

## Bezoar and Catheter Knotting as Complications of Levodopa Carbidopa Intestinal Gel Therapy

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### Abstract

Parkinson's disease (PD) is an insidious, slowly progressing neurodegenerative disease affecting the nigrostriatal pathway in the brain. Levodopa-carbidopa intestinal gel (LCIG) is one of the best device-assisted therapies used in advanced-stage Parkinson's disease. The crucial complications of this treatment are rare and mostly due to percutaneous gastrostomy. This manuscript presents two rare catheter complications of percutaneous gastrostomy with levodopa-carbidopa intestinal gel therapy.

**Keywords:** *Advanced Stage Parkinson's Disease; LCIG; Device-Assisted Therapy*

### Introduction

Parkinson's disease (PD) is the second most common neurodegenerative disorder after Alzheimer's disease [1]. Measures of the prevalence of Parkinson's disease vary from approximately 0,3 per 100,000 in developed countries and the frequency increases with age except for genetic forms [2]. This slowly progressive disease usually has an insidious onset and affects the nigrostriatal pathway which includes dopaminergic neuron groups in the brain, especially in the substantia nigra pars compacta [3]. The symptoms of PD are bradykinesia, resting tremor, rigidity, and postural instability that respond to pharmacological treatment of levodopa. The definition of advanced-stage Parkinson's disease occurs due to complications that develop with a reduction in treatment response in advanced stages whereas an effective response is achieved in the early and middle stages with dopaminergic therapy [1,3]. The Delphi Expert Consensus Panel recommends the definition of advanced-stage PD when having '5-2-1 criteria (-> 5 oral levodopa use, ≥ 2 hours/day off symptom duration or ≥ 1 hour of severe dyskinesia) ≥ 1 [4]. The device-assisted treatments provide significant benefits in advanced-stage PD that are preferred in different options depending on many factors such as the patient's age, cognitive status, etc. Nowadays there are three options in common device-assisted therapies; levodopa-carbidopa gel infusion (LCIG), apomorphine pump, and deep brain stimulation (DBS) [5]. Levodopa-carbidopa intestinal gel is applied by percutaneous gastrojejunostomy (PEG-J) usually as a continuous 16 hours infusion after a morning bolus dose. The complications related to LCIG treatment have been reported at the rate of 13 - 70% and critical complications are rare and linked to the device and gastrostomy [6].

### Case Series

#### Patient 1

A 69-year-old female patient was diagnosed with PD in 2008 due to a resting tremor of the left upper extremity after ten years she was admitted to our movement disorders clinic because of the motor and non-motor fluctuations while taking the optimal oral therapy. She

had severe dyskinesias and unpredictable off periods. LCIG treatment was started by performing a percutaneous endoscopic jejunostomy (PEG-J) procedure. There were no complications during and after the procedure and also the patient’s motor and non-motor fluctuations greatly improved. A substantial improvement was observed in daily living activities, even so, the patient was admitted to the hospital due to intermittent obstructions during washing the jejunal tube, abdominal pain, and purulent discharge around the tube one year later. An abdominal computed tomography showed an increased density observed in the subcutaneous adipose tissue in the anterior abdominal wall around the peg catheter and a 7.3 mm collection area was detected in the superficial ultrasound. The bezoars were seen around the bumper of the percutaneous endoscopic jejunostomy tube which was not visible in esophagogastroduodenoscopy (EGD). The jejunal tube was extended into the jejunum but caused an ulcer at the incisura. The patient was followed up with oral treatments after the procedure, and after a while, the new tube was inserted.



Figure 1 and 2: Bezoars around the bumper of the patient EGD removal

**Patient 2**

A fifty-year-old male patient who was taking levodopa treatment and suffering from dyskinesias and unpredictable off periods applied to our movement disorders clinic with rest tremor of the left upper extremity which started nine years ago. LCIG treatment was started by performing a percutaneous endoscopic jejunostomy (PEG-J) procedure. Despite any complications during the procedure, one year later he had abdominal pain and obstructions during washing the jejunal tube and was admitted to the hospital. On EGD, it was observed that the jejunal catheter was located in the jejunum, but on withdrawing it into the stomach and the distal part was knotted on itself. The catheter was removed and a new catheter was placed through the previous PEG tube. The patient was discharged without any post-procedure complications.



Figure 3: The knotted distal end of the catheter seen on EGD.

### Discussion and Conclusion

It is known that 40 percent of the patients obtaining levodopa treatment for five years or longer have motor complications, therefore device-assisted treatment may be required. Although device-assisted therapies are ineffective for preventing the progression of the neurodegenerative process significantly improve the quality of life [7].

LCIG contains levodopa (20 mg/mL) and carbidopa (5 mg/ mL) suspension and directly reaches the jejunum by allowing levodopa to be absorbed continuously from the jejunum with gastric bypass [6,8]. Despite LCIG's success in treatment, the complications are also frequent and it is roughly estimated at 90% in some studies in the literature. LCIG complications are the most common gastrointestinal complications, depending on the device, abdominal pain, peritonitis, and duodenal ulcer are seen [8]. It was observed that twenty (90.9%) patients experienced adverse effects in a study which was conducted in our movement disorders clinic and included twenty-two patients who have covered LCIG treatment between December 2014 and March 2020, and three of twelve patients with complications related to PEG-J developed acute abdomens, endoscopy was performed in half of eight (36.4%) patients who developed complications related to the device, and seven devices were replaced [9].

When the first patient who was admitted to our clinic with abdominal pain and tube obstruction problems and found to bezoar in EGD was questioned, it was learned that the recommended traction movements were not optimal, and the patient was usually given fibrous nutrients. Impaired gastrointestinal motility and gastroparesis in Parkinson's patients may cause bezoar formation and, PEG-J can cause the bezoar by raising a core effect in the catheter. However, it is also known that fibrous nutrients are often recommended for Parkinson's patients for preventing effects of the reduced gastrointestinal motility. It may prompt a vicious circle whereas it may be an appropriate option to give high-fiber foods to patients with this, by mashing them sufficiently. Early intervention and withdrawal of the tube prevented the development of perforation and other serious complications [10].

The catheter knotting seen in our second patient is another complication and the distal part of the catheter placed in the jejunum is in the form of a braid. In patients with Parkinson's disease, the end of the catheter may become knotted around itself due to impaired gastrointestinal motility and pigtail structure [11].

Technically, proper positioning of the external pad during PEG-J insertion, leaving a gap of approximately one cm between the external pad and the skin during insertion prevents mechanical complications. The PEG-J system should be checked frequently after insertion to ensure that the tube is minimally mobile and not attached to the underlying deep tissue and the tube should be washed twice a day to keep it open [12].

Complications of levodopa-carbidopa related to bezoar and catheter knotting may not be as rare as considered. The bezoar complication of LCIG has been reported previously at least several times [6,13,14]. A recent study also showed that 13 among 60 patients had a total of 27 tube occlusions, and eight of them (61%) had altogether ten knots in the inner tube furthermore, concerning catheter knotting, at least three case reports of five patients with knotting of the inner tube have been published [15-18].

In addition to all these, the patient and patient relatives' compliance to the treatment of LCIG and home care after the procedure is also very important. At the initial stage of treatment, after inserting the tube through EGD, traction exercises should be performed on the catheter for some time and the tube should be washed daily. In the literature, there are side effects that cause 11% of patients due to inadequate care after the procedure [6].

As a result; in this article, we emphasized that LCIG has great positive effects in the treatment of advanced PD; nevertheless, complications associated with such as bezoar and catheter knotting should not be ignored.

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