

Hunter Soleymani¹, MD; Christine Hunt², DO, MS

(1) Department of Internal Medicine, Mayo Clinic, Rochester, MN, USA; (2) Department of Pain Medicine, Mayo Clinic, Jacksonville, FL, USA

INTRODUCTION

- Following traumatic brachial plexus injury (BPI) up to 95% of patients experience neuropathic pain.¹
- Managing chronic neuropathic pain due to traumatic BPI is complex and best accomplished by utilizing a multidisciplinary and multimodal approach.
- Treatment options range from conservative measures to advanced surgical techniques.

CASE PRESENTATION

- A 42-year-old female presented for management of chronic right upper extremity neuropathic pain in the setting of a traumatic BPI following being struck by a vehicle as a pedestrian.
- Cervical spine magnetic resonance imaging (MRI), brachial plexus MRI, electromyography, and eventual brachial plexus reconstructive surgery with nerve transfers identified a brachial plexopathy involving predominantly the upper and middle trunks with C5 and C6 nerve root injuries, and a complete C7 nerve root avulsion.
- Her pain was present throughout her right upper extremity, but most severe in her fingertips, especially the second digit. Over 10 months she underwent conservative management including various dosing and degrees of pain relief with gabapentin, pregabalin, amitriptyline, alpha lipoic acid, magnesium, acetyl-L-carnitine, acetaminophen, meloxicam, oxycodone, methocarbamol, medical cannabis, behavioral techniques, acupuncture, and occupational therapy.
- Due to continued pain, she was evaluated for possible neuromodulatory interventions by performing diagnostic blocks of the median and ulnar nerves which were successful. A temporary peripheral nerve stimulator (PNS) implant was subsequently placed targeting the median nerve with plans to place a lead on the ulnar nerve next. Unfortunately, she received minimal relief with the median nerve implant, and she wished to pursue spinal cord stimulator implantation rather than the ulnar nerve lead placement. The patient has an upcoming dorsal column spinal cord stimulator trial.

FIGURES

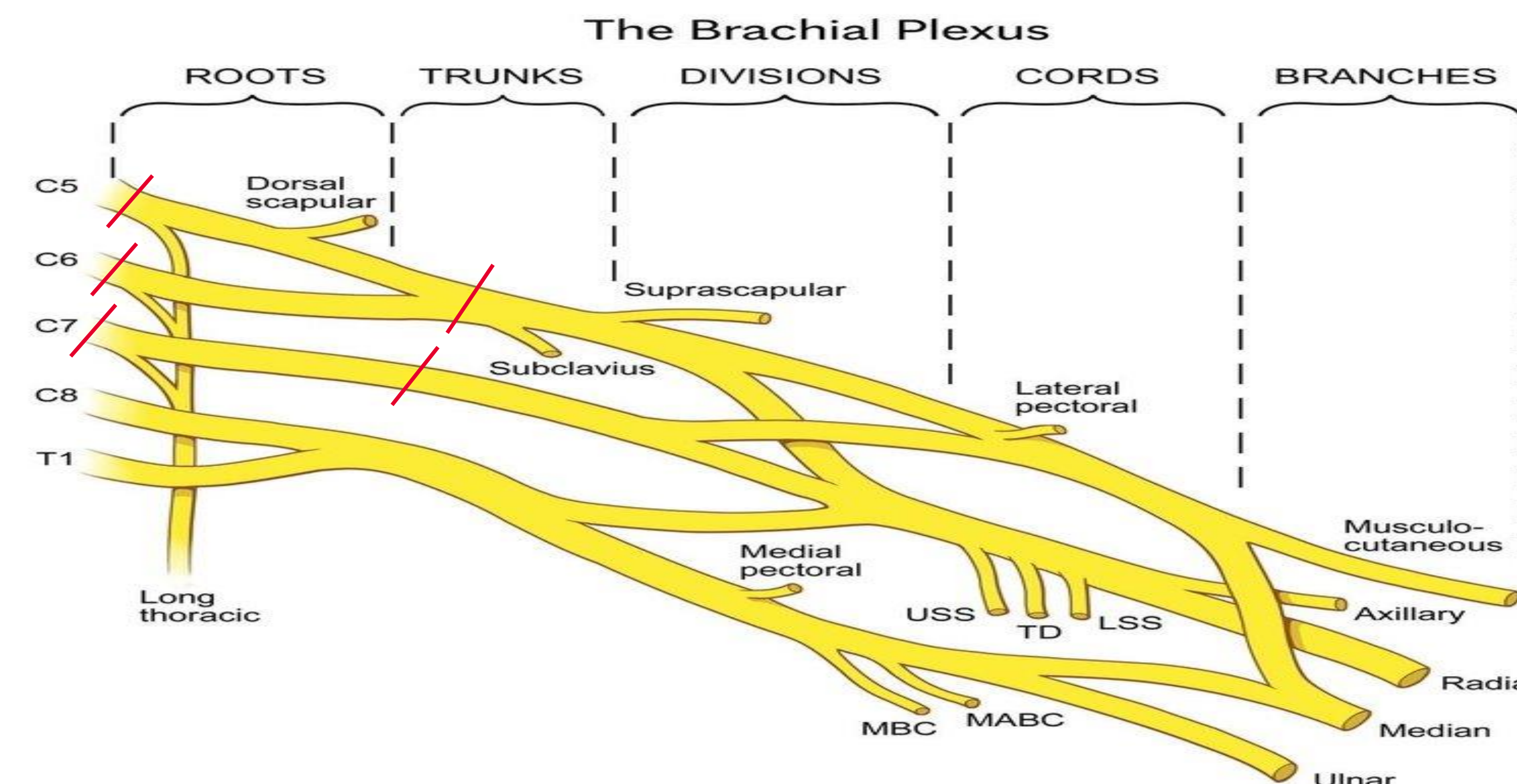


Figure 1. Example of the brachial plexus with demarcated sites of injury.

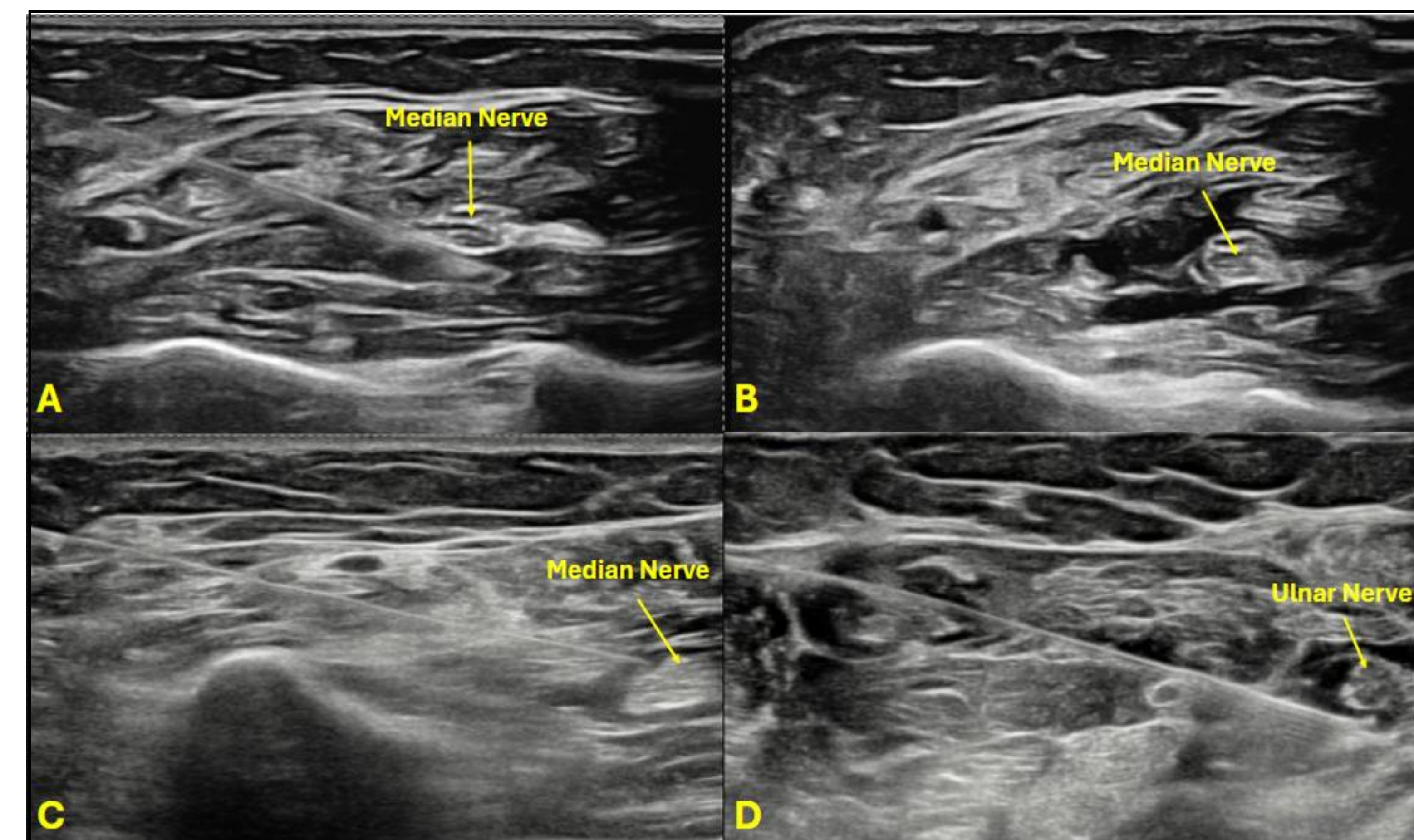


Figure 2. A-B: Diagnostic median nerve block at the level of the mid-forearm. C: Second diagnostic median nerve block at the level of the mid-forearm. D: Diagnostic ulnar nerve block at the level of the mid-forearm.

DISCUSSION

- Initial treatment of BPI often begins with a multimodal approach including physiotherapy, psychotherapy, topical medications, and pharmacotherapies.
- Common pharmacotherapy classes include anticonvulsants and antidepressants. Less commonly used classes include anti-inflammatories, antioxidants, muscle relaxants, opioids, and medicinal marijuana.
- For refractory cases, interventional approaches including reconstructive techniques (nerve repairs/transfers), modulatory techniques (brain or spinal cord), or ablative techniques (most commonly dorsal root entry zone (DREZ) lesioning) can be pursued.
- A recent meta-analysis found response to spinal cord stimulation (SCS) to be 86% initially and 69% after 12 months.²
- DREZ lesioning has shown promising improvements in pain but has a high percentage of unwanted and permanent side effects.³
- PNS is less commonly used for treatment of neuropathic pain related to traumatic BPI but has proven to be an effective option when placed on the nerve branch mainly involved in the pain syndrome.

CONCLUSIONS

- Traumatic BPI related neuropathic pain is an important clinical entity to recognize as possible sequelae following injury, and typically does not improve after nerve or tendon transfer surgery
- Interventional approaches, including neuromodulatory techniques may be indicated in refractory cases

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