



Peripheral Nerve Complications After Bariatric Surgery *Bariatrik Cerrahi Sonrası Gelişen Periferik Sinir Komplikasyonları*

✉ Bekir Enes Demiryürek¹, ✉ Kerem Karaman², ✉ Ali Bal²

¹Sakarya University Training and Research Hospital, Clinic of Neurology, Sakarya, Turkey

²Sakarya University Training and Research Hospital, Clinic of General Surgery, Sakarya, Turkey

Keywords: Bariatric surgery, neuropathy, sleeve gastrectomy

Anahtar Kelimeler: Bariatrik cerrahi, nöropati, sleeve gastrektomi

Dear Editor,

Bariatric surgery has been shown to be more effective than the best medical treatment in the treatment of comorbidities associated with weight loss and obesity. Laparoscopic sleeve gastrectomy (LSG) is a standard surgical technique used in the treatment of morbid obesity. Neurologic complications such as encephalopathy, optic neuropathy, myelopathy, polyradiculoneuropathy, and polyneuropathy can be rarely seen after the surgery (1). We discuss peripheral nerve complications after bariatric surgery by reporting 5 patients who were followed up by our clinic.

The medical records of five patients who were admitted to our clinic between May 2016 and June 2017 who underwent bariatric surgery in our hospital or in another center and developed acute-subacute peripheral nerve complication at follow-up were evaluated, retrospectively.

Demographic data (age, sex), medical history of chronic diseases such as diabetes mellitus (DM) and hypertension (HT), use of multivitamins prior to surgery, time of the initiation of symptoms following surgery, body mass index (BMI) prior to surgery, BMI at the initiation of neuropathic symptoms, serum levels of vitamins and minerals (folate, vitamin D, vitamin B12, calcium and albumin) at admission to our clinic, and the treatment plans of the patients were analyzed.

The mean age of the 3 male and 2 female patients was 32.2 years. Three patients had HT, and none had DM. All of the patients

had LSG operations. Only one patient took multivitamin support prior to surgery.

The patients' symptoms began within an average of 3.6 months after surgery. The average BMI prior to surgery was 52.2 kg/m² and an average of 13.4 kg/m² decline in BMI was observed until the beginning of symptoms. Motor deficit and loss of deep tendon reflexes began in the lower limbs and spread to all limbs in 3 patients and 2 patients presented with left foot drop. Electromyography (EMG) showed acute motor axonal polyneuropathy in 2 patients, acute inflammatory demyelinating polyneuropathy in 1 patient, and entrapment neuropathy of the peroneal branch of left sciatic nerve at the level of the fibular head in 2 patients (Table 1).

Serum levels of folate, vitamin D, vitamin B12, and albumin were low in all patients. High protein level (80, 100 and 112 mg/dL) without pleocytosis was detected in the cerebrospinal fluid (CSF) of 3 patients who had acute polyneuropathy.

Multivitamin (folate, vitamins B1, B12 and D) and mineral (calcium) replacement, neuropathic pain treatment, and physiotherapy were performed to all patients, and 3 patients were given intravenous immunoglobulin (IVIG) treatment. Partial improvement was observed in 4 patients and total improvement was observed in 1.

Neurologic complications after bariatric surgery are rare but if they happen, they can increase mortality-morbidity and worsen quality of life. Neurologic complications are observed

Address for Correspondence/Yazışma Adresi: Bekir Enes Demiryürek MD, Sakarya University Training and Research Hospital, Clinic of Neurology, Sakarya, Turkey

Phone: +90 536 933 79 04 E-mail: bekirenes@mynet.com ORCID ID: orcid.org/0000-0003-4221-2506

Received/Geliş Tarihi: 16.11.2017 **Accepted/Kabul Tarihi:** 22.12.2017

©Copyright 2018 by Turkish Neurological Society
Turkish Journal of Neurology published by Galenos Publishing House.

Table 1. Sociodemographic features and body mass index measures in the pre-and postoperative period

Patients	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Average
Age (years)	41	42	34	21	23	32.2
Sex	Male	Female	Female	Male	Male	
BMI prior to surgery	54.1	48.3	50.2	52.1	56.3	52.2
BMI at the beginning of neuropathic pain	12.7	13.9	15.2	11	14.2	13.4
Diagnosis	AMAN	AMAN	AIDP	Left common peroneal neuropathy	Left common peroneal neuropathy	

BMI: Body mass index, AMAN: Acute motor axonal neuropathy, AIDP: Acute inflammatory demyelinating polyneuropathy

in 5-16% of patients and the most frequent is peripheral neuropathy (16%) (2).

Lack of dietary intake, rapid weight loss, repetitive vomiting, absorption abnormality, multivitamin/mineral (folate, vitamins B1, B12 and D, calcium) deficiencies caused by a lack of intrinsic factor and gastric acid are held responsible in the pathogenesis (3). When the symptoms began, the vitamin and mineral levels of the patients were low. Only one patient was given multivitamin/mineral support prior to surgery.

There are hypothesis suggesting that immunologic-inflammatory mechanisms caused by an increase in immune activity secondary to infections may play a role in these complications following rapid weight loss (4).

Also, it was suggested that the lipid tissue surrounding the peripheral nerve may protect the nerve sheath and the loss of lipid tissue may result in neuropathy caused by entrapment by structures adjacent to the peripheral nerve (common peroneal nerve-fibular neck). Entrapment neuropathy due to loss of lipid tissue surrounding the nerve may have been the pathophysiologic mechanism in our 2 patients with common peroneal nerve impairment (5).

Multivitamin/mineral replacement, IVIG treatment, and physiotherapy result in improvement of symptoms (4). We gave IVIG treatment besides aggressive multivitamin replacement treatment in 3 patients who showed features of variants of Guillain-Barré syndrome (GBS) in EMG and albuminocytologic dissociation in CSF investigation.

Excessive and rapid weight loss should be avoided in order to prevent complications and full compliance should be ensured with nutritional and dietary recommendations. All patients should be closely monitored for neurologic symptoms. GBS and its variants

should be kept in mind in the differential diagnosis because it has different treatment options.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: B.E.D., A.B., Concept: B.E.D., Design: B.E.D., Data Collection or Processing: B.E.D., Analysis or Interpretation: B.E.D., K.K., Literature Search: B.E.D., Writing: B.E.D.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Kueper MA, Kramer KM, Kirschniak A, Königsrainer A, Pointner R, Granderath FA. Laparoscopic sleeve gastrectomy: standardized technique of a potential stand alone bariatric procedure in morbidly obese patients. *World J Surg* 2008;32:1462-1465.
2. Thaisetthawatkul P, Collazo-Clavell ML, Sarr MG, Norell JE, Dyck PJ. A controlled study of peripheral neuropathy after bariatric surgery. *Neurology* 2004;63:1462-1470.
3. Landais A. Neurological complications of bariatric surgery. *Obes Surg* 2014;24:1800-1807.
4. Yasawy ZM, Hassan A. Post bariatric Surgery Acute Axonal Polyneuropathy: Doing Your Best is Not Always Enough. *Ann Indian Acad Neurol* 2017;20:309-312.
5. Şencan R, Utku U, Gök M. Bilateral Peroneal Neuropathy after Obesity. *Surgery Turk J Neurol* 2015;21:110-111.