



Wernicke Encephalopathy After Billroth's II Operation: A Case Report

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Abstract

Introduction: Thiamine deficiency can happen after gastrectomy due to Small intestinal bacterial overgrowth (SIBO) that leads to Wernicke encephalopathy; it is characterized by the triad- ophthalmoplegia, ataxia and confusion.

Case Presentation: A 52 year old male patient presented with confusion, diplopia, amnesia and ataxia to the Razi hospital at Birjand in Iran. Cranial nerves and neurological examinations were normal. MRI, LP and abdominal sonography were also normal. Due to normal para-clinic procedure and symptom progression being observed, the patient was treated with oral and IV vitamin B1. After 3 days of treatment the patient's condition improved and after one week he made a complete recovery with no complaints of confusion, diplopia, ataxia or amnesia.

Conclusions: In patients with a history of surgery and mental status changes, ataxia and ophthalmoplegia should be considered from the outset of treatment because certain irreversible neurological complaints could arise due to Korsakoff syndrome.

Keywords: Gastroenterostomy, Korsakoff Syndrome, Thiamine Deficiency, Wernicke Encephalopathy

1. Introduction

Due to gastric operation, micro and macro-nutrients, especially B group vitamins (B1, B12), are decreased (1, 2), which can cause neurological complications. Thiamine is an important enzyme for the biochemical pathway in the central nervous system and peripheral nervous system (3). Almost 50 mg of thiamine is necessary in the body, and its half time is almost 9 to 18 days (1). An acute neurological disorder can occur due to vitamin B1 deficiency, which is characterized by a triad of ophthalmoplegia and nystagmus, motor ataxia, and confusion, but only 16% of patients exhibit all the three features (4). These symptoms can appear with psychological symptoms like mood disorders, depression, anxiety, insomnia, dementia, amnesia, and lower limb paresis (5, 6).

In different studies, thiamine deficiency has been reported after gastrectomy due to small intestinal bacterial overgrowth. Thiamine deficiency can lead to Wernicke encephalopathy (WE) (7, 8), which is diagnosed by severe cognition loss, confusion, mental disorders, ataxia, nystagmus, and ophthalmoparesis. The most common sign of WE is altered mental status (1, 3). WE can progress to Korsakoff syndrome, which is characterized by the inability to make new memories, relatively diminished brain function, and confabulation (9). There are some risk factors for WE, such as not receiving vitamin B1 after gastric opera-

tion, repetitive vomiting after surgery, low level of vitamin B1 in women, prolonged total parenteral nutrition, fatty liver, and alcohol abuse. In reported case series articles, the occurrence of WE was reported 2 weeks to 7 months after surgery (3, 10). Thiamine is mainly absorbed in the first section of the small intestine (D1); thus, WE is not expected in Billroth's II operation (gastroenterostomy) (1).

2. Case Presentation

We present the case of a 52-year-old male patient with confusion, diplopia, amnesia, and ataxia following Billroth's II operation, who visited Razi Hospital affiliated to Birjand University of Medical Sciences, Iran. His symptoms had aggravated gradually since one week ago. On ophthalmic examination, his eye movement was restricted to the lateral side, and he had bilateral paresis of the sixth nerve. The rest of the eye movement was normal. Visual acuity and visual field were normal. No signs of ptosis and papilledema were observed. The patient was reactive to light and had midsize pupils, and other cranial nerves were normal. No signs of paraparesis were present. Deep tendon reflexes were normal, and bilateral Babinski response was negative and flex. On the cerebellar examination, gait examination was normal, no signs of dysarthria were found, and he had no problems in handwriting. The

patient had bilateral nystagmus. Finger to nose test was normal. The diadochokinetic test was normal. Only in the tandem gait test, he had a short deviation to the right. No signs of sensory examination were observed. His level of consciousness was decreased, and the patient had complaint of amnesia and trouble in recent memory. The other neurological examinations were normal. The patient had no complaints of headache or vertigo and came to us with only diplopia and ataxia.

Magnetic resonance imaging (MRI) was performed for the patient that was normal. He had a history of upper and lower gastrointestinal bleeding and had had gastric ulcer bleeding and D1 perforation 4 years ago. Then, he had undergone an operation for the closing of the distal gastric portion, gastrojejunostomy loop, and brown jejunostomy (Billroth II). Due to the past gastric issues, we consulted a gastroenterologist, and abdominal sonography showed that intra and extra hepatic bile ducts were normal. The transverse diameter of the gall bladder was 26 mm and normal and contained a 6-mm diameter stone. The spleen, pancreas, kidneys, and bladder were normal.

On endoscopy, a large amount of bile secretions was seen at the end of the stomach, and the afferent and efferent loops were normal (Table 1).

Due to normal endoscopy and continuation of diplopia and involvement of the sixth cranial nerve, lumbar puncture was performed (Table 2).

CSF (cerebrospinal fluid) pressure: 16 cmH₂O; WBC: not seen; RBC: not seen; protein: 35; Bs (blood sugar): 83; other paraclinical features:

Due to normal paraclinical features, progression of the symptoms and lack of any differential diagnoses (i.e., diabetes, myasthenia gravis, Guillen barre, immune deficiency, cancer, subacute meningitis, brucellosis, fungus or other cavernous sinus infections, tuberculosis, carcinomatosis meningitis, increased intracranial pressure, or brainstem infarction) and suspicion to WE, we immediately began treatment with 500 mg IV thiamin TDS for three days. Afterwards, 250 mg IV (2) or 500 mg IM (1) of

Table 1. Endoscopy Results

Endoscopy	Results
Esophagus	Normal
Cardia	Normal
Fundus	Normal
Body	A large amount of bile secretions
Duodenum	Efferent loop was normal
Pathology	Small intestine mucosa with mild acute erosive inflammation; no parasites; no gastric mucosa included in this specimen

Table 2. Other Paraclinical Features

Paraclinical Features	Results
PPD test	Neg.
Wright	Neg.
Wbc	6.74
B 12 level	464.5
Tsh	1.25
Ferritin	121.4
Na/K	142/3.7
2ME	Neg.
Hb	14.5
Plt	204
BLL	3.1
Free t4	1.68
Alt/Ast	16/19
Fbs/HbA1c	87/5.5

Abbreviations: ALT, alanine aminotransferase; AST, aspartate aminotransferase; BLL, blood lead level; PPD test, purified protein derivative test; TSH, thyroid stimulating hormone; 2-ME, 2-Mercaptoethanol.

thiamine is continued for 3 to 5 days in such patients, and after several months of complete recovery, they are given 60 mg oral thiamine (2). Vitamin B1 level was not measured for this patient because we could not measure it in our center, but our suspicion was WE. Our patient was treated with 300 mg of oral vitamin B1 and IV vitamin B complex daily. After three days of treatment, the patient's condition improved, and his diplopia, ataxia, and amnesia completely resolved after one week.

3. Discussion

Thiamine deficiency can lead to the onset of peripheral polyneuropathy or WE, which requires immediate diagnosis and treatment (11). In two similar studies, thiamine deficiency was reported after gastrectomy due to small intestinal bacterial overgrowth, similar to what had probably occurred to our patient (7, 8). Our patient had confusion, diplopia, and ataxia after Billroth's operation II.

Dino Kröl in his review article reported 13 cases of WE after sleeve gastrectomy (SG) in the literature. The onset of WE was between 12 days and up to 7 months after surgery (3), but in our patient it happened after 4 years. Although 94% of WE cases are seen within 6 months after surgery (12), Dino Kröl reported that several patients had residual neurologic deficits, including Korsakoff syndrome, amnesia, and memory loss, nystagmus and persisting neuropathy (3). Only one-third of the patients with WE after SG attained

complete recovery. Despite early beginning of treatment, complete recovery is rare (3). Our patient had complete recovery after one week without any complications. Alias in his article reported the case of a 22-year-old female patient who had undergone a sleeve gastrectomy presented to the emergency room for breasts and her knees numbness, vertigo, confusion, and memory loss since two days ago. Blood thiamine level was 27 nmol/L (reference range: 74 - 222 nmol/L). IV thiamine was administered, and blood thiamine level after 8 days was reported 181 nmol/L. The paresthesia in her legs resolved and her memory and nystagmus improved significantly (13).

Fernando Pardo-Aranda in his literature review reported a 20-year-old man who had undergone laparoscopic SG with uneventful recovery. Five weeks after surgery he was admitted due to generalized weakness, restrictions of actions, confusion, motor ataxia, diplopia and nystagmus. Vitamin B1 level was reported 12.2 ng/mL. Due to the low level of vitamin B1 and his symptoms, a presumed diagnosis was WE. Thiamine 100 mg/day was administered. The patient was discharged asymptotically with the oral intake of 600 mg per day of vitamin B1 (12). WE has a 20% mortality rate when it remains untreated. It is necessary not to delay treatment for this condition. Therefore, thiamine must be started as soon as possible, even with a presumptive diagnosis. Definitive diagnosis will be confirmed if patient symptoms improve with the treatment (4). This deficiency is easily preventable, and surgeons should be aware of this complication and patients should be warned about it. We propose that prophylactic Vit. B1 should be administered to patients with predisposing factors.

3.1. Conclusions

In patients with a history of surgery and mental status changes, ataxia, and ophthalmoplegia, WE should be considered and treatment with thiamine immediately should be started immediately, because it could cause some irreversible neurological complaints such as Korsakoff syndrome. The supplementation of thiamine (multivitamin compounds) might be beneficial to lower the potential risk for severe thiamine deficiency leading to WE.

Footnotes

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Patient Consent: This study was conducted with the approval of the patient and under the supervision of Birjand University of Medical Sciences.

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