Functional neurological symptoms masquerading as Wernicke encephalopathy following bariatric surgery

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ABSTRACT

Wernicke encephalopathy (WE), caused by thiamine deficiency, is classically associated with alcoholism but is increasingly recognized among patients who have undergone bariatric surgery. As with other neurocognitive conditions, alternative explanations for symptoms, such as psychiatric, neurological, and motivational factors, must be considered before arriving at a diagnosis of WE. We present a patient after sleeve gastrectomy who was presumed to have WE; after detailed neuropsychological assessment, the condition was better conceptualized as a conversion disorder. The case illustrates the heretofore unrecognized role of bariatric surgery in the development of functional symptoms and demonstrates the importance of neuropsychological assessment in detecting functional symptoms.

KEYWORDS Bariatric surgery; conversion disorder; neuropsychology; somatic symptom disorder; Wernicke encephalopathy

Wernicke encephalopathy (WE) is caused by thiamine deficiency and is clinically diagnosed by the presence of at least two of the following: (1) evidence of dietary deficiency by laboratory results or history; (2) oculomotor abnormalities (e.g., nystagmus); (3) cerebellar dysfunction (e.g., ataxia, dysmetria); and (4) altered mental status or mild memory impairment.^{1,2} WE is increasingly recognized in bariatric surgery patients,³ although diagnosis may be complicated by psychiatric factors. In a patient who had undergone sleeve gastrectomy, we present a case of presumed WE that was found to be a conversion disorder.

CASE DESCRIPTION

A 36-year-old right-handed white preschool teacher with 16 years of education had undergone sleeve gastrectomy at an outside hospital 11 months prior to the current evaluation. Per her report, she had not received a presurgical behavioral health evaluation. Her husband indicated that she had an excellent recovery in the 4 to 6 weeks following the surgery. She subsequently developed acute memory loss, disorientation, dizziness, nausea, vomiting, ataxia, and repeated falls. The operating surgeon advised the patient to go for vitamin infusions and parenteral B1 injections due to

suspicion of WE. Infusions did not result in permanent resolution of symptoms, such that the patient presented to another hospital about 2 months later. A head computed tomography scan was read as normal, and the patient was discharged the same day with recommendation to follow up with neurology.

Blood tests nearly 3 months after surgery revealed vitamin B12 (917 pg/mL) and elevated B1 (209 nmol/L) within normal limits. She followed up with outpatient neurology with improved symptoms, a normal neurologic exam, and a 29/30 on the Mini-Mental Status Exam. The provider recommended no further intervention. The patient was dissatisfied with this visit and canceled all follow-up appointments with the neurologist.

She followed up with a different neurologist 10 months after surgery. Her B12 level was 1790 pg/mL, and her B1 level was 288 nmol/L. The patient reported arm tremors, memory loss, stuttering, word-finding difficulties, problems with self-expression, and intermittent hand and feet numbness. Montreal Cognitive Assessment at this visit was 18/30. The provider ordered magnetic resonance imaging of the brain and an electroencephalogram, which were both read as normal.

At follow-up with neurology 11 months after surgery, the provider discussed the normal laboratory, neuroimaging, and electroencephalogram findings and suggested that the presenting problems were attributable to anxiety. She and her spouse again expressed dissatisfaction with his explanation.

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Table 1. The patient's neuropsychological test results

Test domain	Raw score	Percentile	Descriptor ^a /interpretation
Performance validity			
TOMM trial 1	31	—	Suggestive of invalid performance
TOMM trial 2	43	—	Suggestive of invalid performance
TOMM retention	36	—	Suggestive of invalid performance
Reliable digit span	5	—	Suggestive of invalid performance
CVLT-II: forced choice	14	—	Suggestive of invalid performance
Motor speed			
GPB dominant hand	81	4	Low score
GPB nondominant hand	87		Below average score
Attention			
WAIS-IV digit span	13	1	Extremely low score
Processing speed			
Trail Making Test part A	53	1	Extremely low score
Stroop word reading	47	<1	Extremely low score
Stroop color naming	40	<1	Extremely low score
Language			
BNT-30	21	<1	Extremely low score
Animal fluency	8	<1	Extremely low score
Visuospatial			
NAB VisD	12	<1	Extremely low score
BVMT copy	12/12	—	Intact
Memory			
BVMT trials 1–3 total	13	1	Extremely low score
BVMT delayed recall	5	<1	Extremely low score
BVMT recognition	3	<1	Extremely low score
CVLT-II trials 1–5 total	22	<1	Extremely low score
CVLT-II short-delay recall	2	<1	Extremely low score
CVLT-II long-delay recall	3	<1	Extremely low score
CVLT-II recognition	1.20	<1	Extremely low score
WMS-IV LM I	13	<1	Extremely low score
WMS-IV LM II	9	<1	Extremely low score
WMS-IV LM recognition	19	3–9	Low score

(continued)

Table 1. Continued

Test domain	Raw score	Percentile	Descriptor ^a /interpretation
Executive functioning			
COWA	20	1	Extremely low score
MWCST	6	54	Average
Trail Making Test part B	115	1	Extremely low score
Stroop inhibition	16	<1	Extremely low score
Emotional functioning			
BDI-2	25	—	Moderate depression
GAD-7	12	—	Moderate anxiety
Personality functioning			
MMPI-II-RF RBS ^b	14	>99	Possible overreporting; invalid profile

^aDescriptors for cognitive variables based on consensus recommendations.¹³^bBecause item responses yielded an invalid profile, remaining scores are not presented.

BDI-2 indicates Beck Depression Inventory–second edition; BNT-30, Boston Naming Test, 30-item version; BVMT, Brief Visuospatial Memory Test; COWA, Controlled Oral Word Association; CVLT-II, California Verbal Learning Test–second edition; GAD-7, Generalized Anxiety Disorder-7; GPB, grooved pegboard; MMPI-II-RF RBS, NAB Minnesota Multiphasic Personality Questionnaire-2-Restructured Form Response Bias Scale; MWCST, Modified Wisconsin Card Sorting Test; TOMM, Test of Memory Malingering; VisD, Neuropsychological Assessment Battery–Visual Discrimination; WAIS-IV, Wechsler Adult Intelligence Scale–Fourth Edition; WMS-IV LM, Wechsler Memory Scale–Fourth Edition–Logical Memory.

The patient was referred for neuropsychological evaluation and seen 11 months postoperatively.

Cognitively, the patient reported attention, language, visuospatial, memory, and executive problems. The patient's husband questioned whether her symptoms might be consistent with "Wernicke-Korsakoff's" and implied that fluctuations in cognition appeared to be correlated with missed doses of thiamine. Functionally, she reported that she was able to complete basic activities of daily living without difficulty but noted dependence for most complex tasks. Her husband had taken over all driving and was managing her medications, finances, and medical appointments due to mistakes made by the patient. While still employed as a preschool teacher, the patient was planning to leave her job in the next week and was considering applying for disability.

Regarding psychiatric symptoms, she reported that she was raped as a teenager with a subsequent suicide attempt and a 3-day inpatient psychiatric hospitalization. The patient described having bouts of re-experiencing symptoms related to this event, as well as depression and anxiety, on and off for her whole life. She noted that she has been on psychiatric medications and participated in therapy intermittently since the sexual assault but was not currently receiving treatment. At the current evaluation, she reported some depression but denied suicidal ideation and self-injurious behavior. *Table 1* provides a summary of neuropsychological test data.

DISCUSSION

As shown in *Table 1*, the patient's scores on performance validity indicators were below the recommended cut points to suggest invalid performance. Additionally, she demonstrated a tendency to report more symptoms than individuals with actual medical conditions. Importantly, her performance on cognitive tests was inconsistent with her report of daily functioning. For instance, her low scores were consistent with performance of an individual with moderate-stage dementia, while she continued to work.

Test findings, combined with normal neuroimaging, electroencephalogram, and laboratory results, suggested that the patient's presentation was not consistent with neurological damage. WE seemed unlikely, given the absence of observed oculomotor abnormalities, gait disturbances, dyscoordination, or evidence of thiamine deficiency. Rather, her symptoms may best be conceptualized as a conversion disorder.⁴ This diagnosis is consistent with prior research. She reported an extensive psychiatric history and recent stressful life events, two important risk factors for developing medically unexplained symptoms.^{5–7} Additionally, she demonstrated heavy health care resource utilization⁸ and disavowed psychiatric explanations for her symptoms in favor of more traditionally “organic” explanations.⁹

This case has important implications for clinical practice. It highlights the importance of presurgical psychological evaluations, which are recommended in practice guidelines from the American Society for Metabolic and Bariatric Surgery¹⁰ and may have prevented decompensation and debility in this case. Second, this report illustrates the potential utility of including symptom validity tests in presurgical evaluations. Importantly, these measures are embedded in existing personality tests often used in clinical practice,¹¹ such as the Minnesota Multiphasic Personality Inventory. Performance validity measures (e.g., the Test of Memory Malingering) may also be useful when making bariatric presurgical recommendations, a possibility being explored for other types of surgical interventions.¹²

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