Spinal Cord Stimulation for Pain due to Brachial Plexus Avulsion.

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Introduction

Brachial plexus avulsion injuries usually result from automobile or motorbike accidents. Depending on the number of cervical roots that are affected, patients suffer from a varying degree of motor and sensory dysfunction, as well as neuropathic pain. Chronic pain affects 80% of those injured and is often more debilitating than any functional limitation[1]. Other injuries, differentiating between CRPS and neuropathic pain in the affected upper limb, prolonged hospitalisation and the psychological sequelae of the injury can make treatment challenging[2].

Medical management with anti-neuropathic agents often fails to provide adequate symptom control[3]. Interventions including peripheral nerve stimulation, cervical spinal cord stimulation (SCS), dorsal root entry zone lesioning and deep brain and motor cortex stimulation are all used. Increased access to SCS, improved electrode flexibility and advances in modes of stimulation may favour its use in the future.

Cases

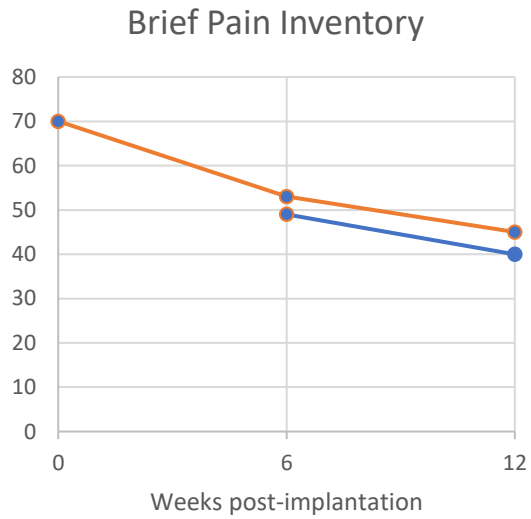
We describe two cases of brachial plexus avulsion with disabling neuropathic pain following road traffic accidents. Medical management and peripheral nerve blocks had not controlled the patients' symptoms. Both patients were assessed and implanted by a highly experienced multidisciplinary team with extensive experience in the field of neuromodulation. Both patients had on-table paraesthesia mapping confirming coverage of entire painful arm. Boston SCS systems using Avista electrodes and Wavewriter Alpha 16 IPG's were implanted; one patient had 1 electrode implanted, the other had 2. These were placed at the C4 – C6 level. Neither patient experienced any significant post-operative complications or issues.

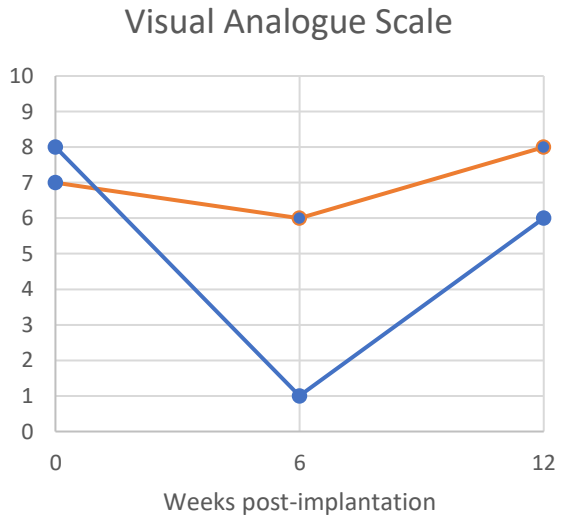
Conclusion

Our results show that adequate coverage of neuropathic pain following brachial plexus avulsion can be achieved using FAST programming on-table and immediately following SCS implant. Six weeks post-implantation, both patients reported significant improvements in pain. However, the benefit for each of our patients was short-lived thereafter. Subsequent trials of different stimulation programmes have not resulted in any significant improvement.

Analysis was quantitative and qualitative, with baseline and follow-up data self-reported via the National Neuromodulation Registry.

Patient 1		EQ5-5D-5L							Overall Change
Pre-op		1	2	3	4	2	12342	0.405	
6 weeks post-op		1	1	2	4	2	11242	0.498	-0.001
12 weeks post-op		2	2	3	4	1	22341	0.404	
Patient 2									
Pre-op		3	3	3	2	3	33323	0.541	
6 weeks post-op		2	2	2	2	1	22221	0.648	0.142
12 weeks post-op		2	1	1	3	2	21132	0.683	





References:

1. Bertelli JA, Ghizoni MF. Use of clinical signs and computed tomography myelography findings in detecting and excluding nerve root avulsion in complete brachial plexus palsy. J Neurosurg 2006;105:835–42.
2. http://dx.doi.org/10.5772/intechopen.82084
3. Teixeira MJ, da Paz MG da S, Bina MT, et al. Neuropathic pain after brachial plexus avulsion—Central and peripheral mechanisms. BMC Neurology. 2015;15:73.