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Effect of Short Term Spinal Cord Stimulation on Complete Traumatic Paraplegia

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Introduction

Angeli and colleagues in 2014 issue of Brain present a novel strategy for the treatment of Spinal Cord Injury. In their study, four patients with complete motor SCI regained voluntary movement of their legs through the epidural stimulation soon after implantation of the device (1)

The main limitation of this work is the small number of the enrolled patients and very expensive rehabilitation program (2)

It is still unknown if independent short term spinal cord trial without any rehabilitation program will have any effect on spinal cord functions in chronic complete paraplegia.

Methods

twenty patients with complete traumatic paraplegia for more than one year as documented with electro-physiological studies had spinal cord stimulation trial with low frequency tonic stimulation at the level of T11 T12 between June 2014 and October 2017.

Patients have the trial for five to seven days.

Results

Eight patients (40%) had positive results .

One patient (5%)had improvement of spasticity without any sensory or motor improvement

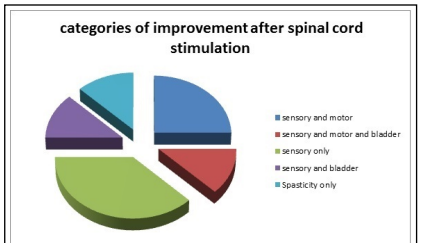
The other seven patients (35%) who improved all had improvement in superficial and/or deep sensation in addition to:

One patient (5%)had improvement of spasticity and bladder control in addition to sensory improvement without any motor improvement.

Two (10%) patients had improvement in ***motor power and sensation*** without significant improvement in bladder control.

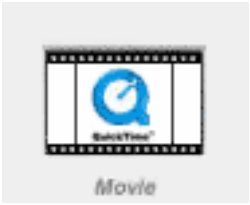
One (5%) of the patients had improvement in ***all functions***: motor power, spasticity and bladder control in addition to sensory improvement.

the remaining three patients had only improvement in sensation.



Patient	age	sex	Spasticity	Sensation	Bladder	motor
2	43	female		+++++		
5	28	female		+++++		+++++
6	18	male		+++++		
8	38	male	+++++			
11	24	male	+++++	+++++	+++++	
16	21	male	+++++	+++++	+++++	+++++
18	30	female		+++++		
19	29	male		+++++		+++++

Table 1- Pattern of improvement after SCS in complete traumatic paraplegia.



Conclusions

Spinal cord stimulation is a promising treatment for some but not all patients with chronic traumatic paraplegia. Further imaging and neurophysiological studies are needed to investigate the underlying factors that differentiate the non-responders and the different types of responders.

Our study showed that short term Spinal cord stimulation had significant rate of positive results.

It also showed that spinal cord stimulation has independently resulted in improvement without combination with expensive rehabilitation programs.

Waiting for further technological advances that can make spinal cord stimulation more affordable, ***We propose the feasibility of low cost short term spinal cord stimulation trial to predict response to the more expensive permanent implant similar to the situation in pain management***.

Learning Objectives

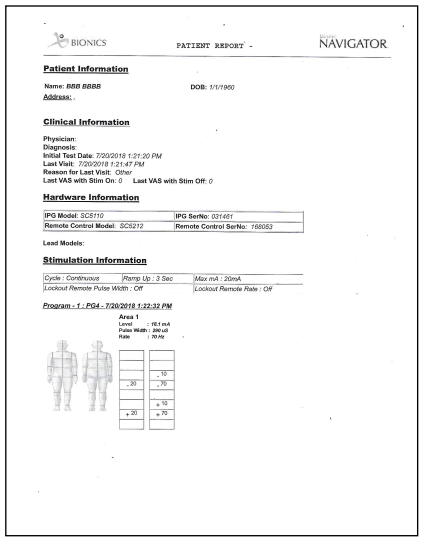
complete traumatic paraplegia has different types.

spinal cord stimulation is a promising treatment for traumatic paraplegia

References

1-Claudia A.Angeli, V. Reggie Edgerton, Yury P. Grasimenko and Suzan Harkima. Altering spinal cord excitability enables voluntary movement after chronic complete paralysis in humans. Brain 2014 1-16

2-National Institutes of Health. Spinal stimulation helps four patients with paraplegia regain voluntary movement. http://www.nih.gov/news/health/apr2014/nibib-08.htm. Accessed April 8, 2014.


BIONICS PATIENT REPORT - NAVIGATOR

Patient Information

Name: BBB BBBB DOB: 1/1/1960
Address:

Clinical Information

Physician:
Diagnosis:
Initial Test Date: 7/20/2016 1:21:20 PM
Last Visit: 7/20/2016 1:21:47 PM
Reason for Last Visit: Other
Last VAS with Stim On: 0 Last VAS with Stim Off: 0

Hardware Information

IPG Model: SC5110	IPG SerNo: 031461
Remote Control Model: SC9212	Remote Control SerNo: 168053

Lead Models:

Stimulation Information

Cycle : Continuous	Ramp Up : 3 Sec	Max mA : 20mA
Lockout Remote Pulse Width : Off		Lockout Remote Rate : Off

Program - 1 - PG4 - 7/20/2016 1:22:32 PM

Area 1
Level : 10.1 mA
Pulse Width : 200 uS
Rate : 70 Hz

			- 10
- 20		- 70	
			+ 10
+ 20		+ 70	