STINGERS & BURNERS: PERIPHERAL NERVE INJURIES

July 29, 2016

Jedediah L. Jensen, DO
Primary Care Sports Medicine
Bronson Sports Medicine Specialists
• I have no relevant or potential financial conflicts of interest in regards to material that I will discuss in this presentation.
PERIPHERAL NERVE ANATOMY

- Cell Body
- Axon
- Myelin
- Epineurium
- Perineurium
- Endoneurium
PERIPHERAL NERVE INJURIES

- Etiologies include:
  - Stretch or traction
  - Compression
  - Vibration
  - Laceration
  - Ischemia

- Most common etiology:
  - Upper extremity
  - Ulnar nerve
PERIPHERAL NERVE INJURIES IN NON-CONTACT SPORTS

• Relatively small percentage of all sports-related traumas

• Certain non-contact sports have a higher prevalence
  – Volleyball
  – Racquet sports
  – Cycling
  – Baseball / Softball
PERIPHERAL NERVE INJURIES IN VB

• Most common: suprascapular nerve entrapment at the spinoglenoid notch

• Painless weakness & atrophy of infrapsinatus
  – Dominant serving arm

• Estimated 33%-45% of symptomatic international players, 12% in asymptomatic players
• EMG – isolated infraspinatus denervation and motor unit loss.

• Pathomechanics:
  – Increased shoulder ROM
  – Impingement of infraspinatus branch of suprascapular nerve
  – between edge of spine of scapula and medial tendinous margin between the infraspinatus and supraspinatus muscles
• Almost exclusively peripheral nerve injury to the dominant arm

• Posterior interosseous nerve, entrapped within the arcade of Frohse
  – Wrist and finger extensor weakness

• Suprascapular neuropathy
  – Repetitive overhand serving
  – Similar to volleyball players
• Constrictive wristbands
  – Superficial radial neuropathy
• Two common peripheral nerve injuries:
  – Ulnar neuropathy at the wrist
    • “Cyclist palsy”
  – Pudendal neuropathy
• Numbness and paresthesia in ulnar distribution
  – Fifth finger, ulnar half of the ring finger
  – Weakness of the intrinsic muscles

• Long-distance bikers
  – Independent of handle bar design

• Pathomechanics: Compression of ulnar nerve at the wrist for prolonged time
TREATMENT – ULNAR NEUROPATHY

• Conservative
  – Temporary rest from cycling
  – Gloves
  – Padded handlebars
  – Hand position changes during long rides

• Rarely surgery indicated:
  – Surgical decompression of Guyon’s canal
• Symptoms
  – Genital numbness – 61%
  – Affecting penis, scrotum, and/or perianal area
  – Erectile dysfunction – 24%

• Pathomechanics:
  – Direct compression of the pudendal nerve
  – Can occur proximally or distally
    • More distal compression- penile anesthesia alone
PUDENDAL NEUROPATHY TREATMENT

• Conservative:
  – Temporary rest from cycling
  – Change of sagittal design
  – Shift weight from perineum to buttocks
  – Seat changes:
    • Wider seat, padded seat, flexible nose, positioning saddle nose downward
  – Decreasing height difference between seat and handlebar
  – Riding breaks, position changes

• Rarely surgery indicated
  – Surgical pudendal nerve decompression
PERONEAL NERVE INJURY

• Most commonly injured lower extremity nerve

• Injury at the fibular head
  – Knee injury
    • ACL, PCL, LCL, knee dislocation

• Also occurs at the ankle

• Compartment syndrome
• Pathomechanics:
  – Repetitive torque motion

• Nerves Injured:
  – Axillary nerve
  – Ulnar nerve
  – Radial nerve
  – Suprascapular nerve
• Valgus force on medial elbow
  – Elbow flexed, wrist extended
  – Acceleration phase

• Ulnar nerve transposition

• Treatment:
  – Conservative – rest, modify throwing
  – Surgical decompression
ULNAR NERVE vs RADIAL NERVE

• Ulnar nerve
  – Baseball pitchers
    • Overhand throwing

• Radial nerve
  – Softball pitchers
    • Underhand throwing
THROWING ATHLETE – SUPRASCAPULAR NERVE

• Similar to volleyball players
  – Increased ROM

• Suprascapular notch
  – Denervation of BOTH supraspinatus & infraspinatus
  – Shoulder weakness and **PAIN**

• Spinoglenoid notch
  – Infraspinatus alone is affected
  – Branch of the supraspinatus spared
  – Shoulder weakness **WITHOUT PAIN**
AXILLARY NERVE INJURY

• Rare

• Quadrilateral space syndrome
  – Compression of axillary nerve
    • Quadrilateral space
  – Fibrous band, ganglion cyst
  – Decreased space between teres major and minor
    • Late cocking phase of overhand pitch
CARPAL TUNNEL SYNDROME

• Most commonly found incidentally

• Higher risk sports:
  – Repetitive wrist maneuvers
    • Weight lifting
    • Cycling
    • Racquet sports

• Underlying medical etiology
  – Rheumatoid arthritis
• Prevalence of peripheral nerve injuries is country and culture specific

• United States and Canada
  – Most peripheral nerve injuries are sustained playing football
  – Wrestling and throwing sports
“STINGERS” & “BURNERS”

• Pathomechanics
  – Compression, distraction, direct trauma
    – C5 and C6 cervical nerve roots
    – Upper trunk of the brachial plexus

• Acute, TEMPORARY
  – pain and paresthesia in UE
FOOTBALL & WRESTLING

• Most, nerve injury in football players
  – Defensive player’s

• Also most common nerve injury and wrestler’s
RTP RECOMMENDATIONS

• Based on:
  – Number
  – Recurrence – same season
  – Degree of clinical sequelae

• 1 stinger, no sequelae
  – Return to play same day

• 2 or more stingers
  – Diagnostic evaluation-MRI, EMG
  – Prior to return to play

• 3 stingers same season or 3 stingers in different seasons with persistent symptoms
  – Removal from play for entire season
STINGER TREATMENT

- Rest
- Avoidance of repetitive trauma
- Padding
- Neuroglide Techniques
REFERENCES

- ACSM’S Sports Medicine A Comprehensive Review
- Cahill BR. Quadrilateral space syndrome. J Hand Surg Am, 1983
- Kennedy J. Neurologic injuries in cycling and bike riding, Neurol Clin. 2008
- Sinson G. Windmill pitch’s radial neuropathy, Neurosurgery. 1994
- Spinner RJ, Surgery of peripheral nerve and brachial plexus injuries or other nerve lesions. Muscle Nerve. 2000
- Toth C. The epidemiology of injuries to the nervous system resulting form sports and recreation. Neurol Clin. 2008
- Treihaft MM. Neurologic Injuries in baseball players. Semin Neurol.
Thank you!
bronsonhealth.com