

# Diffuse Axonal Injury Surviving Against All Odds - A Case Study

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**Abstract:** *Diffuse axonal injury is a severe form of debilitating illness which usually has a very long course of recovery, however with proper care and patience patient may improve fast as happened in this case.*

**Keywords:** diffuse axonal injury, trauma, head injury, debilitating illness, long course of recovery, coordinated approach, morbidity and mortality, patience

## 1. Introduction

Diffuse axonal injury (DAI) is a traumatic brain injury that results from a blunt injury to the brain (1). Traumatic brain injury is classified as mild, moderate and severe based on Glasgow Coma Scale (GCS).

Mild Traumatic Brain Injury= GCS 13 - 15

Moderate Traumatic Brain Injury= GCS 9 - 12

Severe Traumatic Brain Injury= GCS <8

DAI primarily affects the white matter tracts within the brain. Clinically patients with DAI show a spectrum of neurological dysfunction ranging from clinically insignificant to comatose state.

DAI usually occurs after a high speed motor vehicle accident where accelerative and decelerative motion causes shearing force to white matter tracts of the brain (2). Thus occurs microscopic and gross damage to the axons of the brain at junction of gray and white matter.

Typically DAI is considered in patients with GCS <8 for over 6 hours. Patients with severe DAI may remain in a persistent vegetative state. A few of those patients may regain consciousness in the first year after the injury (3).

However definitive diagnosis of DAI can be made in postmortem pathological examination of brain tissue. Clinically, diagnosis is made on the basis of clinical information and radiological findings. CT brain has low yield in detecting DAI related injuries. MRI brain is modality of choice.

Studies suggest that once brain cells are destroyed or damaged they usually do not regenerate. However recovery after brain injury can take place especially in younger people as other areas of brain make up for the injured tissue. The period of recovery cannot be predicted at time of injury and may take months to years. Recovery involves a prolonged or lifelong process of treatment and rehabilitation.

## 2. Case History

A 24 year old male patient presented to trauma ward with head injury following road traffic accident on 17/12/2019 in an unconscious state not responding even to a deep painful stimulus. He had GCS of 3/15 with both pupils constricted non reactive to light with Spo2 70% on air. However his pulse and BP were normal. There was no any serious

external mark of injury. Patient was immediately intubated and CT brain done s/o minimal subarachnoid hemorrhage in occipital region. Patient was tracheostomised after a week and since recovery was slow based on extent of Hemorrhage so brain MRI was done which was suggestive of diffuse axonal injury. Symptomatic treatment was continued as earlier and slowly patient started responding to stimuli and pupils started reacting to light and after a month of efforts and care (21/01/2020), mechanical ventilation was removed and on (26/01/2020) tracheostomy tube was removed and patient started following all commands. The patient was shifted to ward and he started walking and talking and was discharged with GCS 15/15 on 03/02/2020.

## 3. Discussion

The patients with Diffuse Axonal Injury have variable presentation from clinically insignificant presentation to permanent vegetative state. The patient may need long term intubation and mechanical ventilation. The patient needs aggressive care and management till patient regains full consciousness. The patient may require Ryles tube feeding and IV antibiotics prophylactically and aggressive physiotherapy to prevent disuse atrophy. It requires coordinated team efforts from anesthesia, ENT, critical care, neurosurgery, physiotherapy, pulmonology and nursing staff for patient care and management. The patient with DAI not only suffers physically but also mentally, emotionally, socially, financially, professionally and so his family. It requires patience and dedication.

## 4. Conclusion

Though recovery rates in case of DAI are very slow and may require lifelong rehabilitation. Patient sometimes improves fast. As in this case, patient's relative were even asked for organ donation of the patient but they refused and results were exceptional, the patient improved and within the period of 50 days the patient walked home on his own and thanked the doctors and staff.

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