

Pylorus-Directed Therapy for Gastroparesis Using EsoFLIP

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Introduction

Gastroparesis is a debilitating disease characterized by delayed gastric emptying. It is more prevalent in patients with T1DM than T2DM with studies showing prevalence of 5% and 1%, respectively.

Historically, the suggested pathophysiology includes sympathetic vagal neuropathy, Cajal interstitial cell abnormalities, loss of neuronal nitric oxide synthase (nNOS), and poor glycemic control.

A novel endoscopic therapy has recently been described using EndoFLIP with possible implications for treating pyloric dysfunction associated with gastroparesis



Figure 1. A, EsoFLIP provides real-time assessment of the pylorus during the procedure. B, Measurement catheter has an integrated pressure sensor for balloon pressure measurement. C, Balloon catheter to dilate the GEJ

Image taken from: <https://www.medtronic.com/covidien/en-us/products/motility-testing/endoflip-impedance-planimetry-system.html>

Case Presentation

We present a case of a 34 year-old man with pmh T2DM who presented with acute abdominal pain, nausea, and vomiting. Vitals on admission were hemodynamically stable. Exam was unremarkable.

CT abdomen/pelvis without contrast showed moderate colonic stool, no acute process. Labs remarkable for K 4.3 HCO₃ 20 BUN 25 Cr 1.5 blood glucose 490 anion gap (AG) of 19 WBC 13.04

A diagnosis of hyperglycemic hyperosmolar syndrome was made. He was started on IV insulin drip, IVF, Ondansetron, Promethazine, Metoclopramide. His HHS resolved and his lab values normalized. However, he continued to have nausea, vomiting, and was unable to tolerate any oral intake.

We then proceeded with upper endoscopy using EsoFLIP

Case Presentation (continued)

The catheter was placed side-by-side the endoscope and under direct visualization was advanced past the pylorus. Proper balloon placement was verified by an hourglass shape of the balloon displayed on the monitor.

Measurements were obtained of the cross-sectional area of the pylorus at various balloon volumes starting at 30 ml. The balloon was inflated stepwise at 5 ml intervals and measurements obtained.

The initial pylorus diameter was measured to be 13.7 mm. The pylorus was dilated up to the target diameter of 25mm. Mucosal tears were seen after the balloon was deflated.

The patient tolerated the procedure well without any immediate complication. His symptoms resolved and he was able to tolerate a regular diet.

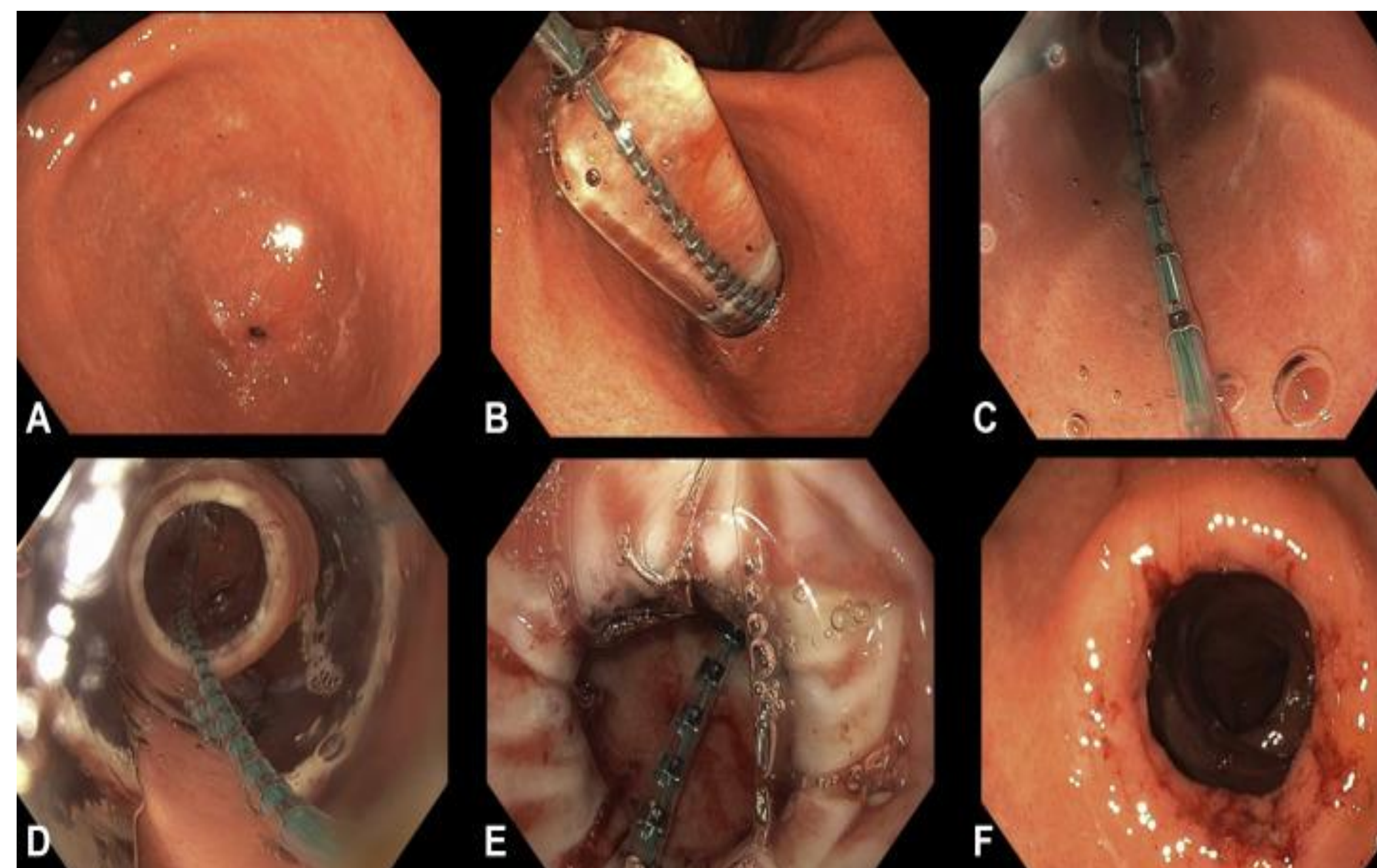


Figure 2. Endoscopic procedure. A and F, Pylorus pre-/postdilation. B, Esophageal functional luminal imaging probe catheter placed in the pylorus with the initial volume of 30 mL. C-E, Visualization of the circular pyloric muscle during dilation by pressing the camera into the proximal balloon.

Images taken from: Murray FR, Schindler V, Hente JM, et al. Pyloric dilation with the esophageal functional lumen imaging probe in gastroparesis improves gastric emptying, pyloric distensibility, and symptoms. *Gastrointestinal Endoscopy*. Sept 2021; 94(3):486-494.

Discussion

It has been thought gastroparesis occurs primarily as a function of sympathetic vagal neuropathy and loss of Cajal interstitial cell abnormalities. Recent research suggests pyloric sphincter dysfunction plays a significant role.

Endoscopic-guided pneumatic dilation has traditionally been used in achalasia to dilate the lower esophageal sphincter (LES). In this case, the clinical response from pneumatic dilation of the pyloric sphincter illustrates the potential of EsoFLIP as a therapeutic option for refractory gastroparesis. Using this as an additional therapeutic modality may revamp current medical management for diabetic gastroparesis.

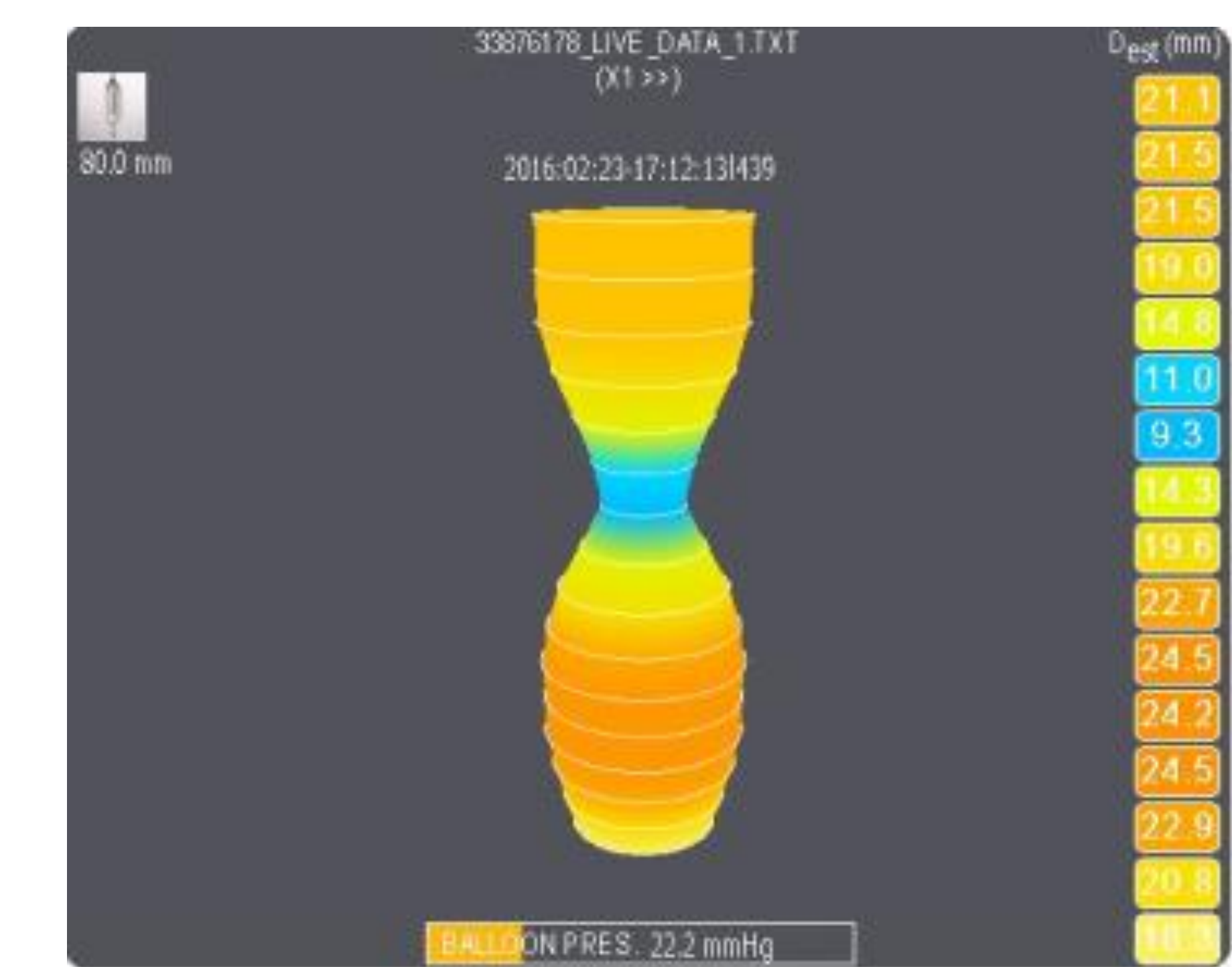


Figure 3 shows sample displays of the recordings with inflation of the impedance planimetry system. This image shows the pylorus at 40 cc balloon volume distention. Image taken from: Saadi, M, Yu, D, Malik, Z, et al. Pyloric sphincter characteristics using EndoFLIP in gastroparesis. *Revista de Gastroenterologia de Mexico*. Dec 2018. 83 (4); 375-384

References

1. Murray FR, Schindler V, Hente JM, et al. Pyloric dilation with the esophageal functional lumen imaging probe in gastroparesis improves gastric emptying, pyloric distensibility, and symptoms. *Gastrointestinal Endoscopy*. Sept 2021; 94(3):486-494. doi:10.1016/j.gie.2021.03.022
2. Shanker A, Bashashati, M. Measurement of pyloric pressures in gastroparesis: stiff competition from EndoFLIP. *Digestive Diseases and Sciences*. Sept 2021; 66:2475-2477. doi:10.1007/s10620-020-06603-w