

Functional Rehabilitation of Cervical Spinal Cord Injury

Yash Mehul Kumar Agravat¹, Mukesh Doshi², Virendra Sandaliya³, S. Lognathan⁴, Ashok Trivedi⁵



URL:<https://ijptrs.com/view-issue/129/Fulltext>

DOI:<https://ijptrs.com/public/images/content/768Yash%20v3i1.pdf>

1B.P.T., Clinical Physiotherapist, 2 B.P.O., P.G.D.H.H.M., director, 3 C.P.O., Associate Director, 4M.O.T., Rehab Administrator, 5 B.P.T., Y.T.T.C., P.G.D.H.H.M., Clinical Senior Physiotherapist, Bidada , Kutch , Gujarat – 370435. Jaya Rehabilitation Institute & Reserch Centre.

Email: jayarehab@gmail.com

Submission: 24th September 2023

Revised: 22nd November 2023

Publish: 1st January 2024

©2023 Association of Health and Wellness Providers (AHWP)

Table of content

[Introduction](#)

[Patient History](#)

[Review of Literature](#)

[Methodology](#)

[Result](#)

[Conclusion](#)

[References](#)

TITLE : Functional Rehabilitation of Cervical Spinal Cord Injury

I have a single case study on a C6 C7 cervical spinal cord injury patient and shown some functional improvement.

INTRODUCTION:

The Spinal cord is part of the central nervous system (CNS). it is situated inside the vertebral canal of the vertebral column ⁽¹⁾ The spinal cord is divided into segments: cervical, thoracic, lumbar, sacral and coccygeal. the cervical spine has 7 stacked bones called vertebrae, labelled C1 through C7. The locations of the C6 – C7 vertebrae are both in the lowest levels of the cervical spine, near the base of the neck. the types of spinal cord injury corresponding to these regions of the spine have the potential to impact everything below the top of the ribcage – resulting in quadriplegia or paraplegia ⁽²⁾ C6-C7 spinal cord level is a group of muscles involved in straightening the elbow, lifting the wrist, elongating the fingers to an outstretched hand and the triceps muscle in the upper arm. The outcome of C7 is the ability to be physically independent with personal care and ADLs, independent with bed mobility, can transfer independently with the potential to use lift transfer, Greater function use to hands including stronger grasp and increased dexterity therefore less reliant on splints, able to use a manual wheelchair, able to drive with vehicle modifications, potential to live independently with support and require assistive equipment. As is the case with any spinal cord injury, the damage is characterized as complete or incomplete depending on the severity.

KEY WORDS: SCI Patient, SCIM, WISCI, Multidisciplinary Approach, Public Utility Services Training, Vocational Training, Sports Training and Institutional Rehabilitation.



PATIENT HISTORY:

Patient suffered an injury to cervical spine while diving into swimming pool on 12/05/2022 at night. He underwent surgery in afternoon at Surat on next day and here he was admitted for 3 days. After that he was at home rest 1 and half months then he took treatment for 2 months in hospital at Surat. Now he started treatment here Jaya rehabilitation center of Bidada from 10/11/2022.⁽³⁾

AIM:

To find the effectiveness of multidisciplinary approach for C6-C7 spinal cord injury patient activities of functional independent.

Also, he is eager to give JEE exam, to increase his handwriting speed with hand adaptive device support on a vocational training.

REVIEW OF LITERATURE:

Functional Outcome Following Spinal Cord Injury: A Comparison of Specialized Spinal Cord Injury Center vs General Hospital Short-term Care; Allen W. Heinemann, PhD; Gary M. Yarkony, MD; Elliot J. Roth, MD; Linda Lovell; Byron Hamilton, MD, PhD; Karen Ginsburg, MA; J. Thomas Brown, MD; Paul R. Meyer Jr, MD; Arch Neurol. 1989;46(10):1098-1102.

doi:10.1001/archneur.1989.00520460084017.

MATERIAL & METHODOLOGY:

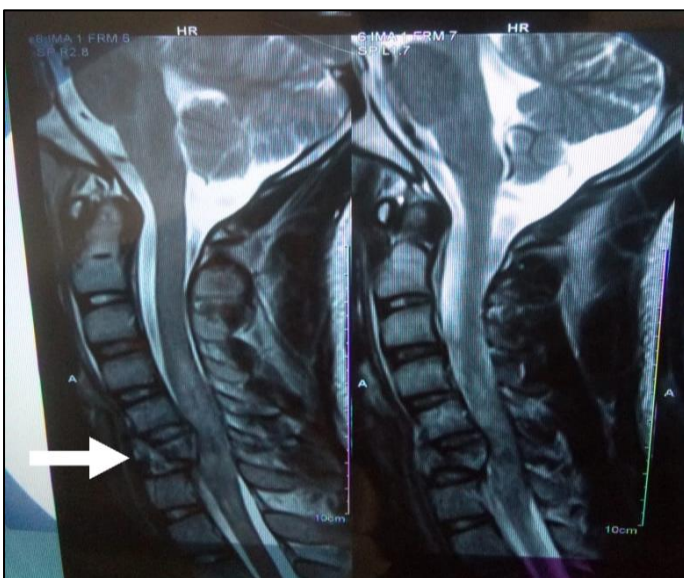


Figure:1 Shows C5 and C6 vertebra fracture



Figure:2 Shows Patient functional training

SINGLE CASE STUDY

Patient is assessed with spinal cord injury measures spinal cord independence measure (SCIM)⁽⁴⁾ and walking index spinal cord injury (WISCI)⁽⁵⁾ pre and post rehabilitation at interval of 1 and half month .The patient is trained in institutional rehabilitation set up with varies training like weight bearing exercise, strengthening exercise , for upper limb and lower limb , core strengthening , positioning , trunk facilitation , wheelchair ambulation ,gait training , functional training , utility training , balancing activities , vocational training , advices. The patient is also motivated to go to community for social life with psychological counselling. patient is not actively participating in community, that's why we have try to some sports & recreation activities like a club throwing and playing musical instrument.

Also for his exam preparation, he is finding it very useful to improve his writing speed through the writing splint (chuck grasp splinting) like a tripod grasp.

INTERVENTION:

Strengthening exercises of U/E and L/E, Trunk strengthening exercises, Bed mobility and activity exercises, Wheelchair ambulation, Wheelchair activity, sitting balance, Back strengthening exercises, sit to stand with assistive device (walker and KAFO) and one person support, After one and half month using AFO, Standing on standing frame and parallel bar, Gait training and ADL activity.⁽⁶⁾

RESULT:

The patient is pre and post rehabilitation on SCIM and WISCI and it shows significant improvements in it the results are as below

ON ADMISSION

AFTER ONE AND HALF MONTH

SCIM:40/100, 53/100

WISCI:0/20, 6/20

He has been sent to participate in para-athletic sports as he has shown such improvement in sports activities. After using hand adaptive devices, he has a try to some better hand writing and increases speed also in vocational training that's why he got a motivated to preparing JEE & board exam. he has appeared JEE exam recently and complete the paper, he can also be motivated other online exam and attending school and tuition regularly. he has gone for club throwing at state level para-athletic sports and national junior para-athletic sports he can also driving practicing with modified vehicles and he also need a transfer training to more independent for life.

CONCLUSION:

The patient with cervical spinal cord injury has chance to live independently with rehabilitation approaches like physiotherapy, vocational training, utility training, functional training and sports training Quadriplegic patient with

multidisciplinary functional rehabilitation approach and vocational & sports training can participate on board exam and para-athletic sports competition. The patient will become productive for the society as well as for the family & nation.

REFERENCE:

1. O.B. Sullivan. "Traumatic Spinal Cord Injury." 14th Edition, Chapter: Traumatic Paraplegia & Quadriplegia.
2. Broomy, Ida. "Traumatic Paraplegia and Quadriplegia." Catz A, Itzkovich M, Agranov E, Ring H, Tami A. "SCIM – A New SCL Disability Scale." Spinal Cord, vol. 35, no. 14, 1997, pp. 850–856.
3. "Patient Data Forms at Jaya Rehabilitation Centre."
4. Catz A, Ltzkovich M, Agranov E, et al. "Spinal Cord Independence Measure (SCIM)." Spinal Cord, vol. 35, 1997, pp. 850-856.
5. Dittuno PL, Dittuno Jr JF Jr. "Walking Index for Spinal Cord Injury (WISCI II) Scale Revision." Spinal Cord, vol. 39, 2001, pp. 654-656.
6. Yarkony, Gary M., et al. "Benefits of Rehabilitation for Traumatic Spinal Cord Injury: Multivariate Analysis in 711 Patients." Arch Neurol, vol. 44, no. 1, 1987, pp. 93-96. doi:10.1001/archneur.1987.00520130071020
7. Catz A, Itzkovich M, Agranov E, Ring H, Tami A. "Traumatic Paraplegia and Quadriplegia." Spinal Cord, vol. 35, 1997, pp. 850-856.
8. O'Sullivan, O.B. "Functional Independence Measure." Spinal Cord, pp. 342-343.
9. Hall, Karyl M., et al. "Characteristics of the Functional Independence Measure in Traumatic Spinal Cord Injury."
10. Scholten, Eline W. M., et al. "Provided Support, Caregiver Burden and Well-being in Partners of Persons with Spinal Cord Injury 5 Years after Discharge from

IJPTRS Vol 3(1) Jan-Feb-Mar 2024 pp15- 18
First Inpatient Rehabilitation."

E-ISSN 2583-4304

11. Dietz, Volker, and Karim Fouad. "Restoration of Sensorimotor Functions after Spinal Cord Injury." Spinal Cord Injury Centre, University Hospital Balgrist, Switzerland, and Faculty of Rehabilitation Medicine, University of Alberta, Canada.
12. Behrman, Andrea L., et al. "Neuroplasticity After Spinal Cord Injury and Training: An Emerging Paradigm Shift in Rehabilitation and Walking Recovery."
13. Barbin, Jean-Marc. "Outcomes of a Skiing Program on the Level of Stability and Self-esteem."
14. Middleton, James W., et al. "Postural Control During Stance in Paraplegia: Effects of Medially Linked Versus Unlinked Knee-Ankle-Foot Orthoses."