Case Report

Wernicke encephalopathy following gastrojejunostomy: A case report and review of the literature

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A B S T R A C T

Introduction: Non-alcoholic Wernicke encephalopathy (WE) is a life-threatening condition, which is caused due to thiamine deficiency. We reported a case of non-alcoholic WE following gastrojejunostomy.

Case presentation: A 31-year-old woman was admitted to our tertiary care center complaining about intractable nausea and vomiting following her gastrojejunostomy. She had undergone gastrojejunostomy because of gastric outlet obstruction after a suicide attempt with scale-remover. Two weeks after gastrojejunostomy, the altered mental status and confusion were reported and she also had a reduced range of motion, dysarthria, generalized muscle weakness, and vertical nystagmus. She gradually became uninterested in surroundings. WE was considered a differential diagnosis, which was confirmed by magnetic resonance imaging (MRI). High-dose intravenous thiamine administration was done for the patient and her symptoms were improved. We also reviewed the PubMed to evaluate studies on WE following gastrointestinal surgeries conducted through the last 10 years.

Conclusion: WE is a rare presentation of gastrojejunostomy and it should be considered as differential diagnosis when patient had impaired mental status and other related WE symptoms following gastrointestinal surgeries. Early diagnosis and management of WE in the Emergency Department can reduce the mortality and morbidity of WE.

1. Introduction

Wernicke encephalopathy (WE) is an acute disorder of central nervous system, which can be caused due to thiamine deficiency. Acute mental confusion, ophthalmoparesis, and ataxia have introduced as the clinical triad of WE. It was first described by Carl Wernicke. Thiamine plays an important role in cerebral fuel utilization as an integral part of metabolic pathways.

Thiamine deficiency and other related metabolic disorders, especially during increased metabolic demands, can cause an initially reversible nervous system injury due to overproduction of the reactive oxygen species and also destruction of the blood-brain-barrier (BBB). Chronic alcoholism is the most common causative factor for thiamine deficiency, followed by malnutrition and the decreased thiamine absorption, i.e. gastrointestinal (GI) surgery, including bariatric surgery, gastrectomy, and colectomy known as non-alcoholic causes of WE. Moreover, several GI predisposing factors can increase the risk of thiamine malabsorption and should be considered as the causative factors for WE. Also, early diagnosis and management of WE in the Emergency Department (ED) can reduce the subsequent complications. In this case report, a patient with WE, who had frequent vomiting and had undergone gastrojejunostomy is described.

A systematic search was conducted through PubMed for case series, case reports, letter to the editor, and other published articles on gastrointestinal surgery leading to WE and published in recent ten years, during July 2009 to Jun 2019. The inclusion criteria included the studies published in English, French and Swedish, and also those reporting the age, gender, cause of surgery, and the time from surgery to WE diagnosis in the studied patients. The keywords were as follows: “Wernicke” or “Wernicke Encephalopathy” or “Wernicke’s” or “Wernicke’s Encephalopathy”.

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2. Case Presentation

A 31-year-old non-alcoholic woman with a history of depression was referred to our tertiary care center. She had attempted suicide by taking scale-remover and was immediately transferred to the hospital. Following initial evaluations, she underwent upper GI endoscopy, by which severe erythema, scaling, streaks of dark-red blood, friable mucosa in the esophagus, stomach, and duodenum with abundant exudate were found. The healing process was observed two days after endoscopy.

Ten days later, the patient had developed nausea and vomiting and reported oral feeding intolerance (OFI). Accordingly, she readmitted to the GI ward. Possible causes of nausea and vomiting, for example pregnancy, thyroid diseases, brain disorders, electrolyte disturbances, and intestinal obstruction were ruled out. The upper GI endoscopy showed gastric outlet obstruction due to severe pyloric inflammation. The consultant surgeon recommended surgery and the patient underwent gastrojejunostomy. Then the patient was discharged from the surgery ward with a stable condition and without any obstruction symptoms.

Two weeks after gastrojejunostomy, suddenly the altered mental status and confusion were reported, and she also had a reduced range of motion, dysarthria, generalized muscle weakness, and vertical nystagmus. The finger-to-nose examination was bilaterally impaired. She gradually became uninterested in surroundings. At this time, we faced WE, so neurological consultation and brain magnetic resonance imaging (MRI) were requested. The patient’s signs and symptoms made WE as the most probable diagnosis. Finally, the brain MRI revealed high signal intensity in fluid-attenuated inversion recovery (FLAIR) sequence in dorsomedial thalami, tectal plate, and around the third ventricle, by which WE diagnosis was confirmed (Fig. 1).

High-dose thiamine administration was done for the patients as follows: In the first three days, the patient received 500 mg thiamine dissolved in normal saline intravenously and 250 mg thiamine dissolved in normal saline solution intravenously for the next five days followed by oral thiamin 250 mg/day. Five days later, the patient was awake; however she was intubated and apathetic. Through admission, the patient’s conditions and the symptoms were continuously improved. A significant decrease in WE lesions were observed two weeks after MRI (Fig. 1). At discharge, the patient's abnormal gait and her mild dysarthria were improved. The four-month follow-up via neurological examinations showed her normal conditions.

3. Discussion

We reviewed the non-bariatric post-GI procedure of WE reported in patients worldwide between July 2009 and Jun 2019 (Table 1). A total of 10 patients undergoing GI surgery followed by WE, who had the inclusion criteria were descriptively analyzed in terms of demographic data, cause of surgery and the interval between clinical symptoms of WE and GI surgery. Among the reported cases, GI cancers were more prevalent than the others. The male gender was more prevalent (6/10) than female in the previous reports. The mean age of patients was 39.80 years, ranging from 11 to 65 years. The interval between GI surgeries and WE symptoms was 5 days–18 months. In the non-bariatric surgery patients, in 60% of the patients with WE, the symptoms were initiated within one month or earlier after GI surgery.

Underdiagnosis in WE is not low; Day et al.6 reported 68% and 94% underdiagnosis in alcoholic and non-alcoholic WE patients, respectively. Unfortunately, this emergency condition has a high mortality rate up to 20% in WE patients who missing in diagnosis and have not received adequate treatment. Hence, the early diagnosis of WE in the ED, as an acute care ward that patients present there without prior appointment, can avoid wasting time and reduce the mortality rate and underdiagnosis of WE. Due to high missing rate in the diagnosis of WE patient, it should be considered as one of the common differential diagnosis in patients with altered mental status and other related symptom especially in patients with a history of malnutrition, post GI surgery, and alcohol consumption.

Moreover, this patient may need to respiratory support and airway management due to altered mental status and loss of consciousness. Fluid therapy, electrolyte correction may also be indicated. In patients with high suspected WE, parenteral therapy with thiamin should be considered and MRI should be performed for confirm WE diagnosis if
We reviewed previous non-alcoholic Wernicke’s encephalopathy reports due to non-bariatric GI surgery in recent ten years.

### Table 1

<table>
<thead>
<tr>
<th>Reported by</th>
<th>Year</th>
<th>Country</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis/Type of Surgery</th>
<th>Interval between GI surgery and WE</th>
</tr>
</thead>
<tbody>
<tr>
<td>D’Ettorre M et al.</td>
<td>2018</td>
<td>Italy</td>
<td>62</td>
<td>Male</td>
<td>Rectal Cancer/Trans Anal Cancer Resection</td>
<td>5 Days</td>
</tr>
<tr>
<td>Kamasak T et al.</td>
<td>2018</td>
<td>Turkey</td>
<td>11</td>
<td>Female</td>
<td>Bzid Ileus after appendectomy/Ileal Bypass Surgery</td>
<td>1 Month</td>
</tr>
<tr>
<td>Kilinc O et al.</td>
<td>2015</td>
<td>Turkey</td>
<td>38</td>
<td>Female</td>
<td>Head of Pancreas carcinoma/Whipple Procedure (Pancereaticoduodenectomy)</td>
<td>6 Days</td>
</tr>
<tr>
<td>Chen MH et al.</td>
<td>2015</td>
<td>Taiwan</td>
<td>31</td>
<td>Male</td>
<td>History of Penetrating Abdominal Injury/Enterolysis</td>
<td>1 Month</td>
</tr>
<tr>
<td>Arita T et al.</td>
<td>2015</td>
<td>Japan</td>
<td>58</td>
<td>Male</td>
<td>Distal Gastroctomy/Gastric Cancer</td>
<td>9 Months</td>
</tr>
<tr>
<td>Busani S et al.</td>
<td>2014</td>
<td>Italy</td>
<td>46</td>
<td>Female</td>
<td>Stenotic Duodenopancreactectomy</td>
<td>12 Months</td>
</tr>
<tr>
<td>Arslan EA et al.</td>
<td>2014</td>
<td>Turkey</td>
<td>13</td>
<td>Male</td>
<td>Duodenal Stenosis/Surgical Resection of Duodenal</td>
<td>18 Months</td>
</tr>
<tr>
<td>Renna R et al.</td>
<td>2012</td>
<td>Italy</td>
<td>65</td>
<td>Female</td>
<td>Partial Gastroctomy/Gastric Cancer</td>
<td>1 Week</td>
</tr>
<tr>
<td>Onieva-Gonzalez FG et al.</td>
<td>2011</td>
<td>Spain</td>
<td>27</td>
<td>Male</td>
<td>Duodenal Ulcer Bleding/Cephalic Duodenopancreacte</td>
<td>1 Week</td>
</tr>
<tr>
<td>Karayiannakis A et al.</td>
<td>2011</td>
<td>Greece</td>
<td>52</td>
<td>Male</td>
<td>Pancreatic Cancer/Pancereaticoduodenectomy (Whipple Procedure)</td>
<td>14 Months</td>
</tr>
</tbody>
</table>

### 4. Conclusion

In conclusion, WE should be considered as one of the common differential diagnosis in patients with altered mental status and other WE related symptoms especially in post GI surgery patients. Early diagnosis and management of WE in the ED can reduce the mortality and morbidity in patients with WE.

### Consent section

The informed consent was obtained from the patients for publication of the report and radiological findings, as well.

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### References