EPIDURAL STIMULATION
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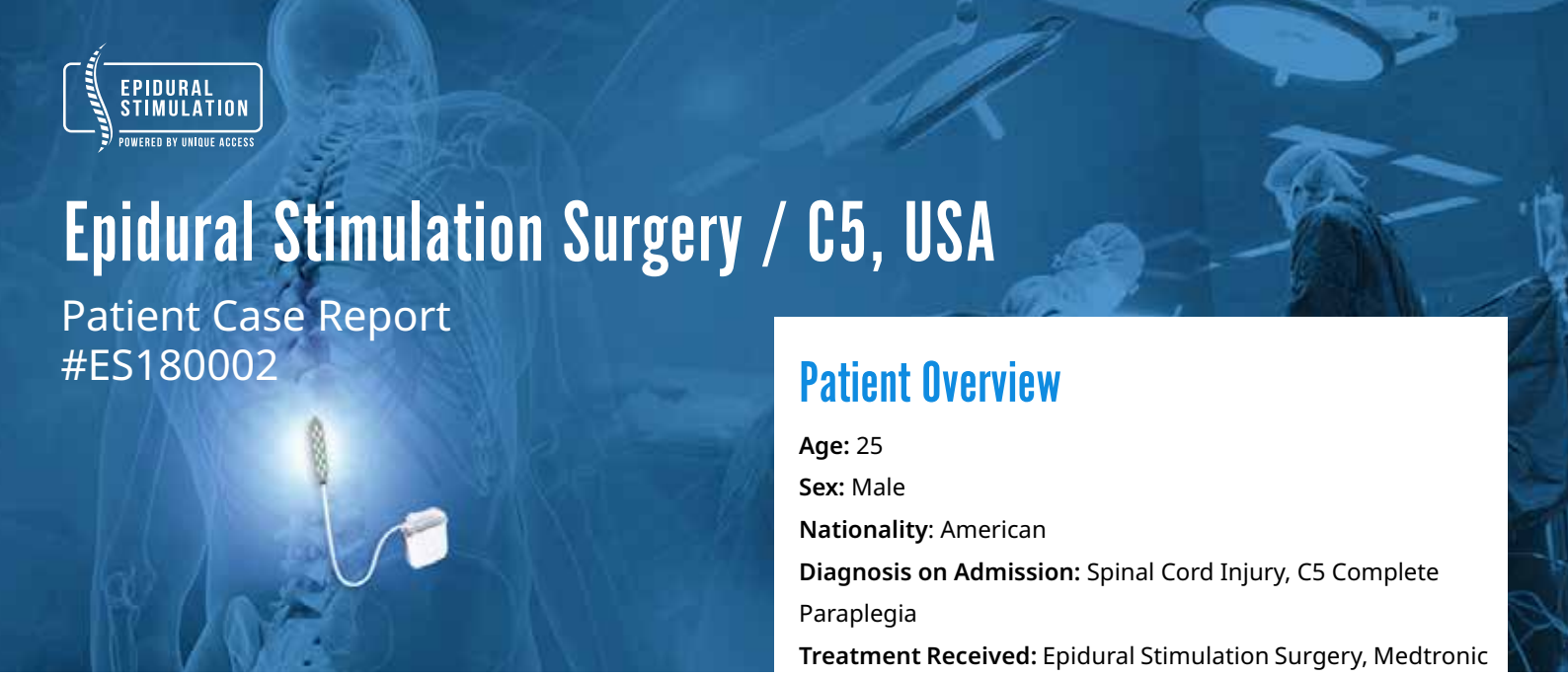
Epidural Stimulation Surgery / C5, USA

Patient Case Report
#ES180002



Patient Overview

Age: 25

Sex: Male

Nationality: American

Diagnosis on Admission: Spinal Cord Injury, C5 Complete Paraplegia

Treatment Received: Epidural Stimulation Surgery, Medtronic Restore Advance 16-electrode MRI Compatible Device. MSCs and hAFSCs 160 million.

Date of Admission: 10/01/2018

Date of Discharge: 18/02/2018

Patient's Condition on Admission

Patient sustained spinal cord injury at C5 level, characterized by incomplete quadriplegia and complete paraplegia, on January 1, 2016. Patient has limited hand and arm function, but no voluntary motor function in lower limbs. Patient suffers from neurogenic bladder and bowel, but does not suffer from spasms, spasticity, or neuropathic pain.

Previous Therapies and Treatments

Patient had spinal fusion surgery of the C5-7 and T9-10 vertabrae, followed by a 5-month rehabilitation program in the USA, in January, 2016.

Treatment Received

After a Spinal MRI scan, EMG, and comprehensive blood work, patient underwent Laminectomy and implantation of the Epidural Stimulation device on January 11, 2018. The surgery was completed without significant adverse events and no serious complications were reported during the postoperative hospital stay.

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	94	23	1
Physical Therapy	29	7	1
Occupational Therapy	12	3	1

Cytotherapy

Type	Amount	Delivery Method	Number of Applications
MSCs	80 Million	IV Injection	2
hAFSCs	80 Million	Lumbar Puncture Injection	3

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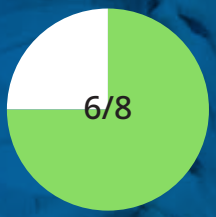
Symptoms Improvement Post-Surgery

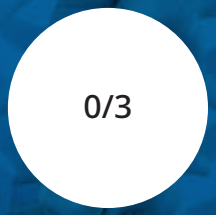
Abilities & Symptoms	Motor & Sensory Function (below injury level, before ES surgery)	Improvement Observed (35 days after admission)
Motor Function		
Standing with support	Not Possible	Yes
Stepping with support	Not possible	No
Gross motor Skills	Not Present	Yes
Fine Motor skills	Limited	No
Balance	Poor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

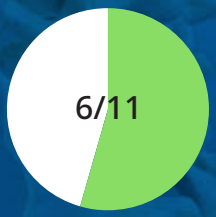
Motor Functions



Sensory Functions



Overall Functions



Results Interpretation

This patient was unable to take steps, therefore Coordination has been excluded from the report. There was also no history of Spasticity and Spasms, therefore they are excluded from the report. Motor Function improved in 6 out of 8 targeted areas when the Epidural Stimulation device was switched on. Patient does not suffer from neuropathic pain, therefore it has also been excluded from the report. Patient has not experienced any improvements in the other Sensory Function areas, but more feedback will be collected after 3 months to note any improvements made by cytotherapy. Overall, improvements were recorded in 6 out of 11 targeted Motor and Sensory Function areas.

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Treatment Summary

After Epidural Stimulation surgery, patient received 94 Mapping sessions, 29 Physical Therapy sessions and 12 Occupational sessions. Patient also received 160 million: 80 million MSCs and 80 million hAFSCs, through two IV injections and three lumbar puncture injections, respectively. All five applications went well without adverse effects and no short-term or acute complications have been reported.

Patient's Gross Motor Skills improved significantly. Improvement was seen in hip, ankle and knee flexion, as well as knee extension (kicking out) with added resistance. Patient has good static and dynamic sitting balance, good static standing balance, but no dynamic standing balance. Muscle mass and endurance were improved upon discharge.

Patient was able to stand at the parallel bar with the assistance of a hoist. While standing, he is able to lock his knees, however he requires assistance locking his hips. Patient has poor trunk control, but is able to bear weight equally on both legs. Due to orthostatic hypotension, patient's blood pressure drops too low to perform stepping exercises, so therapists focused on other areas during the Physical Therapy sessions

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

For more information please contact:

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