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Case Report

Anaesthesia Section

Postoperative Catatonia with Delayed Emergence in a Cochlear Implant Recipient: A Case Report

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ABSTRACT

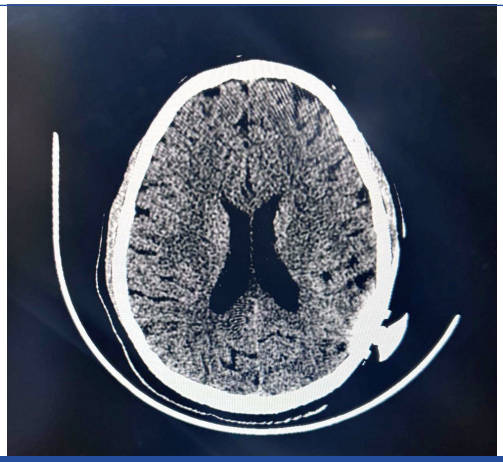
Catatonia is a neuropsychiatric syndrome marked by motor, behavioural, and autonomic abnormalities and is now recognised as a trans-diagnostic entity that can be overlooked in perioperative care because it may mimic delayed emergence from anaesthesia or other postoperative complications. This case report aimed to increase clinical vigilance for postoperative catatonia after cochlear implantation in an adolescent, emphasising diagnostic differentiation when routine organic evaluations are unrevealing. A 15-year-old girl (Body Mass Index [BMI] 28.4 kg/m²; American Society of Anaesthesiologists [ASA] II) underwent elective left cochlear implantation under general anaesthesia with propofol, fentanyl, atracurium, sevoflurane (Minimum Alveolar Concentration [MAC] 0.9-1.0), and intraoperative dexmedetomidine infusion; reversal was achieved with neostigmine and glycopyrrolate. Postoperatively, she maintained spontaneous respiration and stable vital signs yet remained unresponsive to commands and painful stimuli and subsequently developed immobility and mutism. Systematic evaluation excluded common aetiologies of delayed emergence. Psychiatric assessment led to a Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnosis of major depressive disorder; catatonia was suspected with a Bush-Francis Catatonia Rating Scale score of 22. A lorazepam challenge (2 mg i.v.) produced marked improvement within 20 minutes, confirming the diagnosis, and scheduled lorazepam (2 mg i.v. four times daily) with sertraline (25 mg orally twice daily) resulted in significant recovery within two days, enabling ward transfer on Postoperative Day (POD) 3 and discharge on day 5 with scheduled psychiatric follow-up. This report highlights that postoperative catatonia, potentially precipitated by perioperative stressors and neurotransmitter dysregulation, should be included in the differential diagnosis of delayed emergence, and that early psychiatric consultation and benzodiazepine therapy can rapidly reverse symptoms and reduce morbidity.

Keywords: Adolescent catatonia, Depressive disorder, Postoperative complications

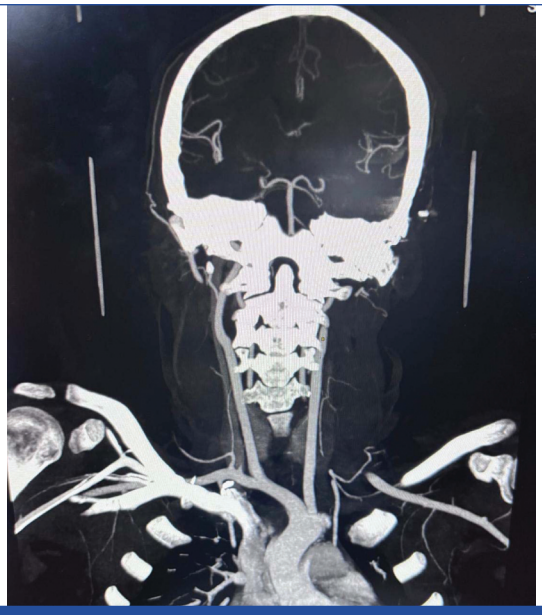
CASE REPORT

A 15-year-old adolescent girl with a body mass index of 28.4 kg/m² (weight 71.8 kg, height 159 cm) and American Society of Anaesthesiologists' physical status II was scheduled for elective left cochlear implantation. No pre-existing medical, surgical, psychiatric or neurological conditions were reported during the routine pre-anaesthesia evaluation. However, subsequent history during postoperative period revealed pre-existing depressive symptoms, likely precipitated by surgical stress. Laboratory investigations, including thyroid function tests, were within normal limits. The surgical procedure involved cochlear implantation under general anaesthesia. Anaesthesia induction was performed with intravenous propofol (2 mg/kg), fentanyl (2 µg/kg), and atracurium (0.5 mg/kg) for neuromuscular blockade. Maintenance was achieved with a mixture of air, oxygen, and sevoflurane to maintain a minimum alveolar concentration of 0.9 to 1.0. A dexmedetomidine infusion (0.5 µg/kg/hr) was started post-intubation and continued intraoperatively. Neuromuscular blockade reversal was done with neostigmine (0.05 mg/kg) and glycopyrrolate (0.01 mg/kg) after meeting extubation criteria. Postoperatively, the patient maintained spontaneous respiration and stable vital signs (temperature 36.6°C, heart rate 84 bpm with normal sinus rhythm, blood pressure 122/74 mmHg, oxygen saturation 100% on room air). Despite this, she remained unresponsive to verbal commands and painful stimuli, eventually developed immobility and mutism. Common causes of delayed emergence were ruled out: capillary blood glucose was 132 mg/dL, and arterial blood gas analysis and serum electrolytes were normal. Neurological evaluation showed equal and reactive pupils, symmetric facial features without droop or stiffness, normal muscle tone without rigidity or tremor, and deep tendon reflexes at 2+ with an absent Babinski reflex. Neuroimaging, non-contrast CT head [Table/Fig-1] and CT angiogram of the neck and intracranial vessels [Table/Fig-2] revealed no abnormalities, while the electroencephalogram demonstrated alpha wave activity without epileptiform discharges.

The psychiatric evaluation identified pre-existing depressive symptoms for 3-4 months, precipitated by surgical stress, leading to a formal diagnosis of Major Depressive Disorder (MDD) as per DSM-5 criteria [1]. There was no history of substance abuse, self-harm behaviours, suicidal ideation, or violent behaviour. The psychiatrist suspected catatonia supported by Bush-Francis Catatonia Rating Scale [2] score of 22 [Table/Fig-3] and advised a lorazepam challenge test [3,4]. The scale comprises 23 items



[Table/Fig-1]: Depicts normal computed tomographic (CT) scan of brain.



[Table/Fig-2]: Depicts normal computed tomography of neck vessel angiogram.

to quantify catatonic signs. It comprises 14 items scored on a 0-3 severity scale and nine items scored binarily as 0 or 3. The total score of 22 indicates a severe presentation of catatonia. The patient was shifted to the paediatric intensive care unit, and 2 mg of intravenous lorazepam was administered over two minutes with monitoring of vital signs. The lorazepam challenge test result was a marked improvement in the patient's responsiveness within 20 minutes of administering 2 mg intravenous lorazepam under continuous vital sign monitoring in the paediatric intensive care unit [Table/Fig-4]. This response with decline in Bush-Francis Catatonia Rating Scale to 5 corroborated the diagnosis of catatonia and guided subsequent initiation of benzodiazepine treatment. She was subsequently started on lorazepam 2 mg intravenously four times a day and oral sertraline 25 mg twice a day. Following the intervention, the patient demonstrated the rapid resolution of mutism and stupor. She was advised to continue maintenance antidepressant pharmacotherapy and was subsequently transferred to the ward on POD 3. The patient was discharged on POD 5 with scheduled psychiatric follow-up.

Item No.	Symptom description	Pre-intervention Score	Post-intervention score
1	Immobility/Stupor: Extreme hypoactivity, immobile, minimally responsive to stimuli	3	2
2	Mutism: Verbally unresponsive or minimally responsive	3	1
3	Staring: Fixed gaze, little/no visual scanning, decreased blinking	2	1
4	Posturing/Catalepsy: Spontaneous maintenance of posture	2	1
5	Grimacing: Odd facial expressions.	0	0
6	Echopraxia/Echolalia: Mimicking movements or speech	0	0
7	Stereotypy: Repetitive, non-goal-directed motor activity	0	0
8	Mannerisms: Odd, purposeful movements	0	0
9	Verbigeration: Stereotyped, meaningless repetition of words/phrases	0	0
10	Rigidity: Resistance to movement, excluding cog-wheeling/tremor	0	0
11	Negativism: Motiveless resistance to instructions or movement	3	0
12	Waxy Flexibility: Slow resistance then acceptance of repositioning	3	0
13	Withdrawal: Refusal to eat/drink/make eye contact	3	0
14	Excitement: Extreme hyperactivity, non-purposeful	0	0
15	Impulsivity: Sudden inappropriate behaviour without provocation	0	0
16	Automatic obedience: Exaggerated cooperation or spontaneous continuation	0	0
17	Passive obedience (Mitgehen): Limb moves with light pressure despite instructions	0	0
18	Muscle Resistance (Gegenhalten): Involuntary resistance increasing with movement speed	3	0
19	Motorically Stuck (Ambitendency): Hesitant, indecisive motor movements	0	0
20	Grasp Reflex: Automatic hand closure when palm is struck	0	0
21	Perseveration: Repeatedly returning to same topic or movement	0	0
22	Combativeness: Belligerence/aggression without explanation	0	0
23	Autonomic Abnormality: Abnormal temperature, BP, pulse, respiration, sweating, flushing	0	0
	Total Score	22	5

[Table/Fig-3]: Bush-Francis Catatonia Rating Scale (BFCRS) scoring for the patient.

Clinical Parameter	Before Intervention	20 minutes Post-Lorazepam (2 mg i.v.)	48 hours Post-Treatment
Vitals (HR/BP)	HR: 84 bpm, BP: 122/74 mmHg	HR: 80 bpm, BP: 118/72 mmHg	Stable, HR: 76 bpm, BP: 115/70 mmHg
Respiration	Spontaneous (SpO2 100% on room air)	Spontaneous (SpO2 100% on room air)	Spontaneous, normal
General Condition	Unresponsive to verbal/painful stimuli	Responsive, tracking with eyes	Normal communication, fully oriented
Motor/Speech	Immobility and mutism present	Improved muscle tone, speech returned	Fully ambulatory, no motor deficits

[Table/Fig-4]: Summary of patient's clinical parameters before and after lorazepam challenge test.
Comparison of vital signs, respiratory status, general condition, and motor/speech symptoms before intervention, 20 minutes post-intervention with 2 mg intravenous lorazepam, and 48 hours following initiation of scheduled maintenance therapy. Abbreviations: HR: Heart rate; BP: Blood pressure; bpm: beats per minute; mmHg: millimetres of mercury; SpO_2: oxygen saturation.

DISCUSSION

Catatonia is a neuropsychiatric syndrome characterised by a range of motor, behavioural, and autonomic abnormalities such as mutism, immobility, negativism, and stupor. Though it was classified as a subtype of schizophrenia historically, contemporary understanding recognises catatonia as a trans-diagnostic syndrome that can occur across various psychiatric, neurological, metabolic, and medical conditions [5]. Delayed recognition of postoperative catatonia is common because psychiatric causes are rarely considered immediately after surgery. Identifying catatonia early in the perioperative setting is crucial to prevent prolonged hospital stays and serious complications [6].

In the current case, the 15-year-old adolescent demonstrated postoperative mutism and unresponsiveness following cochlear implantation, which was subsequently diagnosed as catatonia precipitated by surgical stress and linked to MDD. When compared to the literature on perioperative catatonia, several parallels emerge [7-10]. While the patient's symptoms were primarily related to unmasking depressive symptoms under surgical stress, both cases highlight how underlying pharmacotherapy and perioperative neuromodulation can precipitate catatonic symptoms. A similar

presentation of acute, uncommunicative states immediately following surgery was observed by Genda Y et al., who described a 60-year-old man who underwent oesophagectomy and developed catatonia in the intensive care unit [7]. The condition was identified and managed successfully with benzodiazepines, leading to rapid recovery similar to this case and is supported by neurotransmitter dysregulation theory of catatonia, involving an imbalance between Gamma-Aminobutyric Acid (GABA) [8]. Kalivas KK and Bourgeois JA described catatonia in patients after orthotopic liver transplantation, demonstrating that complex metabolic, neurologic, and pharmacologic interactions can masquerade as delirium or catatonia [9]. Similarly, Rafizadeh S et al., described unresponsive patients in the post-anaesthesia care unit who were ultimately diagnosed with psychosomatic catatonia [10]. Syed H et al., (2025) illustrated that electroconvulsive therapy and high-dose benzodiazepines are effective, even in patients with prior neurosurgical procedures [11]. In our patient, intravenous lorazepam (2 mg) resolved the condition, matching the standard response observed in other postoperative catatonia literature [3]. A systematic review demonstrated that catatonia occurs with high frequency in paediatric postoperative cerebellar mutism syndrome, consistently presenting with mutism and immobility [12]. These findings correlate directly with the immobility and mutism seen in the current case, reinforcing the hypothesis that paediatric populations can exhibit catatonia because of physiological and surgical stress.

The differential diagnosis required the systematic exclusion of other conditions that can present as delayed emergence. Potential causes considered included neurological events such as stroke and status epilepticus, metabolic disturbances, residual anaesthetic effects, and other common causes of delayed emergence. These were systematically ruled out through clinical examination, laboratory investigations, and imaging studies. The Bush-Francis Catatonia Rating Scale was used to quantify catatonia severity, with a score of 22 indicating significant catatonic symptoms. The lorazepam challenge test, involving the administration of 2 mg intravenous lorazepam, was performed to confirm the diagnosis; marked improvement in responsiveness within 20 minutes supported the diagnosis of catatonia.

Pharmacological intervention primarily centers on benzodiazepines, which potentiate GABA-A receptor activity and provide rapid symptomatic relief [3]. Seetharaman A et al., described Lorazepam is the preferred agent, serving both as a diagnostic tool via the lorazepam challenge test and as first-line treatment with scheduled dosing [4]. In cases where benzodiazepines are insufficient, NMDA receptor antagonists such as amantadine or memantine or electroconvulsive therapy can be considered [13,14].

For anaesthesiologists and perioperative care teams, this case underscores the necessity of maintaining a broad differential diagnosis when faced with delayed emergence from anaesthesia. Protocols should include guidelines for early identification of at-risk patients through detailed psychosocial assessments, systematic exclusion of organic causes of delayed emergence, and prompt psychiatric evaluation [15]. Incorporating these steps into perioperative care pathways will improve diagnostic accuracy reduce morbidity, and optimise patient outcomes. Multidisciplinary collaboration is crucial to ensure comprehensive assessment, timely diagnosis, and initiation of appropriate treatment.

CONCLUSION(S)

This case report highlights a rare instance of postoperative catatonia in a 15-year-old adolescent following cochlear implantation, initially masquerading as delayed emergence from anaesthesia. Following the exclusion of organic aetiologies, the diagnosis was confirmed using the Bush-Francis Catatonia Rating Scale and a positive lorazepam challenge test. Prompt initiation of benzodiazepine therapy resulted in rapid resolution of symptoms. This case underscores the need to include psychiatric emergencies in the differential diagnosis of delayed emergence. Clinicians should maintain high vigilance, foster multidisciplinary collaboration among anaesthesiologists, neurologists, and psychiatrists, and utilise structured assessments to ensure timely identification and management.

REFERENCES

[1] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. DSM-5-TR. American Psychiatric Association Publishing. Epub ahead of print 18 March 2022. Doi: 10.1176/appi.books.9780890425787.
[2] Bush G, Fink M, Petrides G, Dowling F, Francis A. Catatonia I. Rating scale and standardized examination. Acta Psychiatr Scand. 1996;93:129-36.
[3] Bot L, Schotsman B, Oostra E, Hoogendoorn AW, Storosum BWC, Planting CHM, et al. The effect of benzodiazepines on catatonia: A systematic review and meta-analysis. Acta Psychiatr Scand; n/a. Doi: 10.1111/acps.70102.
[4] Seetharaman A, Chauhan VS, Adhvaryu A, Prakash J. Lorazepam challenge test: A unique clinical response in catatonia. Ind Psychiatry J. 2021;30:S235-S236.
[5] Adorjan K, Falkai P, Pogarell O. Catatonia in clinical reality: Underdiagnosed and forgotten. MMW Fortschr Med. 2019;161:07-11.
[6] Mustafa FA, Nayar A. Misdiagnosis of Catatonia. Psychopharmacol Bull. 2020;50:48-50.
[7] Genda Y, Mase H, Sakamoto A. Importance of early diagnosis and treatment of perioperative catatonia: A case report. J Nippon Med Sch Nippon Ika Daigaku Zasshi. 2024;91:347-50.
[8] Naguy A, Pridmore S, Ozidu V, Alamiri B. Psychopharmacology of catatonia: A tour d'horizon. Psychopharmacol Bull. 2025;55:64-69.
[9] Kalivas KK, Bourgeois JA. Catatonia after liver and kidney transplantation. Gen Hosp Psychiatry. 2009;31:196-98.
[10] Rafizadeh S, Kerry-Gnazzo AR, DeWalt K. An unresponsive patient in postanesthesia care unit: A case report of an unusual diagnosis for a common problem. AA Pract. 2020;14:e01293.
[11] Syed H, Shakespeare D, AbouHatab R, Miller M. Bridging the cartesian divide between organic and functional catatonia: A case report. Cureus. 2025;17:e96402.
[12] Jaimes-Albornoz W, Wu P, de Mendaza-Martínez de Icaya LG, Rozali F, Martínez-Querol M, Smith R, et al. Catatonia associated with pediatric postoperative cerebellar mutism syndrome. Childs Nerv Syst ChNS Off J Int Soc Pediatr Neurosurg. 2024;40:2019-32.
[13] Lloyd JR, Silverman ER, Kugler JL, Cooper JJ. Electroconvulsive Therapy for Patients with Catatonia: Current Perspectives. Neuropsychiatr Dis Treat. 2020;16:2191-208.
[14] Lee JH, Suzuki J. N-methyl-d-aspartate (NMDA) receptor antagonists for treatment of catatonia in adults: Narrative review. Gen Hosp Psychiatry. 2024;91:60-65.
[15] Shah H, Somaiya M, Chauhan N, Gautam A. Clinical practice guidelines for assessment and management of children and adolescents presenting with psychiatric emergencies. Indian J Psychiatry. 2023;65:159-74.

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