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CASE STUDY
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Phineas of Punjab: A Young Contused Brain

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Abstract

Traumatic brain injury (TBI) can be defined as the disruption in brain function, or other evidence of brain pathology, caused by an external physical force. Its neuropsychiatric manifestations include a myriad of cognitive deficits, affective changes, apathy, psychosis and behavioral dyscontrol disorders. The case study aimed to discuss an interesting case of a young male had a deviation from his normalcy following head injury during an road traffic accident, under influence of alcohol. He was referred by his treating surgeon for evaluation of alcohol use, however, he had subtle behavioural changes in form of impulsivity, anger outbursts, perseverance and crying spells, a stark deviation from his pre-morbid self. Evaluation and identification of neuro-psychiatric consequences of traumatic brain injury requires a high suspicion, close monitoring, longitudinal follow ups along with pharmacotherapy, socio-occupational supportive measures and an empathetic-holistic approach.

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Introduction

Phineas P. Gage (1823–1860) was an American railroad construction foreman who survived an accident where an iron rod was driven completely through his head, destroying his left frontal lobe, which eventually had profound effects on his personality and behaviour over the remaining twelve years of his life[†], making him "no longer Gage". Famously known as the "American Crowbar Case,"[†] it is one of the first documented cases suggesting the role of the brain in determining personality, and that damage to specific parts of the brain induces specific behavioural changes. [1]

A traumatic brain injury (TBI) [2] refers to a brain injury caused by an external force such as a forceful bump, blow, or jolt to the head or body, or from an object penetrating the brain. In some cases, the presenting problems are temporary or short-lasting with brain dysfunction, including problems with a person's cognition, emotions, behaviours and motor functions. Severe TBI often leads to profound and permanent disability, sometimes even death. [2]

Some injuries are considered primary, where the damage is immediate due to contact or inertial forces. (Acceleration, deceleration, rotation). In secondary TBI, damage evolves gradually over the course of hours, days, or weeks after injury. These secondary brain injuries are the result of reactive inflammatory

processes that occur after the initial head trauma. They can also be classified as penetrating (open) and non-penetrating (closed) TBI. [2] TBI often presents with a pleomorphic clinical presentation which includes physical symptoms (headache, convulsions, blurred vision, nausea/vomiting), neurological issues, etc), cognitive/behavioural symptoms (loss/change in consciousness, altered orientation, confusion, memory impairments, affective symptoms, deranged bio-drives, etc) and other systemic and sensory symptoms such as light-headedness, dizziness, vertigo, hearing problems, unexplained bad taste in the mouth, photophobia, fatigue or drowsiness, etc.

Organic Personality Disorder is a condition characterized by a significant change in personality and behaviours, due to an underlying TBI or another pathophysiological medical condition affecting the brain.[3]

Case Report

A 26-year-old Hindu male, the youngest of three siblings, hailing from a nuclear family of rural Punjab, educated till 12th standard, married for six years, had one three-year-old son and premorbid anxious and avoidant personality traits, presented to the emergency department of a tertiary care hospital following a road traffic accident with head trauma, under the influence of alcohol. During hospitalization in the Surgery ward, he was irritable and intermittently uncooperative. On day two of hospitalization, he was referred for Psychiatric evaluation on a consultation-liaison (CL) basis for alcohol use. Interviews with him and his wife did not reveal any history suggestive of a dependant pattern of alcohol use or withdrawal discomfort. Both refused consent for admission to the Psychiatry ward, so he was planned to be managed on a CL basis in the Surgical ward. Wife further described him to be a cheerful person, who had an active & outgoing social profile and managed stress in an adaptive and mature manner. In the Surgical ward, he continued to be irritable, pacing around, struggling with self-care, refusing meals, having disturbed sleep, with occasional crying spells. After one week of hospitalization, during visiting hours, he indulged in an inappropriate, profane behaviour with his wife, in front of other patients and their families and an anger outburst towards his playful son, which was a gross deviation from his usual self. Thereafter, he was found to be overtalkative, repetitive and fidgety. Following the incident, the *now scared* wife re-visited the Psychiatrist and requested his management, stating that he is "*not my husband anymore",* precipitating his transfer to the Psychiatry ward as admission with high support needs as per section 89 of the Mental Health Care Act (MHCA), 2017.[4]

Mental status examination revealed an ill-kempt, uncooperative, fidgety, occasionally tearful, aggressive person with low tone, repetitive, but high rate and volume of speech. His affect fluctuated from being blunted to irritable to perplexed. He had an increased stream of thoughts, in the absence of delusions or perceptual abnormality. He had impaired personal and social judgement with intact memory, cognition and orientation.

Lab Investigations revealed normal Liver function tests (LFT), gamma-glutamyl transferase (GGT), mean corpuscular volume (MCV) and Ultrasonography of the abdomen. The Alcohol Use Disorders Identification Test (AUDIT) score was 7/40. [5] (rules out problematic alcohol use disorder) Montreal Cognitive Assessment (MOCA) revealed a score of 27/30, objectively suggestive of intact cognition. [6] On the Brief Psychiatric Rating Scale (BPRS) [7], he scored 46/126, suggestive of mild deviation from normalcy.

Serial non-contrast computed tomography (NCCT) was done. On the day of admission, it revealed bilateral frontal and left temporal haemorrhagic contusions. (Figure 1) On day two, following a head injury, NCCT revealed increased peri-lesional oedema. (Figure 2) After one month of trauma, NCCT showed prominent encephalomalacia with gliosis and a prominent temporal horn of the right lateral ventricle. (Figure 3)

A diagnosis of Organic Personality Disorder (ICD10 F07.0), now subsumed under the broader category of Personality change due to another medical condition (6E68) in ICD-11, [3,9] was made and Tablet Divalproate Sodium 750 mg in divided doses was started. He was also given the benefits of eclectic psychotherapy with components of supportive, behavioural and family psychotherapy along with

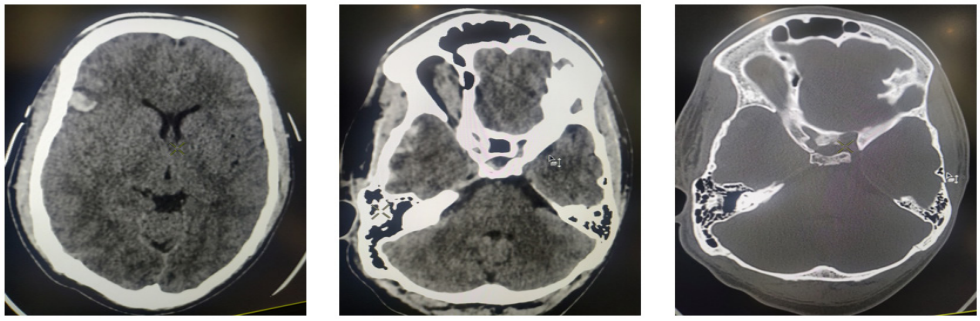

Figure 1: CT scan (Head) at Day 0: Right fronto-temporal contusion

psychoeducation. After nine weeks of intensive inpatient management, he was discharged with a follow-up plan of monthly review at the outpatient department, with a goal of treatment rationalization and vocational rehabilitation.

With regular follow-ups, treatment compliance and adequate social support, he continued to have clinical as well as socio-occupational improvement. During the last follow-up, he reported occasional dull aching headache after a perceived stressful and hectic day at his job, which would subside with Tab Paracetamol (500 mg) and rest. He is planned for a regular follow-up with maintenance medications, followed by gradual tapering and a period of drug-free observation.

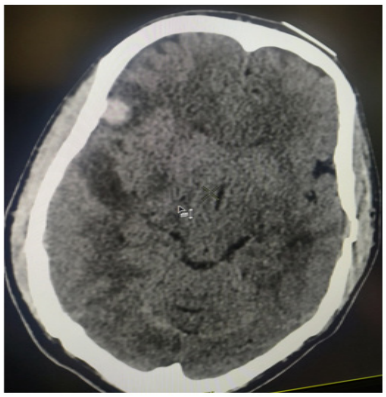

Figure 2: CT scan (Head) at Day 5: Increased peri-lesional oedema

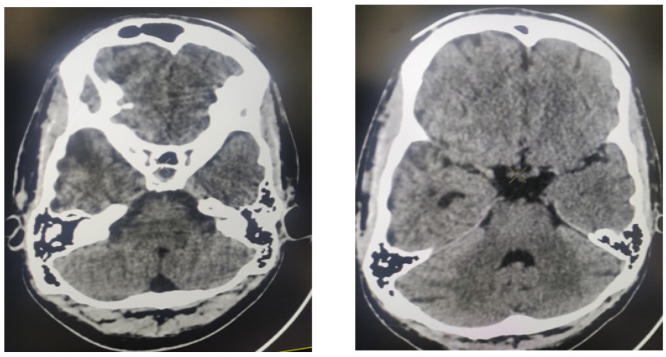

Figure 3: CT scan (Head) at Day 60: Encephalomalacia with gliosis, Prominent temporal horn of right lateral ven-

Discussion

Diagnostic and Statistical Manual of Mental Disorders (DSM) 5 defines TBI as brain trauma along with at least one of the features of loss of consciousness, post-traumatic amnesia, disorientation/confusion or neurological signs such as a new onset of seizure/worsening of pre-existing seizure disorder, visual field defects, anosmia, hemiparesis, or positive neuro-imaging.[8] In ICD-11, Personality change due to another medical condition is characterized by a persistent disturbance in personality that represents a marked deviation from the individual's premorbid functioning. This disturbance arises as a direct consequence of a medical condition affecting the brain, such as traumatic brain injury, epilepsy, cerebrovascular disease, or neurodegenerative disorders. The presentation includes reduced capacity for persistence in goal-directed activity and difficulty in sustaining efforts that require delayed gratification, emotional dysregulation, with lability, irritability, or inappropriate affect, impulsivity and disinhibition, cognitive changes, and alterations in communication or behaviour, including changes in speech production or socially inappropriate sexual behaviours. These features represent a consistent and enduring change from the person's premorbid personality pattern and cannot be better explained by another mental, behavioural, or neurodevelopmental disorder. [9]

Neuropsychiatric syndromes are common after TBI, often underdiagnosed and have pleomorphic

presentations, causing a significant increase in distress, disability, and health care utilization. Most common psychiatric syndromes associated with TBI include Cognitive impairment, dementia, personality changes, affective disorders, psychosis, anxiety disorders, substance use disorder and post-concussion syndrome. [10]

A holistic and empathetic approach with high suspicion, close monitoring, longitudinal follow-up plans, rationalized pharmacotherapy, along with adequate socio-occupational supportive measures with focus on the biological, psychological and social profile of the individual with Psychiatric disorders is a must. Such cases often require a multi-disciplinary approach and long-term systematic monitoring.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of Interest

There are no conflicts of interest.

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