EPIDURAL STIMULATION
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Epidural Stimulation Surgery / T7, Romania

Patient Case Report
#ES180030

Patient Overview

Age: 25
Sex: Female
Nationality: Romanian
Diagnosis on Admission: Spinal Cord Injury, T7 Complete
Treatment Received: Epidural Stimulation Surgery, Medtronic Restore Advance 16-electrode MRI Compatible Device. MSCs and hAFSCs 120 million.
Date of Admission: 03/06/2018
Date of Discharge: 07/07/2018

Patient's Condition on Admission

Patient sustained a complete T7 spinal cord injury in September, 2016, resulting from a car accident. Patient has no motor function and very limited sensory function below the injury level. Patient suffers from neurogenic bladder and bowel, and from significant spasms and spasticity. She does not suffer from neuropathic pain, and is independent in her daily activities.

Previous Therapies and Treatments

Patient underwent spinal decompression surgery on October 13, 2016, and remained in hospital for one month for therapy.

Treatment Received

After a Spinal MRI scan, EMG, and comprehensive blood work, patient underwent Laminectomy and implantation of the Epidural stimulation device on June 4, 2018. The surgery was completed without significant adverse events and no serious complications were reported during the postoperative hospital stay. Surgical wounds healed normally and no spinal cord or superficial wound infection was reported.

Device Mapping and therapy were carried out after surgery for 35 days, then patient was discharged.

Device Mapping and Therapy

Post-Surgical Care	Total Sessions	Sessions Per Week	Time (Hr) Per Session
Mapping	92	23	1
Physical Therapy	27	6	1
Occupational Therapy	-	-	-

Cytotherapy

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

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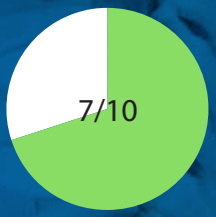
Symptoms Improvement Post-Surgery

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

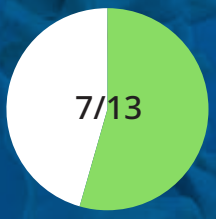
Improvements are monitored in 15 targeted areas: 11 Motor areas and 4 Sensory areas. However, the number of targeted areas may vary depending on patient's condition prior to admission. If patient does not experience symptoms in certain Motor/Sensory functions, or is not impaired in a specific targeted 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"). No improvement, the existence of pain or spasms, or an inability to perform a measured function is reported as "No".

Motor Functions



Sensory Functions

Overall Functions



Results Interpretation

Patient is paraplegic with normal upper limb function, therefore 10 of 11 Motor Function areas were measured. Motor Function improved in 7 out of 10 targeted areas when the Epidural Stimulation device was switched on.

Patient does not suffer from neuropathic pain, therefore 3 of 4 Sensory Function areas were measured. Patient has not experienced any changes in the three measured Sensory Function areas, but more feedback will be collected after 3 months to note any improvements made by Cytotherapy. Overall, improvements were recorded in 7 out of 13 targeted Motor and Sensory Function areas.

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Treatment Summary

After Epidural Stimulation surgery, the patient received 92 Mapping sessions and 27 Physical Therapy sessions. The patient also received 120 million: 40 million MSCs and 80 million hAFSCs through one IV injection and two lumbar puncture injections, respectively. All three applications went well without adverse effects and no short-term or acute complications have been reported.

Patient's Gross Motor Skills improved significantly. Patient has better trunk control and improvements were also observed in ankle, hip, and knee flexion. She demonstrated fair knee extension (kicking out) when Epidural Stimulation device is switched on -- she is able to push her legs out, however not when resistance is added.

Patient has good static sitting balance with minimal support required, but dynamic sitting balance is not possible yet. Patient required two people to assist in standing, but has good static standing balance with minimal support and is able to stand at the parallel bar and lock both knees and hips. Patient has good trunk control and bears weight equally on both legs while standing.

Patient did not require a hoist while standing or during stepping exercises. Patient experiences significant spasticity, so she had slight difficulties taking unassisted steps but is able to take assisted steps. Patient did require assistance locking knees and hips when stepping and was able to lift her feet, but required assistance in foot placement. Patient is not able to coordinate both legs during stepping exercises.

Muscle mass and endurance were improved upon discharge. However, the patient's spasms and spasticity increased after surgery. The overnight program for spasms and spasticity helped the patient sleep, but significant spasms resumed upon waking.

There was no noticeable improvement to her neurogenic bladder and bowel. Patient received cytotherapy, therefore we expect to see results in these areas within 3 months time. After 35 days, the patient was discharged and will continue her physiotherapy back home.

For more information please contact:

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