

# Spinal Cord Stimulation Prevents Surgical Decompression in Setting of Brachial Plexopathy

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## Introduction

- Brachial plexus injuries can occur as a result of trauma, inflammation or malignancies, and associated complications.
- Brachial plexopathy can sometimes lead to severe chronic pain requiring multimodal pain control.
- There are many possible treatments ranging from the least invasive to the most invasive; including: oral neuropathic medications, desensitization therapies, physical therapy, neurolysis, nerve graft or transfer, and lastly muscle transfer.
- Recently, reports have been published in regards to spinal cord stimulation (SCS) as a viable treatment for plexopathy recalcitrant to conservative measures prior to more invasive surgical planning

## Methods

54 yo F with significant past medical history of rheumatoid arthritis on hydroxychloroquine and meloxicam, and cervical radiculopathy of the left upper extremity that was evaluated by Orthopedic Spine surgery. Electromyography and MRI results indicated C5-C6 axonal neuropathy with left paralateral C5-C6 disc herniation and decision was made to perform ACDF at that level

- ACDF of C5-C6 performed earlier in the year;
- Immediate improvement in pain, but insidious worsening weakness noted in C5 distribution 2 weeks following procedure
- At 4 week follow up her strength had continued to worsen and neuropathic pain ensued. Further MRI and EMG were ordered.
- EMG showed C5 axonotmetric injury with concerns for upper trunk injury.
- Patient referred to Plastic Surgery and hand clinic for possible nerve grafting and started on Lyrica for worsening neuropathic pain.
- MRI Brachial plexus reviewed with patient showing inflammation in plexus. Nerve transfers discussed if no improvement to provide stimulation to motor endplates until inflammation resolved.
- Patient seen by Pain Medicine at UK in referral from Plastics for possible less invasive interventions. Plans made to trial SCS for treatment of condition.
- Patient consented to trial SCS, put nerve transfer procedure on hold, increased Lyrica dosing with improvement of pain control.

## Results

### SCS Trial

- Patient presented for planned SCS trial for treatment of left upper extremity brachial plexopathy
- Epidural space entered at T11/12 interspace with stimulating leads aligned with inferior endplate of C2 vertebral bodies.
- Patient returned to PACU in stable condition with medical device representative adjusting device to optimal settings prior to discharge in stable condition.

### 1 week follow up after SCS trial

- Patient seen in clinic with >90% relief in follow up. Patient elected to forgo nerve transfer procedure with Plastic Surgery and to continue forward with SCS placement.

### SCS device implantation

- Patient seen at ASC for elective spinal cord stimulator placement
- Medtronic Intellis SCS utilized with Vectris leads for implant
- Patient had stopped smoking two weeks prior to procedure, and ASA held 7 days prior
- Epidural space entered at T12/L1 with 14 gauge 4 in. Touhy needles, at 45 degree angles in a paramedian approach following loss of resistance technique. The SCS lead was advanced to the top of the C2 endplate without issue. The same process was repeated at L1-L2 for the second lead. Leads were anchored to the thoracolumbar paraspinal fascia.
- Pocket site was created in the right low/back buttock with IPG template and tunneling device. Site closed in stage closure with 2-0 and 3-0 vicryl. Skin was closed with staples.



## Results

### 2 week post implant follow up

- Patient seen in clinic for wound check and staple removal.
- Continued pain relief in excess of 90%
- No wound complications or dehiscence noted. Patient instructed to continue precautions/activity restrictions, and to follow up in 1 month.

### 6 week post implant follow up

- Patient seen in clinic in follow up from procedure.
- She stated continued relief in excess of 90% from premorbid condition
- Patient instructed to continue follow up with Ortho Spine, and Plastic surgery and to follow up for planned weaning of Lyrica in light of improved condition.

## Conclusions

- SCS appears to be a viable treatment option for brachial plexus nerve injury with avoidance of more invasive procedure including surgical exploration or nerve transfer.
- A large multi-center RCT is recommended to confirm findings.

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