Brachial Plexus Stimulation, a Novel Approach for the Treatment of Upper Extremity Pain: A Case Series

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Disclosures

- This presentation does not contain off-label or investigational use of drugs or products.
- The authors of this paper have received no financial support to conduct this research. Both authors do wish to disclose that they are contracted by Stimwave Technologies to provide services as clinical proctors for the company.

What can be understood from this discussion?

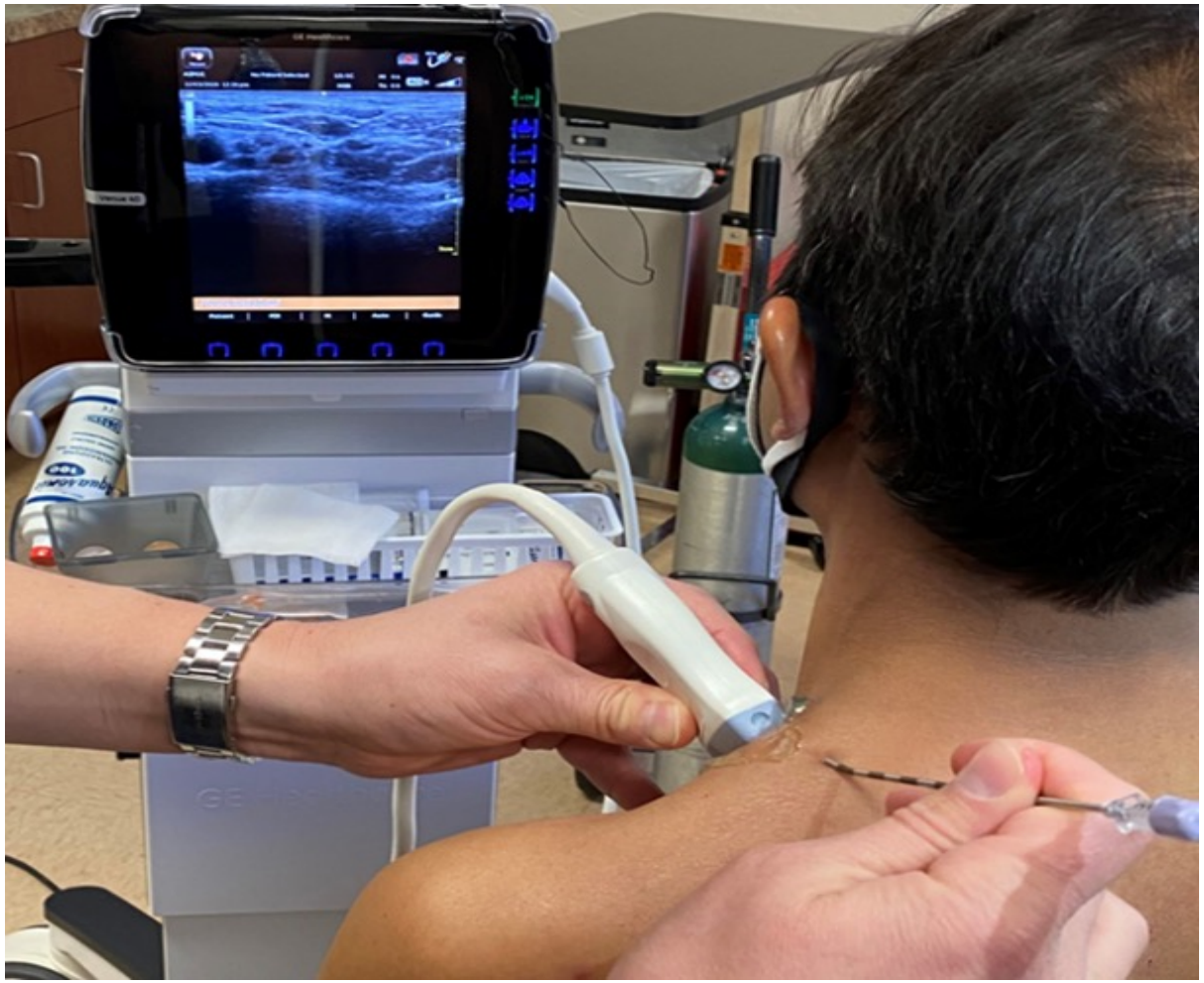
- Learning Objectives:
  - Identify patients with upper extremity pain that may be amenable to PNS therapy
  - Learn the safe and practical approach to stimulation of the brachial plexus
  - Learn how to collect data in your practice to assess the efficacy of your interventions

Objectives of the Case Series

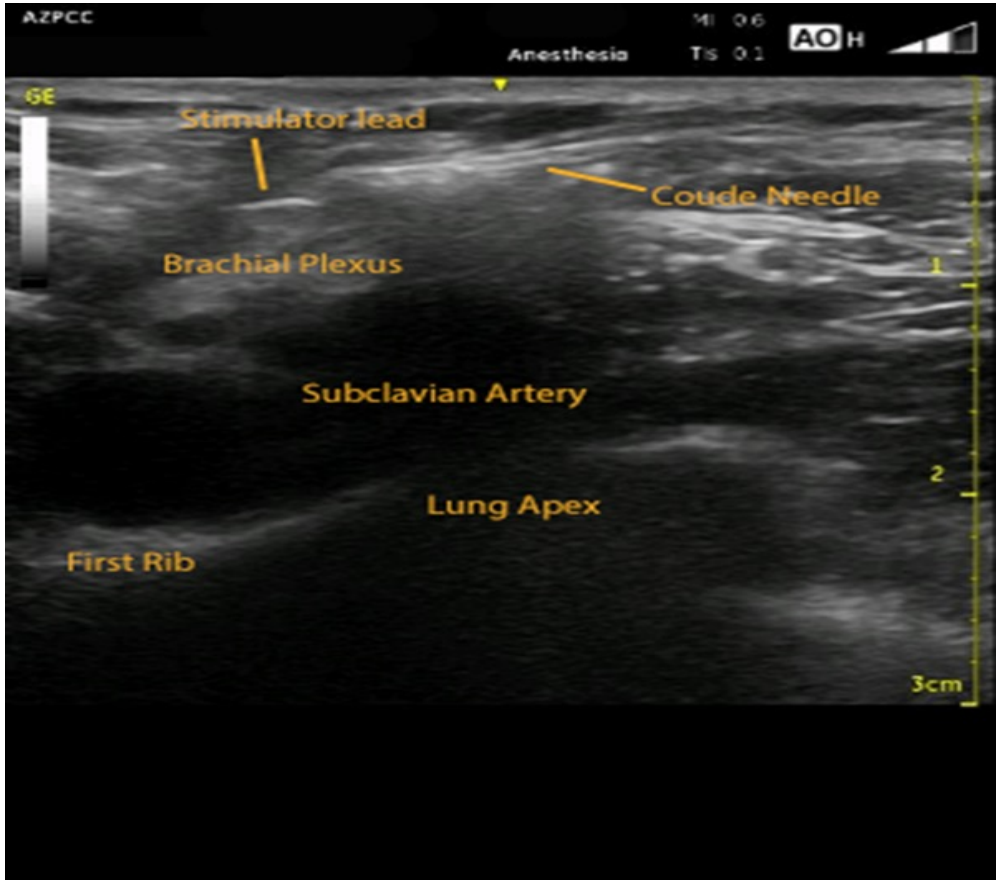
- Describe our technique
- Elucidate the efficacy of brachial plexus stimulation therapy for the treatment of upper extremity pain refractory to conservative measures
- Hypothesized that brachial plexus stimulation would be safe and effective therapy for patients with chronic upper extremity pain

Technique

- Similar to placement of continuous supraclavicular nerve block
- Ultrasound guided
- Utilize NACC guidelines (7)
  - Appropriate antibiotic prophylaxis
  - Sterile prep and drape



Technique



- Needle placed over brachial plexus
- Stimulator lead/array introduced through needle
- Needle removed
- Stimulator activated, paraesethesias noted
- Site appropriately dressed
- Trial conducted for 5 to 7 days

Methods

- Real-world case series
- 6 deidentified patients from our practice with chronic upper extremity pain
- Failed conventional and conservative therapies
- Responded to brachial plexus block
- Performed stimulation trial with at least 50% improvement in pain
- Questionnaires were provided to the patients -questionnaires were provided before permanent implantation and after one month after
- Safety outcomes observed

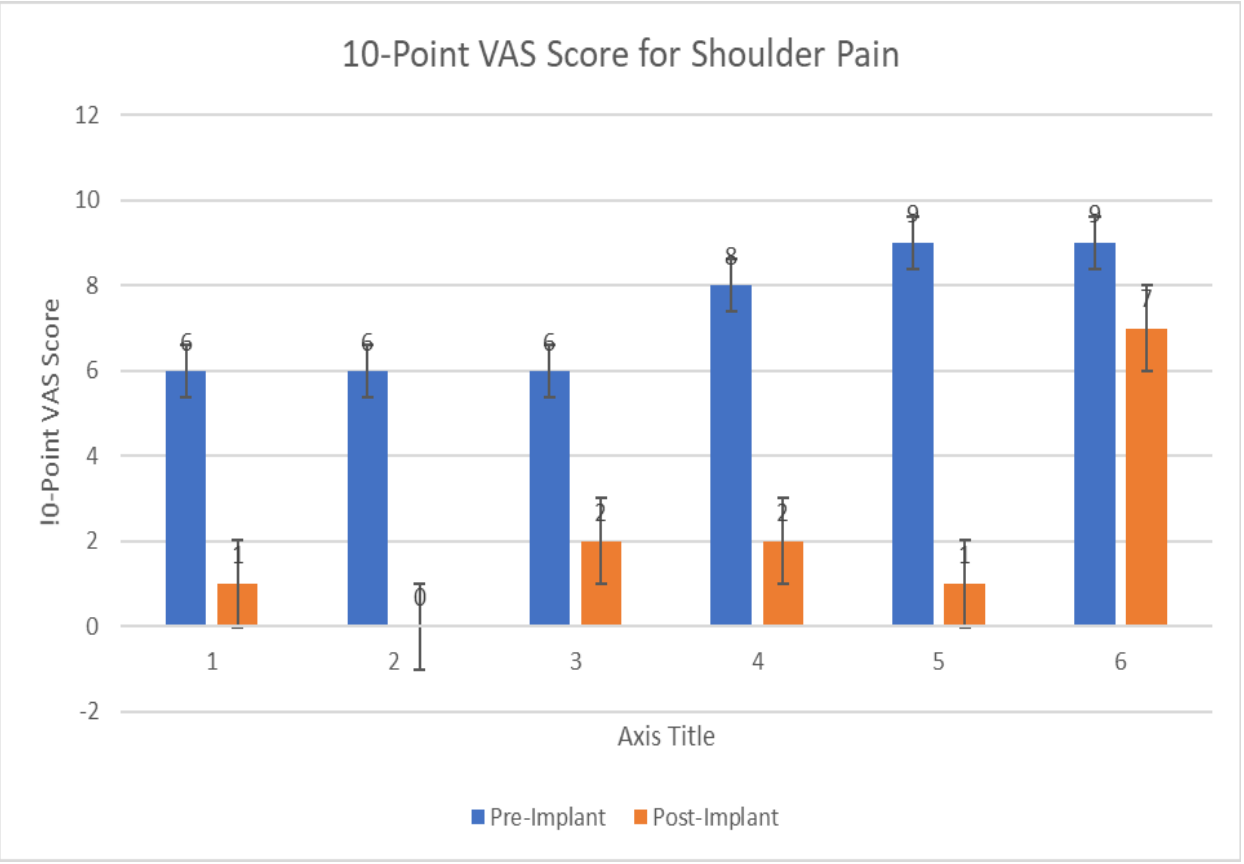
Self-reporting Questionnaires

- Oswestry Disability Score (ODI)
  - Patient perception of function
- Patient Impression of Global Change (PGIC)
  - Patient perception of efficacy of therapy
- EuroQol Visual Analog Scale (EQ VAS)
  - Patient perception of quality of life
- 10 point Visual Analog Scale (VAS)
  - Patient perception of pain

Patient Vignettes

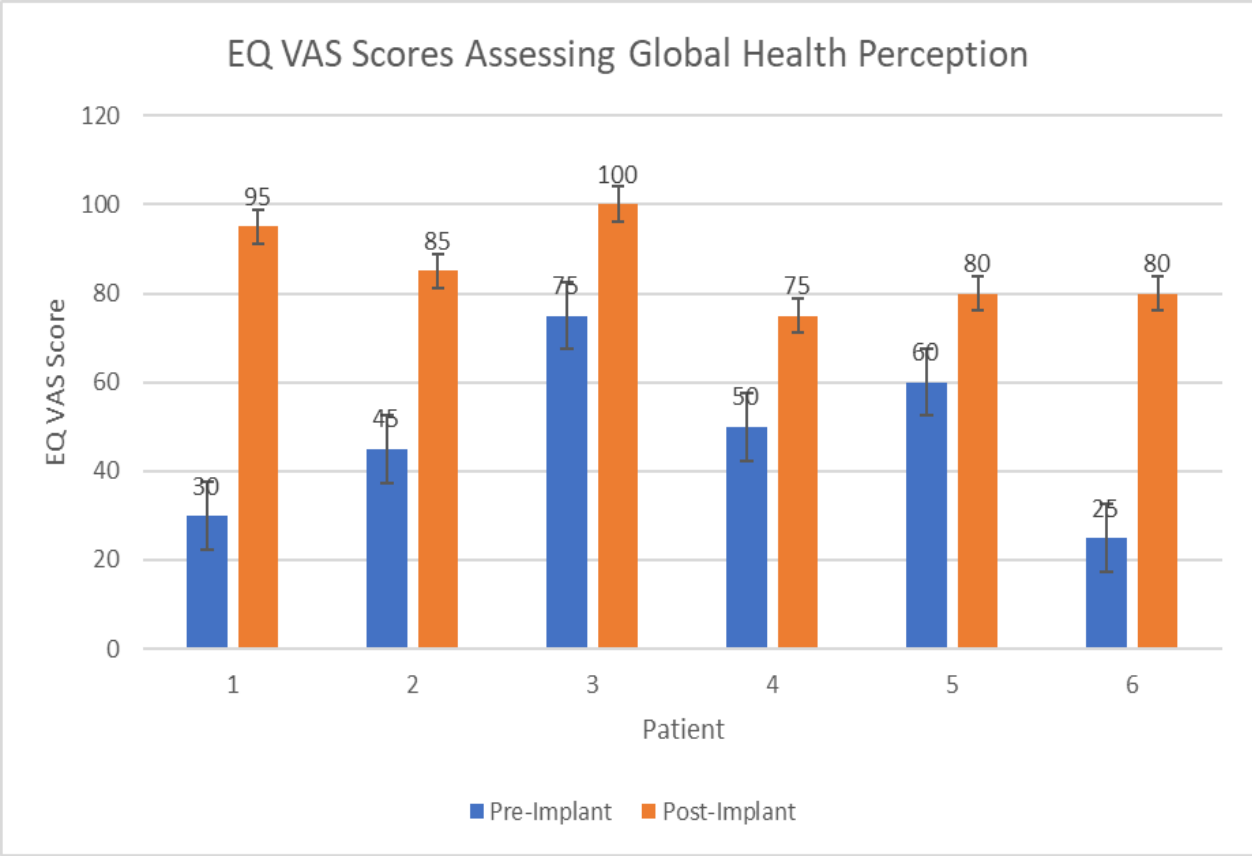
1. 72-year-old female with left thumb, forearm, and shoulder pain and weakness after a brachial plexus injury 9 months prior
2. 74-year-old female with chronic neck pain secondary to central stenosis radiating to both upper extremities who ultimately failed ESI, required surgery, but continued to have persistent left arm radiculopathy
3. 70-year-old female with chronic persistent left shoulder pain after left total shoulder replacement and posterior cervical spinal fusion
4. 65-year-old female with chronic neck and right shoulder pain secondary to foraminal stenosis at the C4-C5 who opted not to undergo cervical decompression
5. 45-year-old female with chronic bilateral shoulder pain secondary to a work injury six years prior who had failed conservative and interventional therapies
6. 69-year-old female who was referred to the clinic for chronic left shoulder pain with foraminal stenosis at the C4-C5 level who failed conservative and interventional therapies

Shoulder Pain Outcomes



- Shoulder pain improved after implantation for all six patients one month after implant

Perception of Global Health Outcomes



- All six patients felt improvement in their overall global health one month after implant

Patient Global Impression of Change Scores

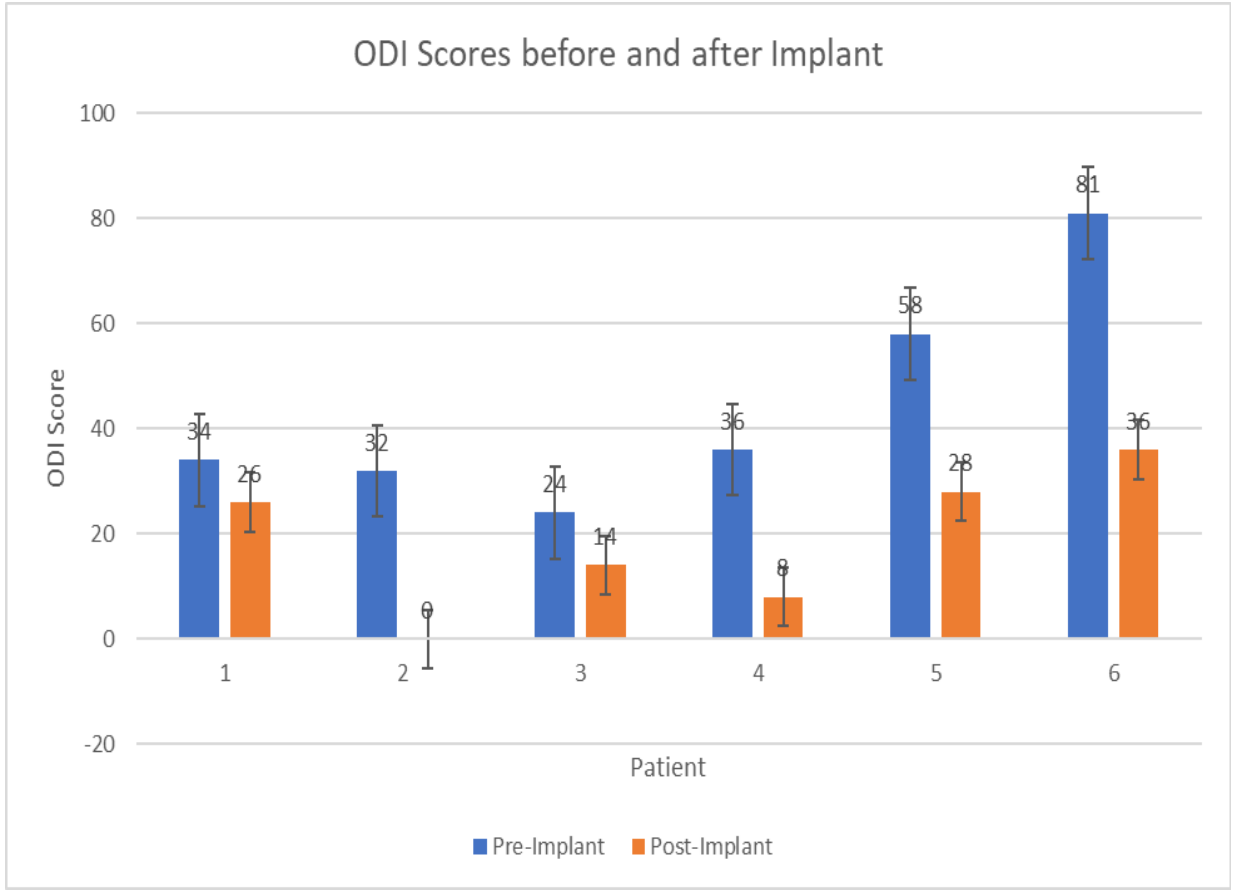
Patient		PGIC
1		6
2		7
3		7
4		7
5		5
6		6
Mean		6.333333
Median		6.5
Mode		7
StdDev		0.816497
StdErr		0.333333
CI (95%)		0.653321

PGIC Question and Scoring

Since beginning treatment at this clinic, how would you describe the change (if any) and activity limitations, symptoms, emotions, and overall quality-of-life related to your painful condition?

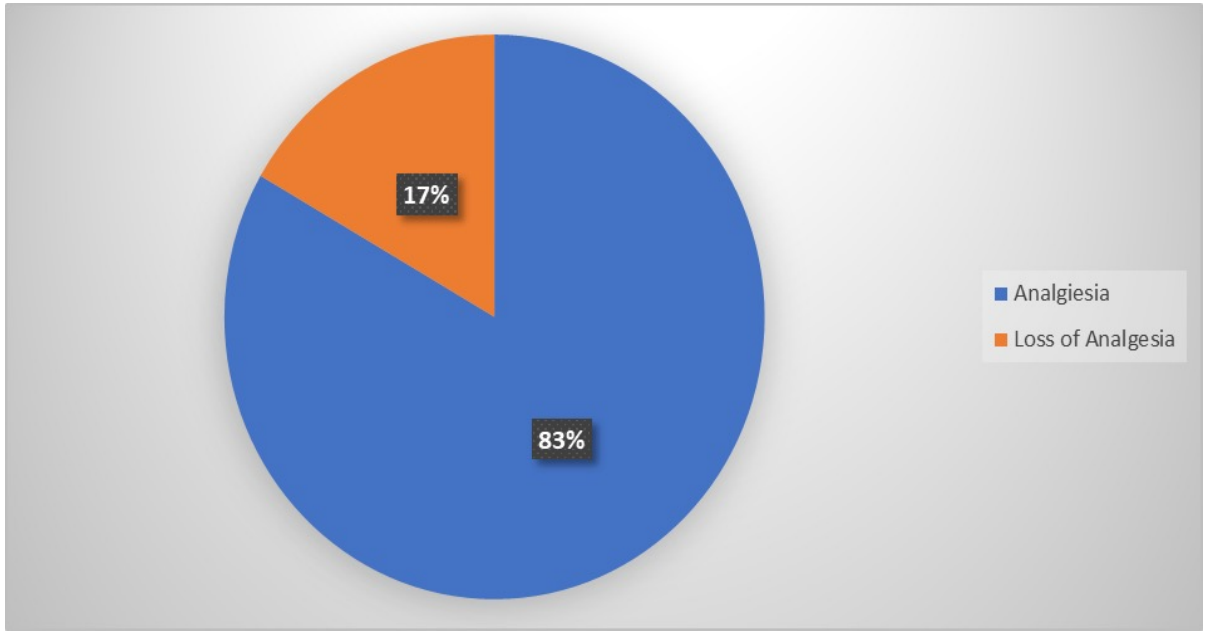
Score	Descriptors
1	No change or worse
2	Almost the same, hardly any change at all
3	A little better, but no noticeable change
4	Somewhat better, but the change has not made any real difference
5	Moderately better, and a slight but noticeable change
6	Better, and a definite improvement that has made a real and worthwhile difference
7	A great deal better, and a considerable improvement that has made all the difference

Functional Outcomes



- All patients reported improvements in functional capability
- Did not reach statistical significance
- Perhaps too short a reporting period and/or not enough patients

6 month outcomes



- 5 out of 6 patients had a sustained effect
- No patient experienced infection or injury related to the implant
- 2 patients required revision due to mechanical failure

  *One had a known fall

Discussion

- Brachial Plexus Stimulation is Safe
  - No infections or injuries
  - Should be performed by properly qualified practitioners with sufficient ultrasound experience
- Brachial Plexus Stimulation Appears to be Efficacious for Patients with Neuropathic Upper Extremity Pain
  - 83% of patients experienced continued benefit at 6 months
  - This is equivalent to cervical SCS therapy (4)
- Most Patients are Satisfied with the Therapy
- Simple Questionnaires can be utilized to help confirm efficacy and contribute to outcome data (8,9,10,11,13)

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Questions?

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