

Dysexecution and Personality Changes in Frontal Lobe Syndrome: A Case Report from a Rural Tertiary Care Center

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Abstract: *This case report presents a 33 - year - old man who experienced head trauma resulting in frontal lobe syndrome, a condition characterized by persistent personality changes and behavioral abnormalities. Clinical manifestations include apathetic behavior, recurring violent episodes, poor social judgment, affective instability, aggression, avolition, and reasoning difficulties. Diagnostic evaluation involved comprehensive assessments, including patient history, mental state examination, neurological assessment, brain imaging, and neuropsychological evaluations focusing on frontal lobe function. Symptoms remained consistent over six months, highlighting their chronic nature. The case underscores the challenge of diagnosing frontal lobe syndrome, often overlooked or misdiagnosed due to its rarity and the complex role of frontal lobes in behavior. Brain imaging findings aligned with clinical presentation, supporting the diagnosis. This report emphasizes the importance of a multidimensional diagnostic approach for accurate identification and management of frontal lobe syndrome.*

Keywords: Frontal lobe syndrome, head trauma, personality change

1. Introduction

The frontal lobes, which are traditionally thought to be unique to humans, process a range of higher order functions. Planning, judgment, sequencing, programming, and abstract thought are all attributed to the prefrontal cortex, while motor inhibition, social inhibition, and personality traits are associated with the mediofrontal and orbitofrontal cortex. Damage to the brain's higher functioning systems, including motivation, planning, social conduct, language and speech production is referred to as frontal lobe syndrome (FLS). It is characterized by a shift in the behavior and personality of a formerly normal person. A tumor, head trauma, or illness may be the cause.¹ However, numerous cases have demonstrated the profound behavioral and personality changes brought on by frontal lobe damage as a result of the growing use of neurosurgery and procedures like lobotomy and leucotomy for the treatment of psychiatric problems. Harlow coined the term "frontal lobe syndrome" to refer to this group of symptoms following his studies on the well - known Phineas Gage, whose trauma caused a marked behavioral shift. Therefore, a frontal lobe impairment has the potential to significantly alter not only cognition but also personality and goal - directed behavior.^{2,3}

2. Case Description

2.1 Case History

A 33 - year - old man was brought to the Psychiatry OPD with complaints of irritability, anger outbursts, excessive talking, overfamiliarity, impulsive behavior, and

inappropriate social behavior for 5 months. The patient was apparently alright 6 months back when he met with a road traffic accident and a sustained head injury, NCCT head found multifocal hemorrhagic contusions in bilateral basifrontal, frontal and left temporal regions with extra - axial hematoma of 5mm thickness seen in bilateral frontal region. (Figure 1) He lost consciousness for 6 days, after which bifrontal craniotomy with right frontal lobectomy with removal of left frontal contusion with left frontal duraplasty was performed under general anesthesia. (Figure 2) Later, he developed aforementioned symptoms. He would not sit still for any task and often leave conversations midway. He was prescribed: tablet olanzapine 15mg HS and valproate 500 mg BD. The treatment was partially effective in treating his mood and behavioral changes. There was no significant past medical and psychiatric history, family history of any psychiatric illness, and history of substance use.

2.2 Case Examination

His general physical and systemic examinations were within normal limits. On nervous system examination, all cranial nerves were found to be normal, muscle power was decreased on the left upper and lower limbs (4/5), executive functions: complex and directed attention was impaired. On the Frontal Assessment Battery patient score was: 7/18 (normal score of 12) which included similarities score: 2/3, lexical fluency score: 1/3, motor luria test score: 1/3, conflicting instructions score: 0/3, Go - No - Go test score: 1/3, prehension behaviour score: 2/3. Wisconsin card sorting test and Stroop test were both abnormal.

Mental status examination revealed overfamiliarity and disinhibited behavior. Speech was non-spontaneous with increased rate, relevant with increased reaction time. His mood was irritable and labile. Delusions/ obsessions/ suicidal ideas were absent.

From the above history, examinations, tests and MSE, we concluded that the patient had loss of executive functions along with disinhibition and marked personality changes which are seen in frontal lobe syndrome (dysexecutive syndrome).

3. Discussion

Frontal lobe abnormalities can be caused by a variety of illnesses, including neurodegenerative diseases, cerebrovascular illnesses, tumors compressing the frontal lobe, and severe head trauma. HIV, multiple sclerosis, epilepsy with frontal lobe foci, and early-onset dementia are additional factors. These can result in damage to the orbitofrontal cortex which is known to induce "frontal lobe personality," that is characterized by severe behavioral changes, including impulsivity and impaired judgment. Recent research indicates that frontal lobe syndrome may not have received enough attention due to neurodegenerative factors. There were at least 12,000 Frontotemporal lobar degeneration patients in Japan, according to a prior study, suggesting that the illness is more common than first believed.⁴In our case personality changes transcended after RTA, and no cortical atrophy or ventricular dilatation seen on CT-Scan which differentiates it from Frontotemporal dementia and other early onset dementias. The fact that impulsive behaviors happen in the absence of stressors, do not go away with episodes, and eventually become constant sets it apart from impulse control disorders.⁵

Apathetic and abulic states may result from dorsolateral lesions. Ventromedial orbitofrontal lesions, on the other hand, result in impulsive, uncontrolled behavior and potentially hazardous choices. Bilateral lesions typically result in more severe impairments. A differentiation between left and right frontal lesions has been made. Lesions on the left side are linked to symptoms of depression, while lesions on the right side are linked to manic symptoms. Nonetheless, there are a range of behaviors associated with frontal lobe syndrome that defy clear-cut guidelines.⁶

Previous study has examined the relationship between DLPFC lesions and "pseudo-depressive" syndrome, which is characterized by behavioral slowness (abulia), decreased motivation, loss of initiative, and verbal output reduction.⁷

An emerging field of study in the dorsolateral frontal cortices is "intuition." The limbic system and association cortex can exchange information with the frontal lobes which facilitates abstract decision-making, which quickly produces more effective or "intuitive" decisions.⁸ Intuitions and decision making was found to be poor in our patients.

Our case study illustrates how a patient with traumatic brain injury resulting in frontal lobe damage had a significant shift in behavior and personality. After RTA, he was unable to

operate normally and frequently exhibited uncontrollable episodes of unwarranted violence at home as it is thought of as our personality's home and the center that regulates our emotions and conduct.

The underlying etiology determines the prognosis of frontal lobe syndrome. In contrast to progressive neurodegenerative conditions like frontotemporal dementia, the prognosis is better for causes that may be treated, such as infections or resectable tumors.

4. Conclusion

Damage to the frontal lobes can have disastrous effects on both the sufferer and their loved ones. Although the prognosis is bleak for these people, psychotropic drugs can be utilized to regulate the behavioral disorder to some extent, and rehabilitation could be helpful as a support system.

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Figure Legends:

Figure 1: Pre-operative NCCT scan showing multifocal hemorrhagic contusions in bilateral basifrontal, frontal and left temporal region with mild perilesional edema. Extra-axial hematoma measuring 5mm in thickness in bilateral basifrontal region.

Figure 2: Post-operative NCCT scan showing gliotic hypodensity in bilateral basifrontal, frontal region and left temporal lobe.

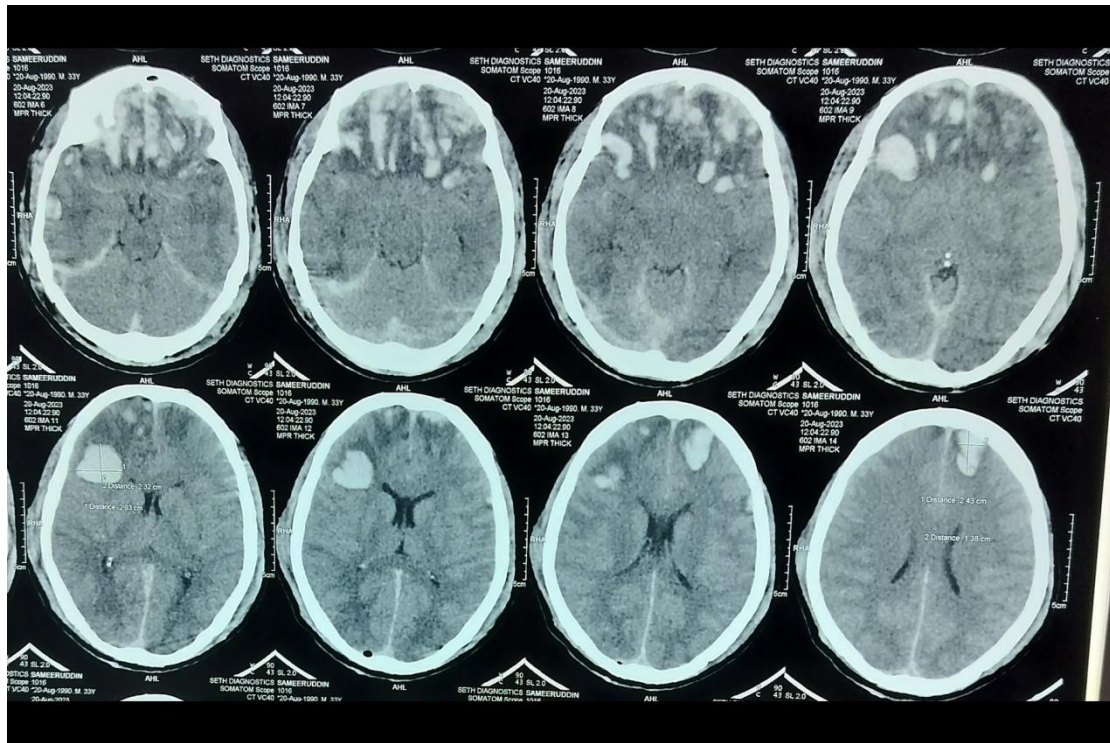


Figure 1

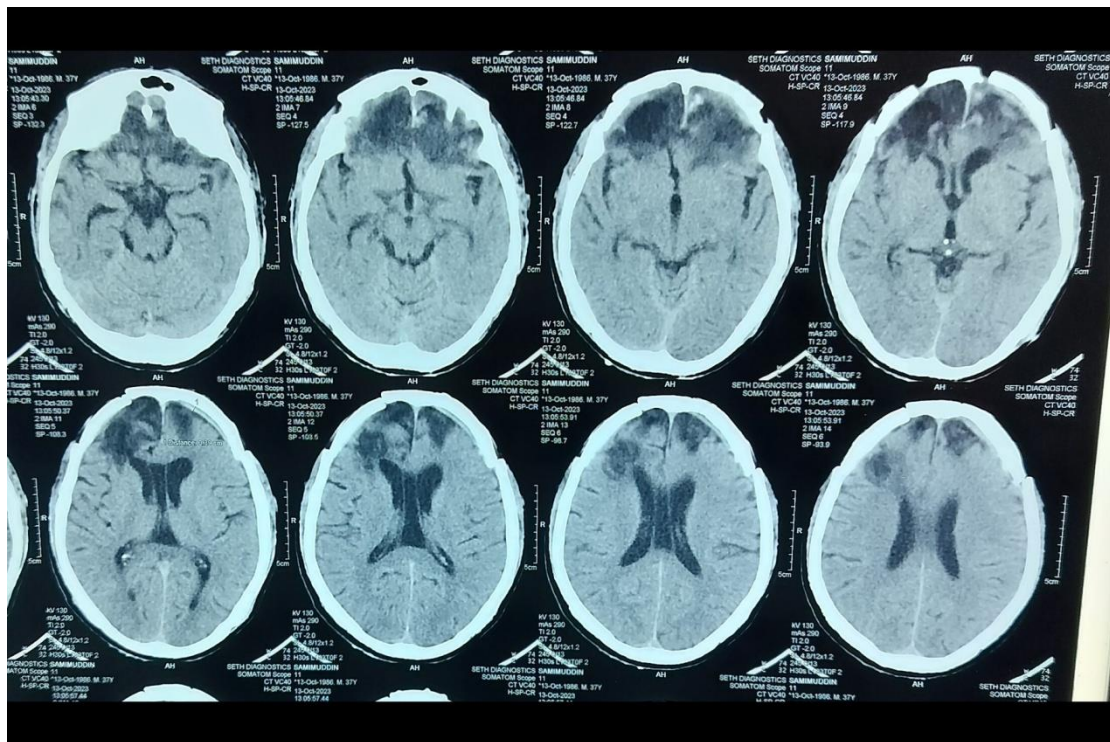


Figure 2