

Complications of percutaneous endoscopic gastrostomy-jejunoscopy for levodopa/carbidopa infusion in advanced Parkinson's disease

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Abstract

Continuous infusions of levodopa directly into the duodenum-yejunum is an effective therapy to reduce daily off time in an advanced stage of Parkinson's disease, but it is not without complications, particularly device related problems. We present our experience in three Spanish hospitals with these complications, including a severe case with migration, several decubitus ulcers, and one case of perforation of the bowel and finally death.

Introduction

Parkinson's disease at an advanced stage determines motor fluctuations and dyskinesias that oral levodopa administration can no longer control. Recently, a novel gel form of levodopa/carbidopa has enabled pump infusion through percutaneous endoscopic gastrostomy (PEG) jejunoscopy directly into the duodenum. This method allows a continuous release of the drug, that results in less variability in levodopa concentrations, fewer motor fluctuations and dyskinesias.^{1,2} Duodopa[®] is the only formulation of levodopa and carbidopa which has been found to be suitable for continuous long-term intestinal infusion. The formulation consists of finely milled levodopa and carbidopa suspended in a carboxymethylcellulose and water gel. The gel is infused into the small intestine via PEG using a Duodopa portable pump and a permanent specially designed intestinal tube.

However adverse effects and mechanical

complications of the infusion device cannot be ignored.³⁻⁷ The aim of this paper is to discuss the four cases and give an estimated number of the severe complications in our country.

The number of PEG jejunoscopies placed in our hospitals was 17 with a rate of severe complications of 2/17 (11.7%) and a total number of complications of 4 out of 17 (22%).

Case Report #1

A 65-year-old male patient with Parkinson's disease at stage IV of Hoehn Yahr (motor fluctuations and dyskinesias) was proposed for the Duodopa[®] continuous infusion treatment. Jejunal tube (Freka Intest.CH9) (Solvay Pharma GmbH, Hannover, Germany) was placed through a percutaneous gastrostomy (Freka P.E.G CH) made two months earlier with no complications. Eight months after the system had been put in place, the patient was admitted with acute abdominal pain, vomiting and pump malfunction. He showed hypotension, distended and diffusely tender abdomen, leucocytosis, metabolic acidosis and oliguria. He was admitted to Intensive Care due to abdominal sepsis and hemodynamic instability. Plain abdominal X-ray showed mechanical small bowel obstruction and the distal end of the catheter at ileum level. Computed tomography (CT) scan showed that the catheter seemed to be included in the root of the mesentery, without pneumoperitoneo, and the intestinal loops were pleated around the axis of the catheter, whilst the distal end of the catheter was knotted (Figure 1).

An endoscopic examination revealed multiple longitudinal ulcerations along the axis of the tube in the duodenum and jejunum, with some of the ulcers revealing the muscular layer and the disappearance of the tube into the wall (Figure 2). The attempt to remove the tube with a polypectomy snare was unsuccessful because the tube was fixed to the mesentery. During the failed procedure of extraction, signs of pneumoperitoneum appeared and this led to immediate surgery which demonstrated multiple areas of intestinal perforation of 30 cm from the Treitz angle to Bawin's valve. The jejunal tube showed a knot in the distal end (Figure 3). Most of the perforations were sutured, although one intestinal loop needed to be resected (Figure 4). The patient died 2 days after surgery with a multisystem organ failure.

Case Report #2

A 74-year-old male patient under one-year therapy with Duodopa[®] infusion was admitted for epigastric pain and low dysphagia for solid

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Key words: percutaneous endoscopic gastrostomy-tube, levodopa/carbidopa infusion in duodenum, intestinal obstruction, intestinal perforation, endoscopic extraction.

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during the last month. The endoscopic study showed a large antro-pyloric ulcer due to decubitus from the jejunal tube (Figure 5). During the first unsuccessful tube extraction, the patient suffered hematemesis, acute anemia and hemodynamic instability. Fluids and blood transfusion were required in order to stabilize the patient and another gastroscopy revealed a big clot filling the gastric fundus and a big piloro-duodenal ulcer with a red clot on the surface (Forrest IIB). This was treated with endoscopic sclerosis. The patient was stable for 4 days and was transferred to our centre for PEG-J extraction.

Under general anesthesia a gastroscopy was performed; it showed a normal internal button of gastrostomy on the anterior gastric wall. The jejunal tube was inlaid in a big and deep longitudinal ulcer that covered incisura angularis, antrum, pylorus, bulb, second and third duodenal portion. The jejunoscopy tube was pulled out through the stomach with external traction from outside of the abdominal wall and with the help of endoscopic foreign body forceps. The pig-tail ending of the tube was clogged with a bezoar. The jejunoscopy tube was cut and endoscopically withdrawn altogether with the gastrostomy button. The patient remained asymptomatic with no complications.

Case Report #3

A 74-year-old female with Parkinson's disease at stage IV of Hoehn Yahr was proposed for Duodopa therapy due to suboptimal control of the illness with oral treatment. A jejunal tube was placed through gastrostomy (9 Fr) without any immediate problem. Three months later

the patient was admitted to the Emergency Department due to malfunction of the system. An endoscopy, which revealed the knotting of the distal part of the tube in the gastric cavity, was carried out. It was necessary to remove the inner tube through endoscopic control because the removal of the tube through the stoma was unsuccessful. (Figure 6).

Case Report #4

A 73-year-old male with advanced Parkinson's disease (stage IV of Hoehn-Yahr) was admitted to the Neurology ward for Duodopa therapy following the previous placement of a PEG jejunostomy (15 Fr). Four months later the patient was transferred to our centre because of a gastrostomy tube, loose inside the stomach. The gastroscopy showed the gastrostomy tube inside the gastric cavity with the internal button in duodenal bulb. The infusion system was removed and was replaced with a new one.

Discussion

The majority of published articles on Duodopa therapy discusses little about the possible adverse effects. However these can be very important actually. The complications can be classified into: those related with gastrostomy or PEG jejunostomy⁸⁻¹⁰ (granulomas, abdominal pain, peristomal wound leakage, hemorrhage), those with drugs² (hallucination, dyskinesias, confusion) or complications with the infusion technique³⁻⁸ (displacement, decubitus ulcers, knotting).

In our experience the rate of severe complications is 11,7% and the rate of dysfunctions of the tube is 23,5%, which is very high. In our first case the spontaneous knot of the tube probably played a significant pathophysiological role. The main mechanism of the patient's evolution might have been the knotting and secondary migration of the distal end of the jejunostomy tube due to the intestinal peristalsis. As a consequence of the fixed tube at the gastrostomy port and the progressive migration of the tube, the intestinal loops were crammed and pleated along the tube, which produced multiple deep decubitus ulcers and several covered perforations that later on would lead to small bowel obstruction. Previous literature on Duodopa[®] reports only four cases of tube knotting, three cases with enteral nutrition tube³⁻⁵ and one case related to the infusion method,⁶ although none of them presented severe complications.

The second case, as well as the first, demonstrated decubitus gastric ulcers with

significant upper gastrointestinal bleeding. However, it was possible to stop the ulcers bleeding using the endoscopy and afterwards the jejunostomy tube has been successfully removed before a perforation happened. The other two cases outlined milder complications of jejunostomy tube requiring early endoscopic intervention, such as knotting and dislodgement.

It is not clear yet the effect that treatment with Duodopa[®] has in the intestinal peristalsis and the development of these side effects. Perhaps it would be necessary in the future to

follow-up patients periodically with abdominal X-ray studies in order to detect early knotting of the tube and to be aware of every unexplained malfunctioning of PEG-tube system. In such a case we could immediately check its position and discard any kind of kinking or mispositioning of the tube.

It is known that PEG jejunostomy dislodgement back into the stomach leads to the reappearance of fluctuating effects of the medication and therefore it is essential to move the tube into the proper position (in the distal duodenum) with or without tube replacement.



Figure 1. Computed tomography shows pleated and volvulated intestinal loops around the catheter with knotting in the terminal ileum.

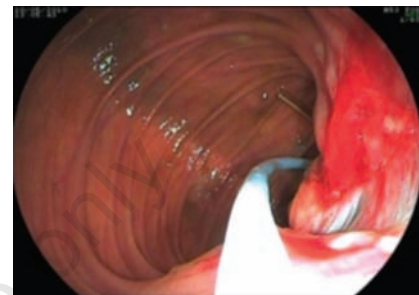


Figure 2. Deep longitudinal ulceration.



Figure 3. Jejunal tube with knot in distal end.

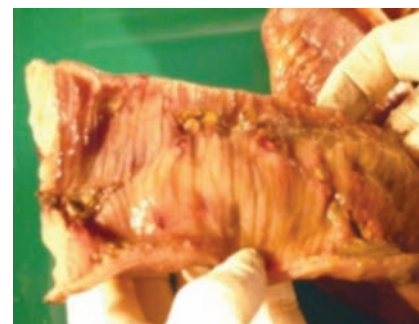


Figure 4. Intestinal loop with multiple perforations.

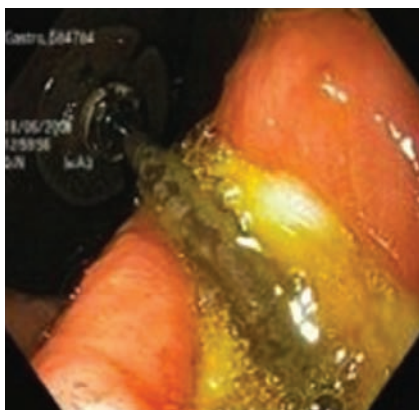


Figure 5. Jejunal tube inlaid in gastric mucosa.



Figure 6. Tube knotting near the gastrostomy stoma.

Firstly we verify the tube location by X-ray and then, if it is misplaced, we should remove the tube by pulling it back from the gastrostomy port, outside the abdominal wall. If this fails, upper endoscopy withdrawal should be tried after cutting the tube at the gastrostomy port and later on new Duodopa® delivery system should be placed.

In the event of the impossibility of removing the jejunostomy tube because of the migration or knotting in the distal end, or because the tube is completely fixed at the ulcers tissue, perhaps a retrograde endoscopic removal could be tried. Surgery will be the last option in order to extract the jejunostomy tube after being cut at the gastrostomy port. In the first case the attempts for endoscopy removal were unsuccessful, and were followed by an overt perforation which required immediately surgery.

Therefore we need to be aware of these kinds of severe complications in order to prevent and to treat them appropriately when they occur.

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