



Electrical Stimulation for Spinal Cord Injury

Complete paralysis after spinal cord injury had long been considered as an irreversible condition however after years of dedicated work, research and clinical experience Beike has developed a *state-of-the-art* treatment protocol for spinal cord injury patients which combines extensive stem cell treatment, specialized rehabilitation, and spinal cord stimulation together in one treatment.

1-Spinal Cord Stimulation:

A recent breakthrough of spinal cord stimulation by implanting an epidural electrical stimulator has shown to have helped patients regain voluntary motor function. In this technique a device is implanted in the epidural space (near the spinal cord) which continuously delivers electric current to the spinal cord. This electric current mimics the current delivered by the brain to voluntarily control the body's movements thus enabling the spinal cord to control those body movements on its own. The combination of *stem cell treatment, functional medicine, rehabilitation,* and the spinal cord stimulation makes this Beike treatment unique, and the first of its nature in the world.

General Procedure

1 day admission at local hospital, then back to Beike treatment facility, Better Being Hospital.

30 minute procedure under general anesthesia.

1 day post-operative rest then back to regular training schedule.

2- Stem cells factor:

Stem cells can replace damaged, diseased or lost cells by differentiating into neural and other cells. Moreover stem cells play many additional roles through paracrine effects, including the delivery of molecules, such as pro-survival factors, angiogenic factors, growth factors, stem-cell homing factors, and cytokines. These factors

- (1) Modulate the immune response towards the injury;
- (2) Induce the enzymes to reduce inflammation, scarring and promote the elimination of cellular debris;
- (3) Limit the secondary injury by protecting neurons;
- (4) Promote regeneration of endogenous stem cells;
- (5) Promote angiogenesis with more blood supply that is required for optimal recovery;
- (6) Enhance wound healing;
- (7) Provide a cell-based electrical 'relay' between neurons above and below the injury; to eventually ameliorate clinical deterioration.

3-Rehabilitation and Functional Medicine factor:

a) Functional medicine is used to help guide the patients to understand that modifiable factors such as diet, exercise, and supplementation are pivotal in improving patient's condition. While stem cell treatment will help in regenerating the diseased or damaged cells, functional medicine will help in creating a suitable microenvironment for stem cells to work. Moreover special training programs are provided for patients with special needs such as sensory integration, occupation therapy, physiotherapy, aqua therapy along with hyperbaric oxygen chamber and acupuncture.

b) Rehabilitation: Body weight supported training has been used for a number of years to promote the rehabilitation of spinal cord injured patients. It is thought to have an effect on the reorganization of locomotor networks along the spinal cord, generating new patterns of muscle activity. Other favorable effects have been reported, like the stimulation of serotonergic fiber growth after extensive rehabilitation. Furthermore, enhanced physical activity has recently been shown to lead to increased ependymal cell proliferation. The published data on "combination of stem cell treatment and exercise for SCI patients" has shown improved functional recovery if stem cell treatment is provided in combination to the rehabilitation.



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