## **Preganglionic injury**

1. Horner syndrome: pre-ganglionic injury interrupts white rami communicantes

2. paralysis of serratus anterior (long thoracic nerve): produces winging of scapula

3. paralysis of rhomboids (dorsal scapular nerve)

4. early neuropathic pain suggests nerve root avulsion. MRI or myelogram will show pseudomeningoceles at the avulsed levels

5. EMG: requires  $\geq$  3 weeks from injury for some findings.

Look for:

a) denervation potentials in paraspinal muscles due to loss of neural input. The posterior ramus of the spinal nerve originates just distal to the dorsal root ganglion. Due to overlap, cannot localize to a specific segment

b) normal sensory nerve action potential(SNAP):preganglionic injuries leave the dorsal ganglion sensory cell body and the distal axon intact, so that normal SNAP can be recorded proximally even in an anesthetic region

6. pseudomeningocele on myelography or MRI: suggests nerve root avulsion (very proximal); however, 15% of pseudomeningoceles are not associated with avulsions, and 20% of avulsions do not have pseudomeningoceles  $^{1)}$  <sup>2)</sup>

root avulsion (preganglionic injuries) have worst prognosis not repairable.

Determining the exact location of dural violation after traumatic pre-ganglionic (avulsion) injury of the brachial plexus with associated progressively enlarging pseudomeningocele is critical for treatment, but current imaging by MR and CT myelogram remains inadequate as there are often only indirect imaging features. Lee et al. published the first case of using dynamic CT myelography to visualize "CSF flow jet," revealing the exact location of dural violation resulting in the expanding pseudomeningocele, providing crucial information for perioperative planning <sup>3</sup>.

## References

1)

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