



Nerve Injuries in Cyclists



Alison Brooks MD MPH
UW Cycling Symposium
March 3, 2009



"Compressions of a Cyclist"






Overview

- Nerve Injury 101

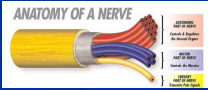
3 points of contacts

- Ulnar neuropathy (handlebar)
- Pudendal neuropathy (saddle)
 - Erectile dysfunction
- Foot paresthesias (pedal)

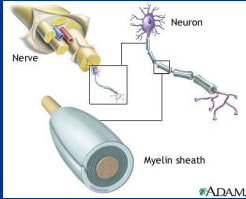
Nerve Injury

- Neuropathy: deranged function and structure of peripheral nerves
- Sensory: touch, pain, temperature
- Motor: muscle contraction
- Mechanism
 - Compression (ischemia)*
 - Stretch



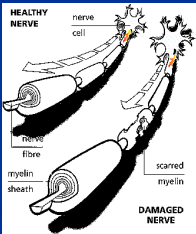
Nerve Injury

- Nerve contains neurons and blood vessels
- Susceptible to compression
- Pressure level
- Duration



Nerve Injury

- Nerve intact but not functional
- Mildest form of injury
- Focal demyelination
- Impaired conduction
 - Paralysis of body part
 - Sensory deficits



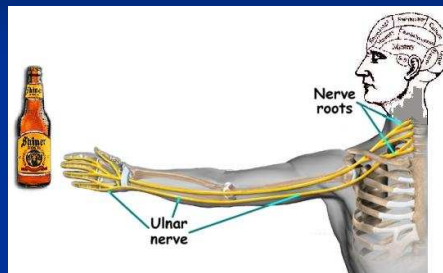
Nerve Injury

- Variable rate of recovery
- Amount and duration of compression (ischemia) determine degree of injury
- Remyelination must occur

→ Hours to weeks to months (12 weeks)

→ No ongoing compression

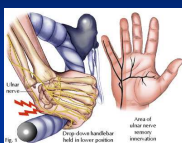
Ulnar Neuropathy



Ulnar Neuropathy

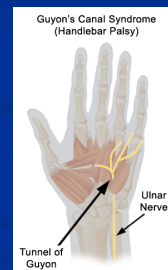
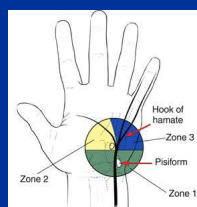
- “Cyclists’ or handlebar palsy”
- Prolonged grip pressure or wrist hyperextension

- *Sensory:** numbness/tingling in ring, little finger
- Motor:** weakness in hand



Ulnar Neuropathy

- Nerve compression at wrist
- Deep and superficial branches



Ulnar Neuropathy

- Bicycle fit: wrist position
 - Avoid hyperextension
 - Less weight on handlebars



- Padded gloves and handlebar tape
- Change hand position frequently



Median Neuropathy

- Less common
- Carpal Tunnel



Pudendal Neuropathy

Pudendal (Bikeseat) Neuropathy

- Neurovascular compression
- Between saddle and pubic symphysis (3)
- Perineal or genital numbness
- Women also affected

Erectile Dysfunction

- 1997 *Bicycling Magazine* article
 - >100,000 permanent ED from cycling
- Irwin Goldstein, MD:
 - **“I cannot say that sitting on a bicycle seat causes impotence. I can’t claim that long-term compression causes impotency.”**
 - **“There are two kinds of cyclists: Those who are impotent and those who will be.”**

Erectile Dysfunction

- Hippocrates (400 B.C.)
- Scythians north of Black Sea
- Nomadic horse people
- ED in wealthy with horses
- **“the constant jolting on their horses unfits them for intercourse”**

Erectile Dysfunction

- **Taylor 2004**
- Surveyed 688 cyclists, 18-77 years
- ED in younger and older cyclists
- ED prevalence by age group same as gen popn
- No ↑ prevalence in cyclists
- No association with cycling variables
- Only risk factor was age

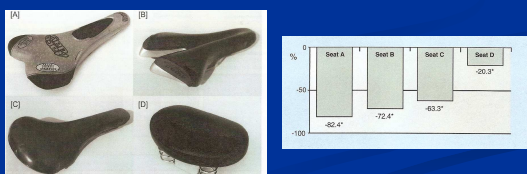
Erectile Dysfunction

- **Sommer 2001**
- 40 men, measured tpO_2 , seated, standing
 - Seated cycling decreased tpO_2 by two-thirds
- Interviewed 100 male cyclists
- 61% reported genital numbness, 17% ED
 - No case of ED without genital numbness but + numbness without ED

Erectile Dysfunction

■ Schwarzer 2002

- Wider saddle and absent nose protects penile blood flow



Perineal Pressure



- Affected by width/shape of rear, nose of saddle
- Standing vs upright vs racing position
- ↑ pressure can reduce penile blood flow
- Heavier riders ?
- Handlebar pressure, stability, handling ?

Get that pressure away from your perineum..... with RIDO



Erectile Dysfunction

- Perineal pressure affects penile blood flow
- Hypoxemia of penis associated penile fibrosis
- Unclear relationship: numbness ~ ED
- Case reports
- No large scale trials



➔ Link between cycling and ED controversial

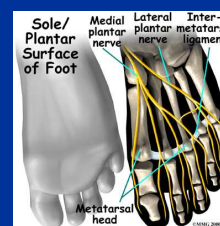
Pudendal Neuropathy

- Bike fit
 - Saddle angle
 - Saddle height
- Design of saddle
 - Wider, padded, flexible nose, cutout
- Out of saddle (20-30 sec/10 min)
- Padded shorts
- Short-term cessation (3-10d)



Foot Paresthesias

- Plantar forefoot numb, "hot" or painful
- Interdigital nerves compressed by metatarsal heads



Foot Paresthesias



- Less pedal pressure
- Cleat position
- Pedal platform
- Shoe tightness
- Shoe sole
 - Firmness
 - Worn
- Arch support, metatarsal button



Summary

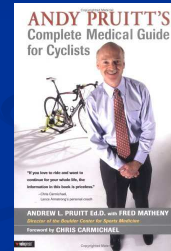
- Nerve injury affects sensory +/- motor
- Degree of injury: amount, duration
- Nerve must regenerate (up to 12 weeks)
- No ongoing compression
- Check bike fit first (saddle height, position)
- Equipment changes
- Controversial link between ED ~ cycling

References

- Mellion MB. Common Cycling Injuries: Management and Prevention. Sports Med 1991; 11(1): 52-70
- Sanner WH and O'Halloran WD. The Biomechanics, Etiology, and Treatment of Cycling Injuries. J Am Podiatr Med Assoc 2000; 90(7):354-376
- Kennedy J. Neurologic Injuries in Cycling and Bike Riding 2008; 26:271-279
- Silberman MR et al. Road Bicycle Fit. Clin J Sport Med 2005; 15(4): 271-276
- Asplund C et al. Genitourinary Problems in Bicyclists. Curr Sports Med Rep 2007; 6:333-339
- Campbell WW. Evaluation and Management of Peripheral Nerve Injury. Clin Neurophysiology, 2008; 119:1951-1965
- Taylor JA et al. Bicycle Riding and Its Relationship to the Development of Erectile Dysfunction. J Urology 2004; 172:1028-1031
- Sommer F et al. Impotence and Genital Numbness in Cyclists. Int J Sports Med 2001; 22:410-413
- Schwarzer U et al. Cycling and Penile Oxygen Pressure: the type of Saddle Matters. Europ Urology 2002; 41:139-143

References

- Andy Pruitt's Complete Medical Guide for Cyclists, Velopress 2006



Questions ?

