

Multiple Disabilities – Challenges in Rehabilitation

Dr Sindhu Vijayakumar, MBBS, MD, DNB, Senior Research Associate

Dr Anil Kumar Gupta, MBBS, Senior Resident

Dr M Moinuddin Araf, MBBS, MD, Consultant*

Dr Diganta Borah, MBBS, MD, DNB (PMR), Senior Resident

Dr Shiv Lal Yadav, MBBS, MD, DNB (PMR), Associate Professor

Dr U Singh, MBBS, DPMR, DNB (PMR), Professor and Head

Dr Sanjay Wadhwa, MBBS, DPMR, DNB (PMR), MNAMS, Professor & Head**

Department of Physical Medicine and Rehabilitation, All India Institute of Medical Sciences, New Delhi, India.

*Department of PMR, Apollo Hospital, Dhaka, Bangladesh

**Department of PMR, PGIMER, Chandigarh

Abstract

Traumatic spinal cord injury patients are likely to have many associated injuries. Amputations if present, narrow the rehabilitation potential of such patients. The picture gets further complicated if the mental status is questionable. A twenty three year old male patient who has been under treatment for paranoid schizophrenia suffered head injury, spinal cord injury and left wrist disarticulation following trauma. He also had left sided forefoot amputation and plantar flexion deformity of left ankle joint. Rehabilitation of this patient has been a challenge and satisfactory results were obtained with considerable modifications of assistive aids and appliances.

Key words: Multiple disability, spinal cord injury, paranoid schizophrenia, head injury, amputation, wheelchair modifications, assistive aids.

Case Report

A twenty three year old unmarried male degree student presented with a history of fall from a slowly moving train (date of injury was 1st July 2003). The nature and mechanism of injury are questionable as the patient was traveling alone. He was right hand dominant.

At the time of injury, he had external injuries on head, left hand and left foot. There was loss of consciousness 15-20 minutes after injury and he remained unconscious for 3 hours, without any bleeding from ear, nose and throat (ENT bleed) and seizures.

After dressing of wounds at a local hospital, patient was taken to the State Medical College Hospital. There, airway was maintained and bladder catheterized. Patient had experienced constipation at that time.

Amputation of left hand through wrist and of left foot through metatarsophalangeal (MTP) joints were done on 3rd July 2003 due either to infection or gangrene of crush injuries of the affected parts.

A week after injury (10th July), patient and relatives noticed weakness of both lower limbs. The family members and the treating doctors focused only on the external injuries and it was difficult to determine whether the weakness was present and that they neglected it or the paraplegia developed later. Thus the onset of lower limb weakness is questionable. Plain radiograph revealed anterior wedge compression of 3rd lumbar vertebra with posterior dislocation. Magnetic Resonance Imaging (MRI) done on the 15th (five days after weakness noticed) confirmed Spinal cord injury (SCI) with anterior compression fracture of L3 vertebra with posterior dislocation (Fig 1).

At admission to rehabilitation ward at AIIMS Hospital (5 months after injury), patient's higher mental functions seemed satisfactory, had weakness of both lower limbs, left sided wrist disarticulation, amputation of all toes of left foot through MTP joints, tightness of both heel cords, was on condom drainage of bladder, had bladder sensations and hesitancy but no voluntary initiation of micturition or continence, and bowel sensations were present but without continence.

In the past this patient was diagnosed to have paranoid

Corresponding author: Dr Sindhu V, Senior Research Associate, Dept. of PMR, AIIMS, Ansari Nagar, New Delhi – 110 029. Email: drsindhu29@yahoo.co.in

Table 1.	
Rehabilitation Problems	Solutions
Paranoid schizophrenia (in remission)	Tablet Olanzapine 10mg at night, psychotherapy No symptoms at discharge, good communication
Head injury	MMSE (Mini Mental Status Examination) did not reveal any cognitive deficit (30/30)
Facial nerve palsy	Recovered
Diplopia (right superior oblique paralysis with squint)	No active ophthalmologic intervention
Left wrist disarticulation	Left sided below elbow type functional prosthesis (body powered) with voluntary opening terminal device
Bilateral tendoachilles tightness	Stretching exercises
Left foot amputation	Filler in left shoe and AFO
Ambulation	Wheelchair with handles on rims (Fig. 4) Walking and standing with left sided axillary crutch with forearm trough, right axillary crutch and bilateral KAFO (Knee Ankle Foot Orthosis) (Fig.5)
Bladder management	Self clean intermittent catheterization with straps for left upper limb (Fig. 6)
ADL	Training in all aspects of ADL
Socio-vocational problems	Complete graduation through distance education Tuition classes for school children for temporary income, wants to own a garment shop Counseling of family members Recreational activities

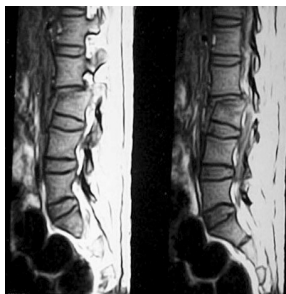


Fig 1. MRI LS Spine

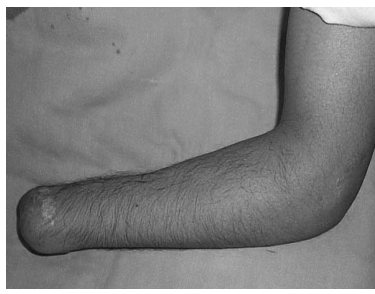


Fig 2. Residual Upper Limb



Fig 3. Residual Left Foot



Fig 4. Wheel Chair with handles on rims



Fig 5. Patient standing with Bilateral HKAO and Crutches



Fig 6. Patient doing CSIC

schizophrenia and was on medication. The duration of psychiatric illness and type of medication could not be elicited. Patient had denied history of psychiatric illness at the beginning of interrogation. He used to consume alcohol once a month, occasionally smoke cigarettes, and used to chew “Khaini” (a mixture of tobacco and lime) 5-6 times a day. He did not suffer from any other significant medical illness in the past.

On examination, the patient had intact higher mental functions though he had vacant look and occasional altered behavior with little interest in communication. There was right sided, lower motor neuron type, of facial nerve (7th cranial nerve) palsy and right sided trochlear nerve (4th cranial nerve) palsy.

There was ‘Knuckle’ kyphosis at L3, without tenderness. He had incomplete, flaccid, traumatic spinal cord injury with paraplegia, ASIA Impairment scale C with scores, motor – 44 / 100; sensory – 94 / 100 (both pinprick and light touch). His neurological level was motor – L1 and sensory – L1. He also had neurogenic dysfunction of bladder and bowel with urinary tract infection (UTI) at time of admission.

There was associated left sided wrist disarticulation (Fig 2) and left foot amputation through MTP joints (Fig 3). Plantar flexion contractures of both ankle joints, more on the left side (Fig 3) than right were present. Functional Independence Measure (FIM) score at admission was 61.

Ultrasonography (USG) of bladder revealed debris. Micturating Cysto Urethrogram (MCU) revealed grade I vesicoureteric reflux (VUR) on left side.

The Rehabilitation goals for this patient at the time of admission were as follows.

- 1 Independence in Activities of Daily Living (ADL) to the maximum possible extent.
- 2 Ambulation – assisted wheelchair ambulation and if possible, independent.
- 3 Management of bladder and bowel dysfunction.
- 4 Psycho-socio-vocational assessment and possible interventions.
- 5 Sexual and marriage counseling.

After detailed history, and thorough clinical examination, relevant investigations were ordered. Appropriate dietary modifications were done. Antibiotics were given according to sensitivity for treatment of UTI. Amitriptyline 25mg was started at night to increase the bladder capacity and the dose was adjusted to the desired effect. Olanzapine was started later after psychiatry consultation for management of the psychiatric condition.

It was difficult to initiate rehabilitation protocol as the patient did not fully cooperate and was not communicating

well. However, with adequate psychiatric intervention, counseling and family support, patient was convinced that he could achieve better independence. Physical and occupational therapy were initiated along with ADL training. Psychological, social and sexual counseling were given. Vocational opportunities were explored and suitable guidance given.

An improvement in neurological status as well as mental status was noted during his hospital stay.

The management details are given in Table 1.

At discharge from our hospital, patient was cheerful, actively participating in the rehabilitation programme and eager to learn more.

The ASIA Impairment Scale was still C, but the scores had improved to motor – 51 and sensory – 94. His FIM Score was 103 (61 at admission).

He was independent in self-care activities of eating, grooming and dressing, needed minimal assistance in bathing and toileting. Though he required minimal assistance with bowel care, had modified independence in bladder management. Mobility activities required supervision. He was completely independent in wheelchair locomotion. He could ambulate to an extent with bilateral KAFO with right sided conventional axillary crutch and left axillary crutch with forearm trough without upper limb prosthesis.

Discussion

In a study of 30 patients with spinal cord lesions and depressive disorders by Fullerton et al, the accident causing the injury seemed related to a psychiatric disorder before injury in 6 patients and to drinking before the accident in 15 patients¹. Liang et al (1996) conducted a retrospective study of clinical features and rehabilitation outcomes in 17 SCI patients with preexisting schizophrenia². They found that fifteen injuries were caused by voluntary fall. Ten incomplete paraplegics were able to ambulate with or without a device. They also reported that psychiatric symptom was one of the main obstacles of rehabilitation. They concluded that rehabilitation programs were found to benefit subjects after their psychiatric problems were under control. In our patient, it was not clear whether the patient had a voluntary fall as he could not recall the events clearly or he would not tell. It is possible that he tried to hurt himself as the train was reportedly moving very slowly. The history of premorbid psychiatric diagnosis also favors this.

Another retrospective review conducted at the National Spinal Injuries Centre, Stoke Mandeville Hospital, UK, examined the cases of 137 individuals with SCI as a result of suicide attempt³. Schizophrenia and depression were evident in 32.8% and 27% of their cases respectively and the cause of injury in 85% was ‘falls’.

Nagler (1950) in his series reported that only 3 patients had psychotic reaction in 500 spinal cord injury (SCI) cases and all had paranoid-type schizophrenia⁴. Hohmann also mentioned 18 cord injured patients with schizophrenia⁵.

Our patient had amputations complicating his physical condition. Ohry et al (1983) found that only six among hundreds of SCI patients had lost one or more upper or lower limbs⁶. They reported that the clinical and psychological effects of absence of limbs are tremendous.

Davidoff et al reported that head injury may frequently be associated with traumatic spinal cord injury⁷. They worked on the fact that a loss of consciousness (LOC) of 20 minutes' duration or a post-traumatic amnesia (PTA) lasting 24 hours has been associated with deficits in concentration, attention, memory and higher-level cognitive function. These may present as significant factors influencing learning and adaptation during and after the formal rehabilitation process.

In accordance with the available literature, it can be said that rehabilitation suffers a great deal due to the psychiatric condition of the patient and takes prime privilege especially in avoidance of self-destructive behavior. Coexisting physical conditions can complicate the rehabilitation of spinal cord injury patients and special care is needed to manage such patients.

Bingham and Beatty conducted a study to determine the rates of access to assistive equipment and medical rehabilitation services among people with disabilities (only working-age adults) in the US⁸. They found that over half the sample (n=500) indicated a need for assistive equipment in the last 12 months. They also found that nearly a third of those who indicated a need did not receive assistive equipment every time it was needed. They concluded that the emphasis in healthcare for people with disabilities should shift from traditional acute healthcare models that focus on functional restoration to preventive services, and maintenance of function, health and

independence. The use of assistive aids could go a long way in achieving functional independence even in patients with multiple disabilities.

One of the main factors requiring special mention that facilitated the rehabilitation of our patient is the active and enthusiastic involvement of the family members side by side with the rehabilitation team members.

Conclusion

Appropriate and timely rehabilitation interventions can bring about gratifying results even in those patients who have multiple disabilities.

References

1. Fullerton DT, Harvey RF, Klein MH and Howell T. Psychiatric disorders in patients with spinal cord injuries. *Arch Gen Psychiatry* 1981, 38 (12): 1369 – 71.
2. Liang HW, Wang YH, Wang TG, Tang FT, Lai JS, Lien IN. Clinical experience in rehabilitation of spinal cord injury associated with schizophrenia. *Arch Phys Med Rehabil* 1996; 77: 283-6.
3. Kennedy P, Rogers B, Speer S and Frankel H. Spinal cord injuries and attempted suicide: a retrospective review. *Spinal Cord* 1999 Dec; 37 (12): 847 – 52.
4. Nagler B. Psychiatric aspects of cord injury. *Am J Psychiatry* 1950; 107: 49-56.
5. Hohmann GW. Psychological aspects of treatment and rehabilitation of the spinal cord injured person. *Clin Orthop* 1975; 112: 81-8.
6. Ohry A, Heim M, Steinbach TV, Rozin R. The needs and unique problems facing spinal cord injured persons after limb amputation. *Paraplegia* 1983 Aug; 21 (4): 260-3.
7. Davidoff G, Morris J, Roth E, Bleiberg J. Closed head injury in spinal cord injured patients: retrospective study of loss of consciousness and post-traumatic amnesia. *Arch Phys Med Rehabil* 1985 Jan; 66 (1): 41-3.
8. Bingham SC, Beatty PW. Rates of access to assistive equipment and medical rehabilitation services among people with disabilities. *Disabil Rehabil* 2003 May; 25 (9): 487 – 90.