

# Brachial Plexus Neuritis vs. Saturday Night Palsy

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## Non Traumatic Brachial Plexus Injury

## Weird Stuff

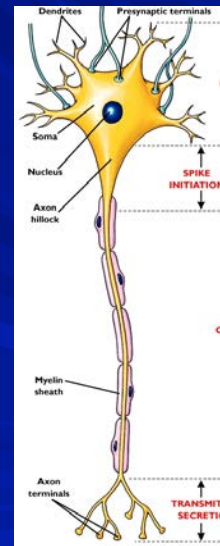


## Today

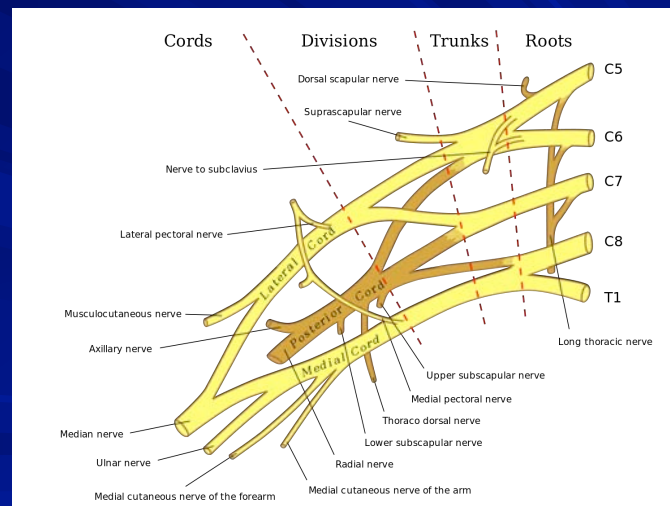
- Review
- Compression-”Saturday Night Palsy”
- Idiopathic “Parsonage Turner”
- Radiation Neuritis
- Transverse myelitis
- Hereditary Pressure Palsy
- Questions

## Nerve Anatomy

- Dendrite: receives information from other neurons
- Neuron
  - Cell body (Soma): metabolic activity
  - Axons: anterograde and retrograde transport
- Cell body
  - Sensory: Dorsal root ganglion
  - Motor: Anterior horn
- Axon terminal fibers
  - Sensory end organs
  - Motor end plates



## Brachial Plexus



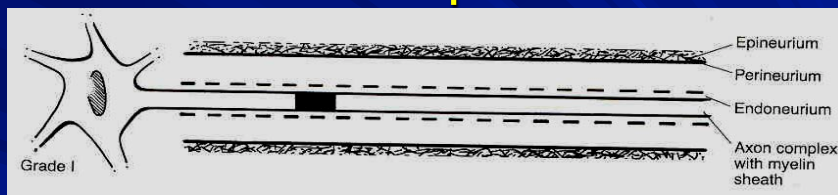
## Nerve injury “Many Varieties”

- Seddon [1943]
  - Neurapraxia
  - Axonotmesis
  - Neurotmesis
- Neuroma in continuity
- Mix of injuries



applianceinsider.com

## Neurapraxia



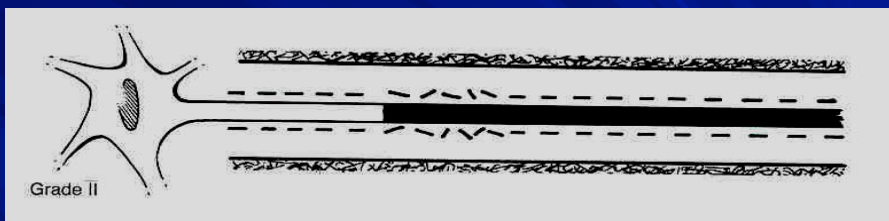
- Compression or stretch -> conduction block
- Axons are intact; no degeneration
- Motor and sensory loss
- Lasts weeks or months; *resolves spontaneously*

## Neurapraxia

- No EMG
- No Surgery
- Reassurance
- Splint as needed

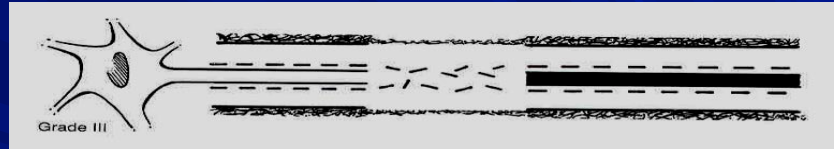


## Axonotmesis



- Crush or traction injury ->Axons disrupted & undergo Wallerian degeneration
- Supporting tubes are in continuity
- *Axonal regeneration through intact pathways allows functional recovery*

## Neurotmesis



- Completely transected nerve
- Endoneurial and perineurial elements are not in continuity
- Surgical repair is **required** to make axonal regeneration possible

## Denervation & Reinnervation

- Sensory
  - Sensory end organs may survive years of denervation
- Motor
  - Motor end plates die by 3 months
  - Functional re-innervation can be expected up to 1 year
  - No re-innervation can be expected after 3 years
  - The longer muscle denervated less final strength possible



## Time is money



- Earlier re-innervation=better functional recovery

donmillereducation.com

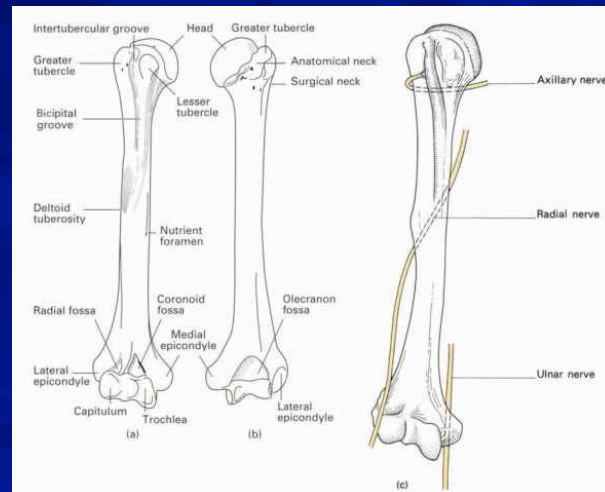
## Compression Who gets this?

- After artificially deep sleep
  - Alcohol, sleeping pills, head trauma
- Post surgical
  - Positioning, straps, assistant
- Prolonged ICU stay

## “Saturday Night Palsy”



## Radial Nerve Palsy



<http://www.medshiksha.com/radial-nerve-humerus-spiral-groove/>



## Wrist



## Treatment

- First is supportive
  - Splint
  - Contracture prevention
- Frequent physical exam
  - Advancing Tinnel's
  - Recovery of motor function



[johnbarban.com](http://johnbarban.com)

## If no recovery

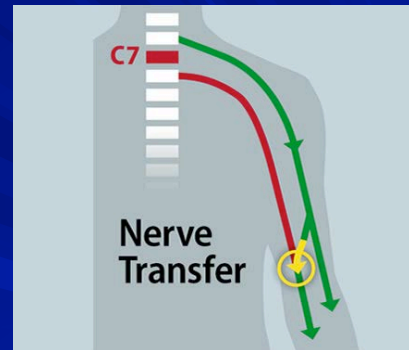
- 3 months
  - Get nerve studies
- 6 months
  - Repeat nerve studies
- No recovery at 6 months
  - Consider surgical intervention

## Surgery?

- Release any entrapments
  - Early surgery if suspected
- Nerve transfers
  - Should be done by 6 months
- Tendon transfers
  - No time limit

## Nerve transfer

- Use healthy nerves closer to the muscle to reconstruct the injury
- Often eliminate the need for a graft
- Been around along time but recent innovations have expanded use



## Parsonage Turner

- Brachial Plexus neuritis, neuralgic amyotrophy
- Paralysis of unknown etiology
- Rare-occurs 1–3 per 100.000



<http://emedicine.medscape.com/article/315811-overview>

## Pathophysiology Theories

- Autoimmune
- Viral
  - Hepatitis
  - Herpes
- Hereditary

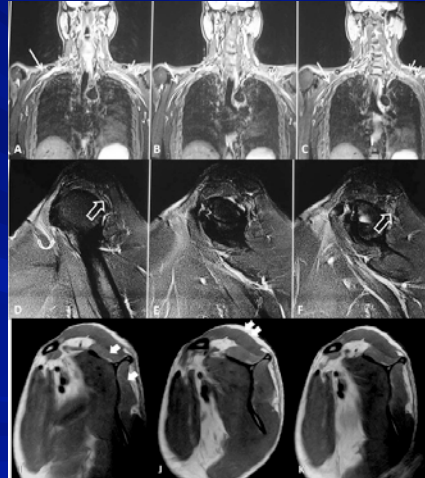
## Presentation

- Most often pain for a few days
- Followed by focal paralysis (can be bilateral)
- Many patients describe an antecedent event



## Diagnosis

- Rule out more proximal pathology
- MRI?
  - T2 Fat suppress
  - Show edema inflammation



J Med Case Rep. 2013 Nov 7;7:255. doi: 10.1186/1752-1947-7-255.

Utility of magnetic resonance imaging in the diagnosis of unsuspected cases of Parsonage-Turner syndrome: two case reports.  
Kumar J, Verma A<sup>1</sup>, Srivastava A, Shukla RC.

## Treatment

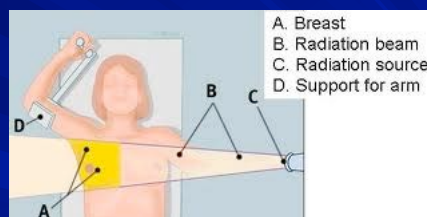
- Steroids?
  - No data but if autoimmune makes sense
- IVIG
- Supportive
  - Splinting
  - Prevention of contractures
  - Maintain stability

## Prognosis

- Variable
- 1/3 still have persistent deficits at 6 years
- Patients can recover in 1 month or show continued improvement over years

## Radiation Neuritis

- Progressive loss of function
- Increasing pain
- Breast Cancer, Hodgkins lymphoma....





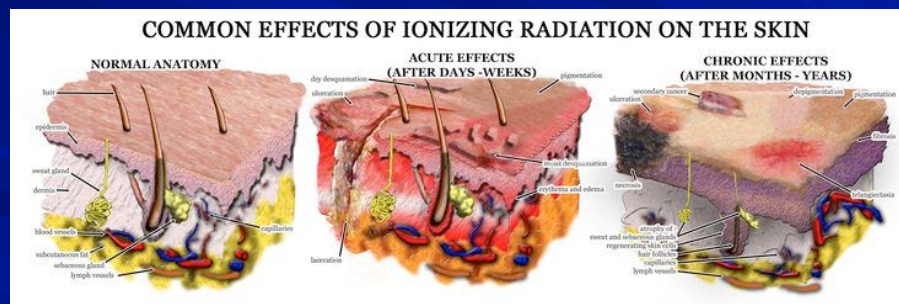
## Workup

- Can be years out
- Rule out recurrent tumor
- Often associated with lymphedema



## Pathophysiology

- Radiation results in fibrosis
- Loss of vascular supply
- Skin atrophy
- Lymphatic channel obliteration



[www.pinterest.com/736 x 245](http://www.pinterest.com/736x245)

## Treatment?

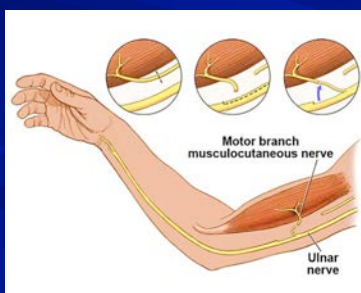
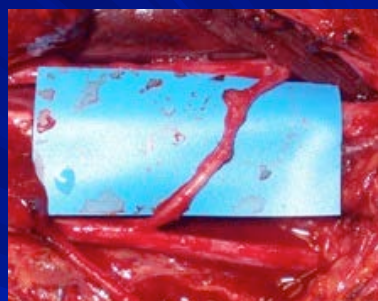
- Neurolysis and reconstruction with vascularized nerve graft
  - LeQuang C. Postirradiation lesions of the brachial plexus. Results of surgical treatment. *Hand Clin.* 1989 Feb;5(1):23-32.
- Nerve Transfers?
  - If nerve conduction block then distal nerve and muscle should be OK

[Nerve transfer for elbow flexion in radiation-induced brachial plexopathy: a case report.](#)

Tung TH, Liu DZ, Mackinnon SE.  
*Hand (N Y)*. 2009 Jun;4(2):123-8. doi

## Biceps

- Oberlin
  - Ulnar motor fascicle to musculocutaneous
  - Double fascicular



## Transverse Myelitis

- Inflammation of a segment of the spinal cord
  - 1/3 people have good recovery
  - No sign of recovery at 3 months a bad sign
  - Can result in destruction of the anterior horn cells
- Nerve Transfers?

[Nerve transfers for restoration of upper extremity motor function in a child with upper extremity motor deficits due to transverse myelitis: case report.](#)  
Dorsi MJ, Belzberg AJ.  
Microsurgery. 2012 Jan;32(1):64-7

## Hereditary Pressure Palsy

- Hereditary neuropathy with liability to pressure palsy (HNPP)
- Sensitivity to minor trauma
- Recurring palsies
- Several genetic abnormalities identified
  - Autosomal dominant
- Can be the cause of weird nerve palsies

## Weird

- Persisting "writer's cramp" as a result of compensation of a temporary palsy due to a HNPP.
- Moving toes and myoclonus associated with (HNPP).
- Brachial Plexus Injury after back pack use
- HNPP: global neuropathy after tourniquet use.

## Caution

- Strange story
- Recurrent palsies
- Send to neurologist for eval
- These patients can be fragile flowers



## Conclusion

- Wide variety of nerve injuries out there
- All need supportive care
  - Splinting
  - Prevention of contractures
  - Stabilization
- If no recovery at 3-6 months consider more aggressive care

Thank you