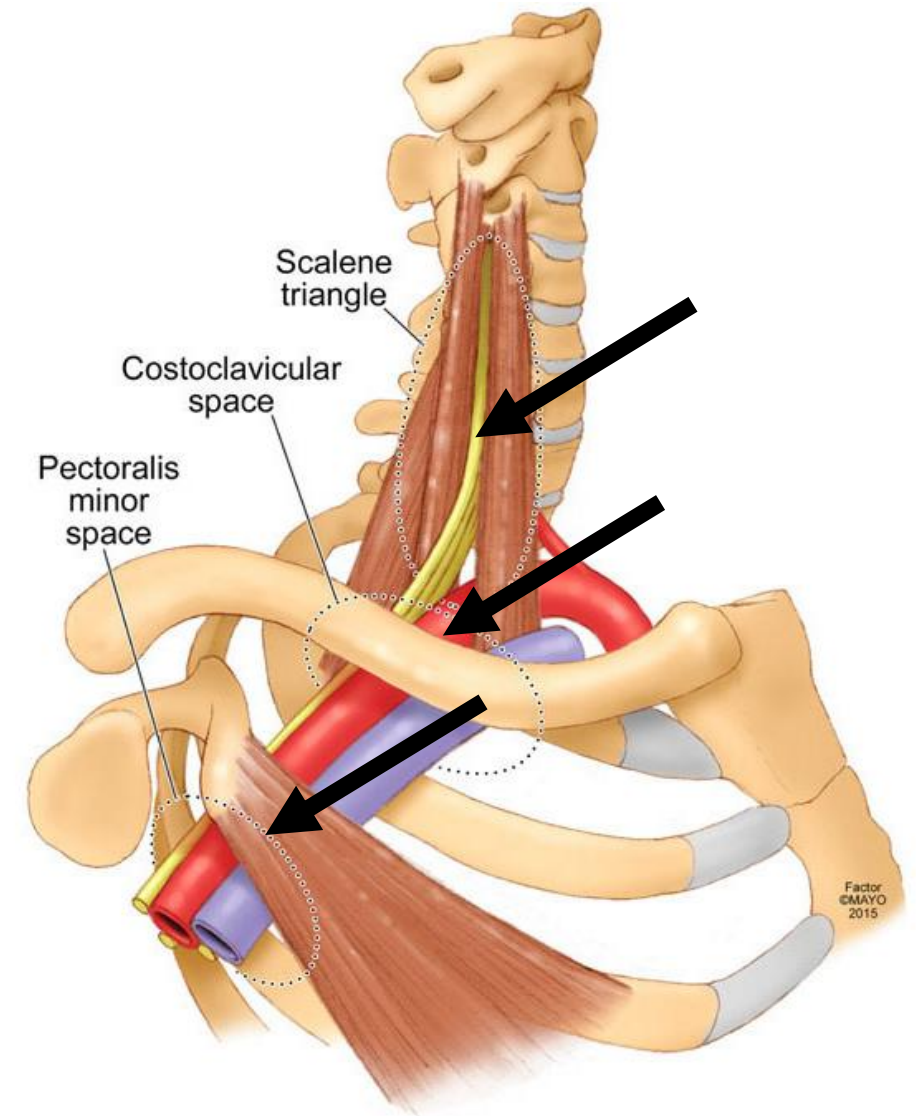
Thoracic Outlet Syndrome

- Caused by compression of the neuro-vascular structures in the thoracic outlet area (between clavicle and 1st rib)
- The nerve, artery and vein travel from neck to shoulder and upper extremity
- Compression may result from trauma, overuse or anatomic deformity



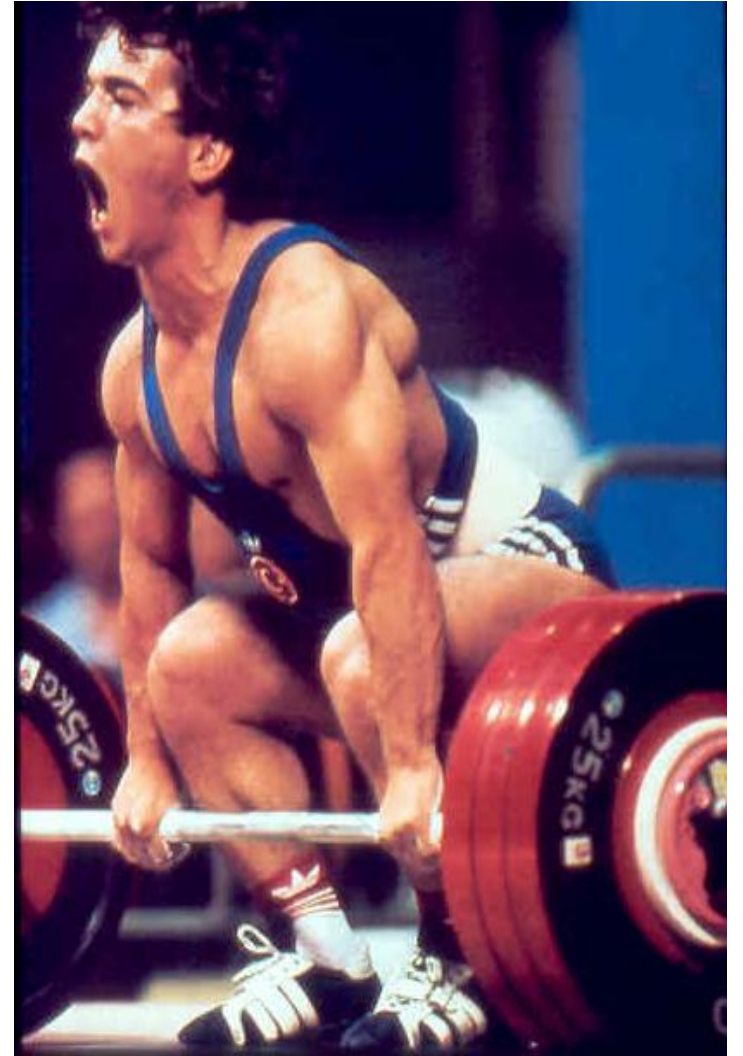
Common Sites for Compression

- *Between* the heads of the Scalene muscles.
- Under a Cervical rib.
- *Between* 1st rib and clavicle.
- *Under* Pectoralis minor and Coracoid.



Other Factors May Contribute

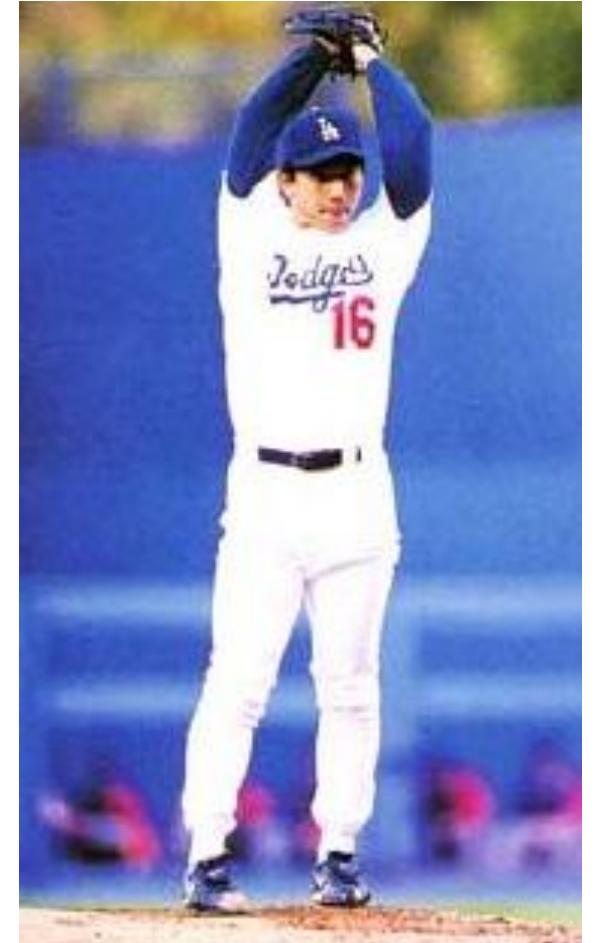
- Poor posture with sagging shoulders
- Callus formation after fracture of 1st rib or clavicle
- Weight training
- Exertion
- Local trauma



TOS Symptoms

Depend on Structure Compressed

- **Neurologic** – most common; causes pain, paresthesia, and sensory loss
- **Arterial** – causes claudication pain, numbness, and a cool and pale limb
- **Venous** - causes pain, edema and venous engorgement – may lead to clot



Physical Exam:

Positive test if symptoms reproduced or pulse diminished

- Roos Test
- Adson's Test
- Wright's Test
- Costoclavicular Test



Other Diagnostic Tests

- Chest and rib X-rays to look for
 - Cervical rib
 - Hypertrophic callus after fracture
 - Apical lung lesion (Pancoast tumor)
- Nerve conduction study
- Arteriogram
- Venogram



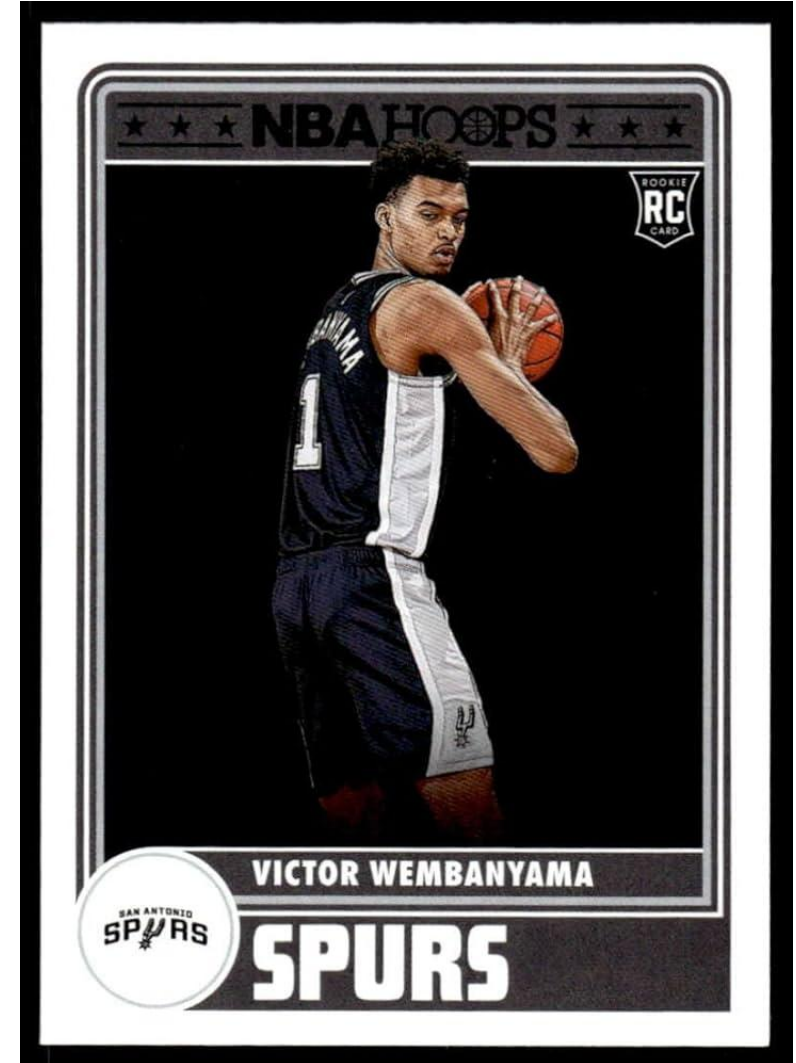
Treatment

- Conservative treatment is adequate in majority of cases, including:
 - Rest, ice and heat
 - NSAID's
 - Activity modification
- Surgery considered after 4 to 6 months if conservative treatment fails



Venous Thrombosis

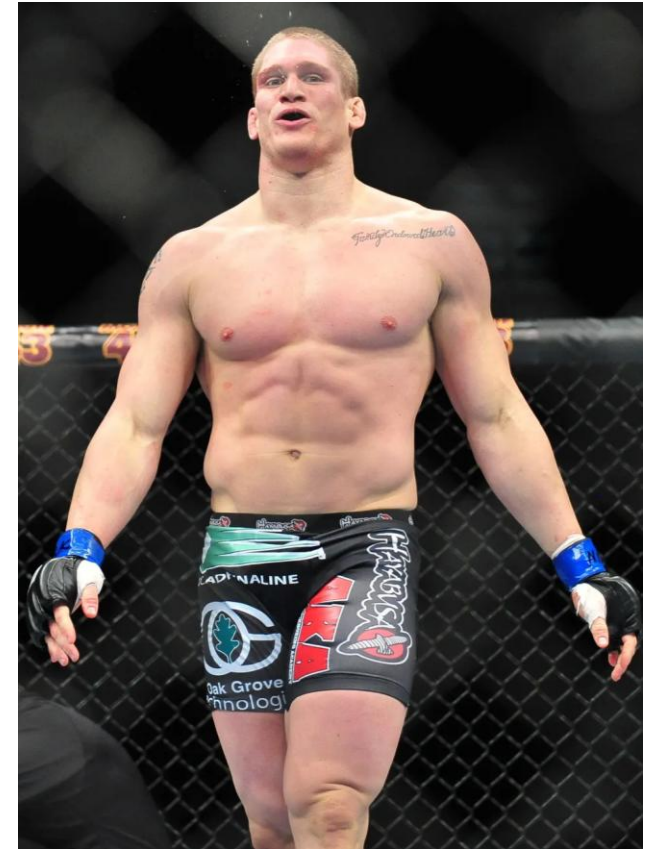
- Often referred to as Effort thrombosis or Paget-Schroetter Syndrome
 - Has sidelined several NBA players
- If d-Dimer test elevated:
 - Doppler ultrasound to make diagnosis
 - Venogram to confirm thrombosis
- Treatment:
 - Rest and elevation
 - Coumadin (for 3 mo).
 - Consider thrombolytic agents (Urokinase)
 - May need surgery to resect rib or callus



Brachial Plexitis

(Parsonage-Turner Syndrome)

- Idiopathic inflammation of the brachial plexus
 - Can be associated with athletic activity or trauma
 - Relatively rare condition
- Symptoms:
 - Intense shoulder pain and paresthesia.
 - Tender in axilla with minimal sensory loss
 - Weakness of proximal shoulder muscles (deltoid, supra, infra, biceps and triceps)



Todd Duffee
UFC Fighter

Brachial Plexitis

- Diagnostic evaluation:
 - Labs normal (ESR, CRP, CBC)
 - EMG is abnormal – showing diffuse plexus involvement
- Treatment:
 - Conservative – rest (sling), NSAID's, rehab as tolerated
 - May take weeks to years to recover
 - May see recurrences
 - Prognosis generally good – most recover within 2 yrs



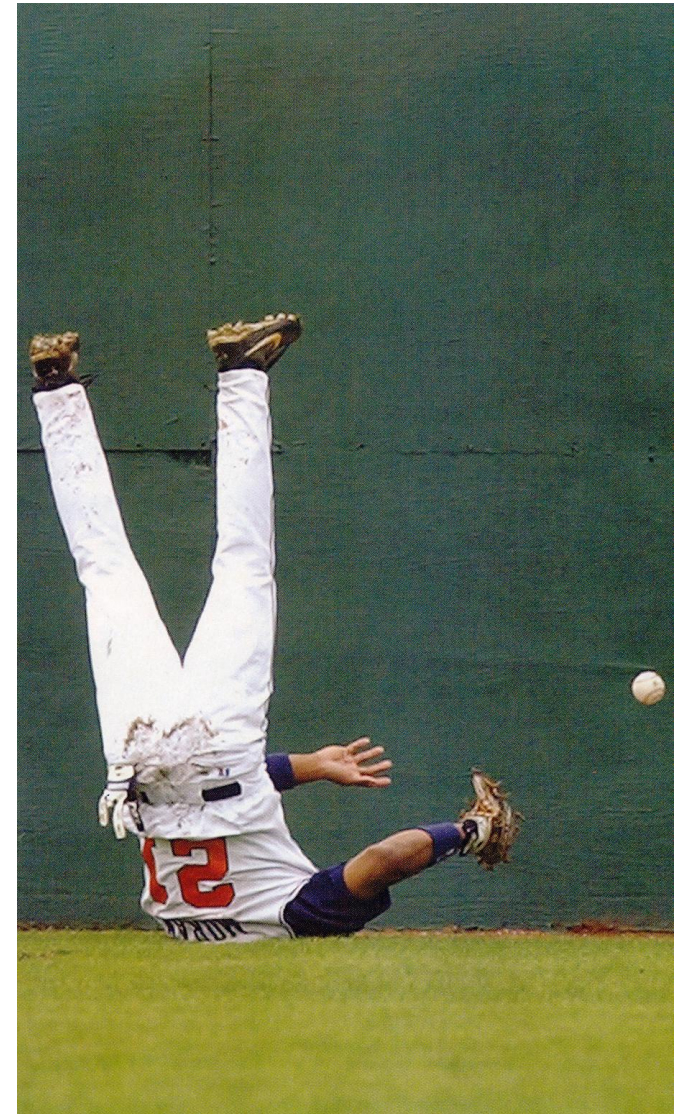
Backpack Palsy

- Backpack straps compress brachial plexus
 - Usually presses upper trunk of brachial plexus; C5-7
 - Numbness, tingling and pain down arm
 - More common on non-dominant side
- Most often effects deltoid, infraspinatus, biceps and wrist extensors
- Treatment is conservative (avoid pack and strengthen)



Summary

- Neck problems are common in the athlete and potentially catastrophic
- After trauma, assume a more serious spinal cord injury until ruled out by exam or imaging
- Burners are the most common sports related neck injury – especially in football
 - Treatment is symptomatic; return when symptoms resolve
 - Beware of underlying spinal instability
- TOS can present with a wide range of symptoms and often responds to conservative treatment



Questions?

