EPIDURAL STIMULATION
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Epidural Stimulation Surgery / T7-T8, Nepal

Patient Case Report
#ES180038

Patient Overview

Age: 40
Sex: Male
Nationality: Nepalese
Diagnosis on Admission: Spinal cord Injury, Level T7-T8 Incomplete
Treatment Received: Spinal Cord Injury, Level T7-T8 Incomplete Treatment Received: Epidural Stimulation Surgery, Medtronic Restore Advance 16 electrode MRI compatible device. MSCs and hAFSC 120 million.
Date of Admission: 07/07/2018
Date of Discharge: 16/08/2018

Patient's Condition on Admission

Patient has suffered from traumatic spinal cord injury at T7-T8 level since May 31, 2015. His MRI scan showed T8 fracture dislocation with subsequent partial spinal cord myelomalacia. He suffers from loss of sensation and motor function in his bilateral lower limbs, bowel and bladder incontinence, and decreased mobility. Patient is paraplegic, so fine motor skills in his hands and fingers are normal.Patient is able to stand with support, but for only a short period of time. He does not have a history of spasticity, severe spasms/spastic attacks, or neuropathic pain. He is independent in his daily life activities.

Previous Therapies and Treatments

Patient received T6 to T10 pedicle screw fixation plus fusion with the bone graft. He received analgesics, IV fluids, and physiotherapy treatment before being admitted to Unique Access Medical's partner hospital. He experienced minor improvements in his condition.

Treatment Received

After going through a Spinal MRI scan, and comprehensive blood work, he underwent laminectomy and implantation of the epidural spinal cord stimulator on July 12th, 2018. The surgery and post-operative care proceeded without significant adverse effects and no serious complications were reported during the hospital stay. There was normal healing of the surgical wound.
Post-surgical device mapping and rehabilitation was carried out for 35 days, then the patient was discharged.

Post-Surgical Care	Total Sessions	Sessions Per Week	Time (Hr) Per Session
Mapping	96	24	1
Physical Therapy	29	7	1
Occupational Therapy	-	-	-

Cytotherapy

Type	Quantity	Delivery Method	Number of Applications
MSCs	40 Million	IV Injection	1
hAFSCs	80 Million	Lumbar Puncture Injection	2

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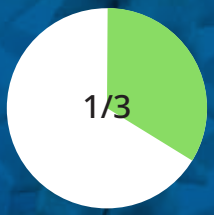
Symptoms Improvement Assessment after the Epidural Stimulation Surgery and Supportive Treatments:

Abilities & Symptoms	Motor & Sensory Function (below injury level, before ES surgery)	Improvement Observed (35 days after admission)
Motor Function		
Standing with support	Short period of time	Yes - for extended period
Stepping with support	Not possible	Yes
Gross motor Skills	Low	Yes
Fine Motor skills	Not Applicable- Normal	Not Applicable
Balance	Poor	Yes - improved
Coordination	Poor	Yes - improved
Muscle Mass	Low	Yes - improved
Fatigue	Present	Yes - improved
Stamina	Low	Yes - improved
Spasms	Not Applicable- no spasms	Not Applicable
Spasticity	Not Applicable- no spasticity	Not Applicable
Sensory Function		
Neuropathic pain	Not Applicable - no pain	Not Applicable
Bladder Function	No	No
Bowel Function	No	No
Sweating Ability	No	Yes

Improvement is monitored in 15 targeted areas - 11 of which represent Motor Functions and four represent Sensory Functions. Number of targeted areas may differ depending on patient's condition prior to admission. If patient experiences motor/sensory functions or is not impaired in a specific targeted area prior to surgery, it is excluded from the report (Not Applicable). If there is progress in any given area -- either mild, moderate, or significant -- it is measured and reported as positive ("Yes - Improved"). No improvement, existence of pain or spasms, or inability to perform a measured function is reported as "No".

Motor Functions

Sensory Functions



Overall Functions

Results Interpretation

Patient is paraplegic and has impairment in motor and sensory functions only from the waist down, therefore fine motor skills were not measured for this case. Patient does not have a history of spasticity, spasms, and neuropathic pain, so these have been excluded from the case report. Motor Function improved in 8 of 8 targeted areas when the Epidural Stimulation device was switched on. Sensory Function improved in 1 of 3 targeted areas. Overall improvement was seen in 9 of 11 of targeted Motor and Sensory Function Areas (81.81%).

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Summary

After Epidural Stimulation Surgery, patient received 96 mapping sessions and 29 physical therapy sessions. Patient also received 40 million MSCs through one IV injection and 80 million hAFSCs through two lumbar puncture injections. All treatments, including lumbar puncture injections, went well without adverse effects and no short-term or acute complications were reported during the treatment.

Improvements were noticed mainly in motor functions. Patient is able to have voluntary muscle control in lower limbs, stand up with support, and take assisted steps. He is able to lock his knee and take steps better on the right side than the left side, and with more physical therapy, we expect to see improvement in this area. Balance and coordination improved moderately. He is also able to stand with support for a longer period of time due to increased strength and stamina. Patient can sit up straighter when Epidural Stimulation device is switched on and can sit without back support. Patient is able to take coordinate steps, however it requires assistance in foot placement. With physical therapy, muscle mass in thighs noticeably increased to 3 cm after discharge.

During physical therapy, patient was able to sweat, therefore his sweating ability did improve. There was no noticeable change in bladder and bowel functions. Patient is not able to control or experience any sensation in these areas. Patient received cytotherapy, therefore we expect to see results in this area within 3 months time. After 35 days, patient was discharged, to continue his physiotherapy back home.

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