

Research Article,

## Peptic Esophageal Stricture in a Patient with Parkinson's disease

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### Abstract:

Benign esophageal strictures are uncommon and their management remains challenging. Herein, we present a rare both functional and organic esophageal stricture in a patient with Parkinson's disease and reflux esophagitis. The patient was diagnosed with severe complex stricture in the distal part of the esophagus, requiring surgical treatment. We performed subtotal esophageal resection and Ivor-Lewis gastroesophagoplasty. The successful management of antiparkinsonian drug therapy with adequate parenteral substitution in the early postoperative period is of great importance to avoid any further complications.

**Key words:** Benign stricture; Parkinson's disease; esophageal resection; Gastroesophagoplasty

### Introduction:

Various malignant and benign conditions lead to the development of esophageal strictures, including neoplasms, reflux esophagitis, achalasia, diffuse esophageal spasm, nutcracker esophagus, esophageal web and postoperative anastomotic stricture. The incidence of benign strictures is low. Gastroesophageal reflux disease (GERD) is one of the most common gastrointestinal disorders worldwide. If left unrecognized and untreated properly with antacids as a first-choice medication, GERD might be complicated with esophagitis, extensive erosions, ulcerations, bleeding, narrowing of the esophagus, peptic strictures, Barrett's esophagus and esophageal adenocarcinoma. The management of patients with benign esophageal stricture is time-consuming and challenging. Nowadays, benign strictures are treated by step-up approach, using endoscopic techniques, steroid injection, incisional therapy or stenting, depending on their complexity. In rare, refractory to dilatation or long-segment stenosis cases, surgery is

performed as a last-resort treatment option [1-7].

Herein, we report a case of a rare benign esophageal stricture in a patient with Parkinson's disease, treated with subtotal esophageal resection and Ivor-Lewis gastroesophagoplasty.

### Case report:

A 62-years-old man diagnosed with Parkinson disease for 8 years and treated with levodopa complained of dysphagia for liquid and solid food and weight loss of 10 kg for the last six months. No PPI intake was reported. No laboratory abnormalities were found. The patient was consulted in Department of gastroenterology and underwent upper endoscopy. During the esophagogastroduodenoscopy (Figure 1) we observed a stricture with severe narrowed diameter and contact bleeding, beginning 36 cm from the incisor teeth and, making it impossible to pass the endoscope through the esophagus. We took biopsies, which were with no histological signs of malignancy.



Figure 1. Esophagogastroduodenoscopy



Figure 3. Gastric graft

We performed a computer tomography as well (Figure 2).



Figure 2. Computer tomography imaging

We performed a duodenum mobilization by Kocher and Heineke-Mikulicz pyloroplasty, followed by subtotal resection of the esophagus about 3 cm above the level of the azigos vein and an intrathoracic termino-lateral esophagogastrostomy by Ivor – Lewis (Figure 4).



Figure 4. Intrathoracic termino-lateral esophagogastrostomy by Ivor – Lewis

In the distal part of the esophagus was visualized complex stricture approximately 90 mm long with a circular irregular thickening of the wall of the esophagus up to 12 mm and a relative narrowing of the lumen. The pathologically altered area passes the taken orally water-soluble contrast. The lumen of the esophagus was proximally dilated. Only one paraesophageal lymph node had a size of up to 12 mm. The stenotic portion of the esophagus slightly compressed the dorsal wall of the left atrium, with no signs of infiltration. As endoscopic treatment of the stricture was technically not possible, the patient was considered for surgical treatment. A few days before the surgery, the patient started treatment with transdermal rotigotine, which continued to be applied during the fasting postoperative period. Using synchronous upper median laparotomy and right lateral thoracotomy the thoracic esophagus was mobilized after incision of massive periesophageal adhesions in the posterior mediastinum to the pericardium, ligamentum pulmonale, contralateral pleura and lower lobe of the right lung. A gastric tube of a right gastroepiploic artery feeding vessel was formed (Figure 3).

Macroscopically we observed a severe transmural panesophagitis with whitish stricture in the distal part, a crater-like bottom and polypoidly enlarged mucosa to the cardia (Figure 5).



Figure 5. Macroscopic findings, a long segment of circumferential thickening of the esophageal wall.

Histologically was diagnosed Barrett's esophagitis with incomplete regeneration and metaplasia of the gastric mucosa. 26 carinal and paraesophageal lymph nodes were evaluated with chronic nonspecific lymphadenitis findings. On the 4th postoperative day, fever up to 38.9 appeared due to pneumonic infiltrate in the left basal segment, which was treated successfully with antibiotic therapy (Figure 6).



Figure 6. Pneumonic infiltrate in the left basal segment

From the 5th postoperative day, the patient received levodopa tablets through the nasogastric tube, which was localized in the descending part of the duodenum intraoperatively. The patient was discharged on the 13th postoperative day with a PPI therapy. 6 months later he had no complaints and no endoscopic signs of reflux disease.

### Discussion:

Benign esophageal strictures are not common. They are classified into functional and organic strictures [3]. A study reported eight times higher risk of stricture in patients with esophagitis [8]. Gastroesophageal reflux disease (GERD) remains one of the most common gastrointestinal disorders [1]. Proton pump inhibitors (PPIs) are the first-line treatment of choice of GERD, leading to significantly decreased gastric acid secretion by inactivation of the H<sup>+</sup>/K<sup>+</sup>-adenosine triphosphatase enzyme located on the apical membrane of the gastric parietal cell. PPIs have well established effectiveness and safety and have significantly reduced the incidence of clinical manifestations and complications of GERD [1, 9]. Benign peptic strictures of the esophagus are serious complications of GERD and occur in 7-23% of cases [9-12]. They are usually short segments located in the lower third of the esophagus, accompanied often by a hiatal hernia and shortening of the esophagus. Fibrosis can be spread from the submucosa through the entire esophageal wall to the

periesophageal connective tissue, causing esophageal shortening [9]. Benign strictures are associated with dysphagia, malnutrition, weight loss and aspiration and have high relapse rate [3, 9]. In our case we presented a rare combination of both organic and functional components in the development of esophageal stricture – reflux esophagitis and oesophageal muscular dysfunctions due to Parkinson's disease (PD). PD is one of the most common progressive degenerative disorders of the central nervous system involving both motor and nonmotor symptoms [13-15]. In nearly 60-80% of the patients with PD are reported gastrointestinal (GI) disorders due to autonomic dysfunction with altered motility [14]. All whole GI tract can be affected in each disease stage. Studies suggest the presence of Lewy bodies in the extra central nervous system in Meissner's and Auerbach's plexuses, including in the lower esophagus, are involved in the pathogenetic mechanisms of GI symptoms in PD [15]. GI symptoms in PD are associated with difficult management, complications and impaired quality of life. Constipation, hypersalivation, dysphagia, and nausea are the most often GI symptoms [14]. They are usually observed in older patient, in advanced stages of PD and by levodopa treatment, which was also the case in our patient [14]. Dysphagia is a frequent phenomenon during all PD stages and is caused by oral, pharyngeal, and / or oesophageal muscular dysfunctions by swallowing. The observed complete aperistalsis, lower esophageal sphincter spasms, impaired oesophageal transit, and deficit in sphincter relaxation and pressure lead not only to dysphagia but also to gastroesophageal reflux [14, 16]. In a study of Maeda et al. the presence of PD was associated with 4.1 times higher prevalence of GERD compared to the age-matched controls [15]. The lack of early symptoms of GERD in our patient such as heart burn, regurgitation or epigastric pain caused delayed diagnosis of GERD with no in a timely PPIs intake to reduce the risk of strictures development. However, if present, peptic strictures can be successfully treated in more than 80-90% of cases by endoscopic dilation (balloons or bougies), steroid injection, incisional therapy or stenting. Resection is a last treatment option in rare cases of failure to resolve or rapid recurrence after dilatation usually in complex strictures above 2 cm, angulated, irregular or with a very narrowed diameter and due to higher risk of complications [2-4, 17-19]. Our patient was diagnosed in late stage of GERD with long complex stricture and severely narrowed diameter, not allowing any endoscopic



treatment. Therefore, surgery was our treatment of choice. In cases of intractable strictures, when antireflux surgery procedure is not possible, esophageal resection with gastric, intestinal or colonic reconstructions are performed [3]. According to Altorki et al, non-dilated strictures in younger patients with expected long-term survival are indicated for esophageal resection [20]. They prefer the reconstruction of the esophagus by interposition of the colon or the stomach as a second option. If possible, we prefer gastric reconstruction as well as in this case. Additional challenge in this case was the management of PD treatment during the complete fasting early postoperative period, when the duodenal absorption of levodopa is impaired. The patient received adequate parenteral substitution of his oral antiparkinsonian drug therapy by applying transdermal rotigotine, avoiding any worsening of PD symptoms, hyperpyrexia syndrome or akinetic crisis.

### Conclusion:

GERD is one of the most common GI disorders, leading to local complications if not treated properly. Patients with Parkinson's disease are at increased risk of GERD development and endoscopic monitoring might be beneficial for their management. We demonstrated a severe esophageal stricture with complex pathogenesis as a complication of GERD in a patient with Parkinson's disease. The multidisciplinary experienced team ensured the accurate diagnostic approach, successful surgical treatment and the uncomplicated postoperative period.

### References:

- [1.] Medical management of gastroesophageal reflux disease. Robert C. Lowe, M.D.
- [2.] Yankov G, Yamakova Y, Vladimirov B, Petkov R, Mekov E, Ilieva V, Yanev N, Petrov D. Spontaneous perforation of a malignified corrosive stricture of the esophagus and subsequent perforation of a giant duodenal stress ulcer. *Acta Medica Bulgarica* 2020; 47(1):60-63. DOI: <https://doi.org/10.2478/amb-2020-0010>
- [3.] Yamasaki, Y., Ozawa, S., Oguma, J. et al. Long peptic strictures of the esophagus due to reflux esophagitis: a case report. *Surg case rep* 2, 64 (2016). <https://doi.org/10.1186/s40792-016-0190-1>
- [4.] Everett, S. M. (2019). Endoscopic management of refractory benign oesophageal strictures. *Therapeutic Advances in Gastrointestinal Endoscopy*. <https://doi.org/10.1177/2631774519862134>
- [5.] Yankov G, Mekov E, Kovacheva M, Vladimirov B, Petkov R. A case of a giant epiphrenic esophageal diverticulum. *Acta Medica Bulgarica* 2020;47(1):56-59. DOI: <https://doi.org/10.2478/amb-2020-0009>
- [6.] Clarrett DM, Hachem C. Gastroesophageal Reflux Disease (GERD). *Mo Med*. 2018; 115(3):214- 218.
- [7.] Yankov G, T. Mihalova, R. Petkov, E. Mekov, S. Yankova, D. Petrov. Bardet-Biedl syndrome with a kidney transplant, esophageal adenocarcinoma and postoperative complication. *Hindawi Case reports in Surgery*, Volume 2019, Article ID 8983174, 4 pages <https://doi.org/10.1155/2019/8983174>.
- [8.] Hvid-Jensen F, Pedersen L, Munk EM, Drewes AM, Funch-Jensen P. Long-term complications to reflux disease in community practice. A 17-year cohort study of 4706 patients. *Scand J Gastroenterol*. 2011; 46:1179–86.
- [9.] Kuo WH, Kalloo AN. Reflux strictures of the esophagus. *Gastrointest Endosc Clin N Am*. 1998;8:273–281
- [10.] Braghetto I, Csendes A, Burdiles P, Korn O, Compan A, Guerra JF. Barret's oesophagus complicated with stricture: correlation between classification and the results of the different therapeutic options. *World J Surg* 2002; 26(10):1228-33.
- [11.] Richter JE. Severe reflux esophagitis. *Gastrointest Endosc Clin N Am*. 1994; 4(4):677-697.
- [12.] Specler SJ, Sperber H, Doos WG, Shimmel EM, The prevalence of Barret's esophagus in patients with chronic peptic esophageal strictures. *Dig Dis Sci* 1983; 28(9):769-774.
- [13.] Suttrup I, Suttrup J, Suntrup-Krueger S, et al. Esophageal dysfunction in different stages of Parkinson's disease. *Neurogastroenterol Motil*. 2017; 29(1):10.1111/nmo.12915. doi:10.1111/nmo.12915
- [14.] *Gastrointestinal Dysfunctions in Parkinson's disease: Symptoms and Treatments*. Andrée-Anne Poirier
- [15.] Maeda T, Nagata K, Satoh Y, Yamazaki T, Takano D. High prevalence of

gastroesophageal reflux disease in Parkinson's disease: a questionnaire-based study. *Parkinsons Dis.* 2013; 2013:742128. doi:10.1155/2013/742128

- [16.] R. F. Pfeiffer, "Gastrointestinal dysfunction in Parkinson's disease," *The Lancet Neurology*, vol. 2, no. 2, pp. 107–116, 2003.
- [17.] Van Boeckel PG, Siersema PD. Refractory esophageal strictures: what to do when dilation fails. *Curr Treat Options Gastroenterol.* 2015; 13(1):47- 58. doi:10.1007/s11938-014-0043-6
- [18.] Henderson RD, Henderson RF, Marrayatt GV, Surgical management of 100 consecutive esophageal strictures. *Journal of Cardiovascular Surgery*, 1999:99, 1-7.
- [19.] Yankov G, Mekov E, Kovacheva M, Vladimirov B, Petkov R. Diaphragmatic hernia after transthoracic esophagectomy. *The American Surgeon* 2020, 86(3):e136-e138(3)
- [20.] Altorki NK, Skinner DB, Segalin A, Stephens JK, Ferguson MK, Little AG. Indications for esophagectomy in nonmalignant Barrett's esophagus. *Ann Thorac Surg.* 1990; 49(5):724-726.