

Recurrent bilateral frontal lobe lesion with maladaptive schema modes and post-traumatic stress disorder symptoms: a case study

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Abstract

The frontal lobe is responsible for high-order functioning, such as memory, attention, decision-making, and personality. Lesions in the frontal lobe may lead to different physical and psychological problems. The current study was conducted to examine the emotional, cognitive, and behavioural states and coping strategies of a patient with recurrent bilateral frontal lobe lesion. It also attempted to determine post-traumatic stress disorder (PTSD) symptoms in a patient. This study described the case of an adult with recurrent bilateral frontal lobe tumour. It covered the clinical presentation, administration of Urdu translation of the Schema Mode Inventory (SMI) and Clinician-Administered PTSD Scale for DSM-5 (CAPS-5), and analysis of the case. The results of the study showed that the recurrent bilateral frontal lobe brain tumour patient engaged in child mode and had a dysfunctional coping style and a maladaptive punitive parent mode. Furthermore, the patient also had moderate PTSD symptoms.

Keywords: Maladaptive Schema Modes, PTSD, Frontal Lobe, Lesion.

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Introduction

The frontal lobe is one of the most developed and largest lobes of the brain and lies next to the central sulcus. Lesions in the brain affect an individual's physical and psychological health, particularly when they are in the frontal lobe. The frontal lobe controls executive functioning like memory, schema, attention, decision-making, speech production, social behaviour, and personality.¹ It is one of the most advanced parts of the brain and is divided into three areas: premotor, pre-central, and prefrontal.² Damage and injury to the frontal lobe is due to the location of the frontal skull and the size of the tumour. Frontal lobe is the region that is most frequently damaged and sensitive to ethanol effects

compared to other parts of the brain.³ Schema is related to our cognition and thought processes and is imposed on reality or experiences, which helps to guide and explain an individual's behaviour and responses. Schema modes are a core concept of schema focus therapy and consist of a collection of thoughts, behaviours, and responses.⁴ Schema modes are self-perpetuating and extremely difficult for an individual to change. Individuals adjust their schema modes according to their situations. They are grouped into four main categories including: healthy modes, dysfunctional child modes, dysfunctional parental modes, and dysfunctional coping modes which are further sub-grouped into 14 categories. According to a study, the frontal lobe is involved in different functions, such as memory, decision-making, language, and impulse control.⁵ The current study reported an individual with a brain tumour in the frontal lobe. The purpose of the case report was to investigate the schema modes and coping styles along with PTSD symptoms in patients with frontal lobe lesion.

Case Report

A 42-year-old man was brought to the neurosurgery

Table-1: SMI of 42-year-old male patient with recurrent bilateral frontal lobe lesion (meningioma).

SMI	Case Report	Healthy means	Discrepancy
VC	3.5*	1.47	2.03
AC	4.3*	1.81	2.47
EC	2.7*	1.20	1.5
IC	3.1*	2.15	0.95
UC	3.3*	2.27	1.03
HC	4.5*	4.52	0.03
CS	2.1(ns)	2.51	-0.41
DPT	2.9*	1.59	1.31
DSS	2.2*	1.93	0.27
BA	4.6*	1.72	2.88
SA	2.5(ns)	2.31	1.09
PP	3.8*	1.47	2.33
DP	2.7(ns)	3.06	-0.36
HA	4.9*	4.60	0.3

*Shows significant, ns= not significant Note: VC=Vulnerable Child, AC=Angry Child, EC=Enraged Child, UC= Undisciplined Child, IC=Impulsive Child, HC=Happy Child, DP=Detached Protector, CS=Complaint Surrenders=Self Aggrandizer, DSS=Detached Self-Soother, BA=Bully and Attack, DP=Demanding Parent, PP=Punitive Parent, HA=Healthy Adult.

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Table-2: Summary sheet of PTSD symptoms of the patient with recurrent Bilateral Frontal lobe lesion on CAPS-5.

Criterion "B" Intrusive Symptoms	Past month	
Symptoms (1 for diagnose	Sev	Sx (Sev $\geq$ 2) 0= No, 1=Yes
1) Intrusive memories B1	2	1
2) Distressing dreams B2	1	0
3) Dissociative reaction B3	0	0
4) Psychological distress B4	1	0
5) Physical reactions B5	2	1
B total	6	# B Sx= 2
Criterion "C" Intrusive Symptoms	Past month	
Symptoms (1 for diagnose)	Sev	Sx (Sev $\geq$ 2) 0= No, 1=Yes
6) Avoidance feeling and memories C1	3	1
7) Avoidance of external reminder C2	1	0
C total	4	# C Sx= 1
Criterion "D" Intrusive Symptoms	Past month	
Symptoms (2 for diagnose	Sev	Sx (Sev $\geq$ 2) 0= No, 1=Yes
8) Unable to recall important aspect D1	3	1
9) Exaggeration of negative belief D2	2	1
10) Distortion of cognition leading blame D3	1	0
11) Negative emotional state D4	2	1
12) Diminished Interest D5	0	0
13) Detachment from others D6	2	1
14) Lack of positive emotion D7	1	0
D total	11	# D Sx= 4
Criterion "E" Intrusive Symptoms	Past month	
Symptoms (2 for diagnose	Sev	Sx (Sev $\geq$ 2) 0= No, 1=Yes
15) Angry and irritable behaviour E1	3	1
16) Self-destructive behaviour E2	2	1
17) Hypervigilance E3	1	0
18) Exaggerated startle Responses E4	0	0
19) Concentration problems E5	3	1
20) Sleep disturbance E6	3	1
E total	12	# E Sx= 4
PTSD Totals	Past month	
Total	Total Sev	Total # Sx
Sum of Sub Totals (B+C+D+E)	6+4+11+12=33	2+1+4+4=11
F duration of disturbance	Current	
22) Duration of disturbance ? 01 month	1=Yes	
Impairment or distress (1 for diagnose)	Past month	
Criterion	Sev	Cx (Sev $\geq$ 2) 0= No, 1=Yes
23) Subjective distress	01	0
24) Social impairment	02	1
25) Occupational functional impairment	02	1
G total	05	# G Cx= 2
Global rating		
26) Global Validity	Good	
27) Global Severity	Moderate	
28) Global Improvement	No	
Dissociative symptoms (1 for Sub-types)	Past month	
Symptoms	Sev	Cx (Sev $\geq$ 2) 0= No, 1=Yes
29) Depersonalisation		0
30) Derealisation		0
Dissociative sub total		# Diss Sx= 0
PTSD Diagnosis	Past month	
Present all criteria (B-G)	1=Yes	
With dissociative symptoms	0= No	
21(Delay onset $\geq$ months	0= No	

Note: Sev=Severity, Sx=Symptoms numbers of time, Diss=Dissociative, CAPS-5 severity score 0-10 few symptoms, 11-22 mild PTSD, 23-34 moderate PTSD, 35-46 severe PTSD, above 46 Extreme PTSD.

department at the Pakistan Institute of Medical Sciences, Islamabad, in April 2019 with complaints of severe headache, dizziness, vomiting, irrational behaviour and talk, body tremors, insomnia, lack of appetite, and consistent sadness, accompanied by fits and loss of consciousness for the past month. He had no family history of psychiatric illness, no major physical trauma, and no history of any medical conditions or alcohol or substance abuse. The patient's history revealed that he had had a frontal lobe lesion in the right hemisphere, which was operated upon successfully in March 2016, after which the patient was referred to another hospital for chemotherapy. However, he did not adhere to the procedure for chemotherapy. After three sessions of chemotherapy, he discontinued the treatment. After three years, he returned to the hospital with the above complaints. He had lost all his previous treatment documents, and was re-admitted to the hospital's neurosurgery ward. Physical and neurological examinations showed some abnormalities, and the physician advised all related investigations. Biochemistry, and haematology results were within the normal range. An MRI revealed a well-defined extradural axial mass dense lesion in the right hemisphere that also involved part of the left frontal lobe. The thick mass in both the right and left frontal lobes was determined to be most likely a meningioma. The patients' caregivers were counselled about the treatment, prognoses, and future complications. Surgical excision was essential, and radiation therapy was advised after surgery. Routine follow-up (once a month for one year) was also advised. History was taken a week before the surgery. The intention of the current study was to examine the PTSD symptoms, emotional, and cognitive conditions, and coping strategies of a patient with a history of a recurrent bilateral frontal lobe lesion. A psychometric Schema Mode Inventory (SMI) was administered to assess the cognitive, emotional, and behavioural, and coping style, whereas Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) was used to measure the PTSD symptoms of the patient.^{6,7} These scales were used for clinical and educational purposes and had good internal consistency Cronbach's range 0.76-0.96, and mean score of 0.86. Furthermore, CAPS-5 is a semi structured interview, which measures the essential features of PTSD, and five point symptom severity scale labelled from "0-4".⁸ Before starting the test, the patient was instructed to read all the items carefully and then respond to each question. The patient was also instructed not to leave any items blank. Before giving the questions, the patient was informed and ensured that his data would be kept confidential and used only

for academic purposes. After a proper informed consent was secured from the patient, a short Urdu version of the SMI was administered. Furthermore, a written consent was also secured from the patient for publishing the paper; permission was also taken from Institutional Review Board (IRB). The results of the current study showed that a patient with a bilateral frontal lobe lesion engaged more in child modes, maladaptive coping style, and maladaptive punitive parent as shown in Table-1.

The characteristics of child modes include, intense anger, harm to people and objects, like an uncontrollable child. In addition, child modes may also have characteristics such as strong feelings of aggression and an inability to show responsibility, lack of autonomous development, and feelings of helplessness. Furthermore, a patient with a history of bilateral frontal lobe lesions may also engage in dysfunctional coping styles as shown in Table-1. These maladaptive coping styles consist of avoidance, surrender, and overcompensation. The features of maladaptive coping strategies include being emotionally and psychologically withdrawn from pain. Patients with bilateral frontal lobe lesions engage in maladaptive coping style like emotional shut-off and behaviour that include gambling, risky sports events, immoral sexual activities, and drug abuse. Another dysfunctional coping style is overcompensation, which includes bullying and attacking and self-aggrandising. The person with frontal lobe lesion engages in bullying and attack activities, such as openly damaging and hurting people socially, verbally, and sexually, and engaging in antisocial activities. In addition, results in Table-1 revealed that a patient with bilateral frontal lobe lesion may also engage in maladaptive punitive parent modes including demanding and punitive parents. These are the negative learned thoughts about oneself and others. These thoughts may be based on fear (demanding) or it can be nasty thoughts (punitive). Moreover, healthy adult mode performs perfect functioning, such as problem solving, appropriate working, social responsibility, maintaining relationship, taking part in sporting and social activities. Results in Table-1 showed that bilateral frontal lobe brain lesion patients lack such qualities. The current study showed that a patient of recurrent bilateral frontal lobe lesion with no current history of trauma had moderate PTSD symptoms as described in Table-2.

The sum of total score on CAPS-5 is 33 which is moderate PTSD symptoms.

Discussion

Several studies have shown the association between brain lesions and psychological symptoms. One study

revealed that tumours on the dorsolateral region of the brain cause difficulty in planning, and organisation. Lesions on the orbito-frontal side lead to disinhibition, while tumours on the medial frontal area might be responsible for apathy and abulia. The schema and belief changes and depressive symptoms occur when the tumour exists in the frontal lobe particularly in the diencephalic region.^{9,10} A study provided support to the result of the present study, that PTSD symptoms were more severe in men without criterion A1, than A1 events, whereas the severity of PTSD symptoms were the same in women after non-A1 and A2 events.¹¹ Treatment and diagnosis of patients with brain tumours specifically on the frontal lobe are challenging tasks for the physicians and neuropsychologists. Clinical and physical examinations and neuro imaging such as MRI and CT scan play an important role in the diagnosis and psychological assessment along with intervention can also boost the recovery of such patients.

Conclusion

The present study showed that patient with a history of recurrent bilateral frontal lobe lesions engaged in maladaptive schema modes, and maladaptive coping strategies. He lacked healthy schema modes qualities, such as maintaining relationship, sporting social responsibilities, and social activities. These findings may help psychologists, psychiatrists, neuro-physicians, care givers, and close family members in the treatment, and care of the individual. The study also provided literature

support in the field of neuropsychology and psychiatry and help psychologists in schema focus.

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