



Effects of Surgical Pyloroplasty on Pyloric EndoFLIP Measurements and Gastric Emptying in Patients with Refractory Gastroparesis and Identification of Pyloric Sphincter Smooth Muscle Pathology

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Introduction

- Gastroparesis (GP) is defined as delayed gastric emptying in the absence of mechanical obstruction.
- While medical therapies of GP are the first step. 30% or more of patients may require surgical or endoscopic interventions if GP is refractory to medications.
- EndoFLIP (Endoluminal Functional Lumen Imaging Probe) provides real-time measurements of cross-sectional area, pressure, and distensibility of various gastrointestinal (GI) sites.
- However, there have been limited applications to the pyloric sphincter (PS).
- Our study investigated
 - (1) The effects of surgical pyloroplasty (PP) on EndoFLIP and gastric emptying (GE) outcomes.
 - (2) Whether there is PS pathology by comparing the number of interstitial cells of Cajal (ICC) between GP and control patients.

Methods

- Eight patients with refractory GP (mean age: 50.5) failing medical therapies underwent laparoscopic robotic PP accompanied by gastric stimulator placement.
- Pyloric EndoFLIP was performed before and after PP at an inflated volume of 50mL of saline.
- A scintigraphic gastric emptying assessment was performed before and during follow-up to assess changes in GE.
- At surgery, pyloric biopsies were obtained from these refractory GP patients and compared to eight controls (non-GP autopsy specimens) regarding the number of ICC present per high power field (HPF). A T-test was used for the comparisons.

Figures

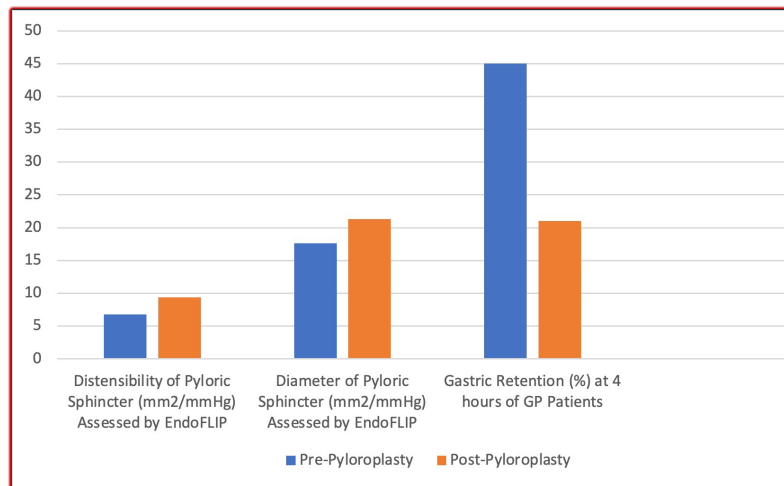


Figure 1: Comparison of distensibility, diameter and gastric retention in pre- and post-pyloroplasty patients

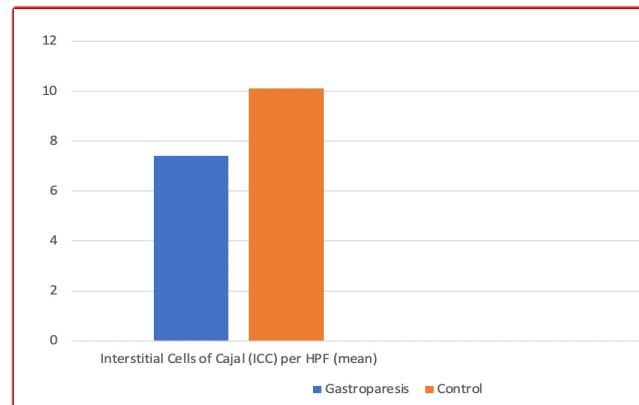


Figure 2: Comparison of the mean ICC between gastroparesis and control patients

Results

- Pre-PP pyloric distensibility and diameter at 50mL were 6.79 mm²/mmHg and 17.6 mm²/mmHg, respectively (Figure 1).
- Mean pre-PP gastric retention of an isotope-labeled meal of 45% at 4 hours.
- Pyloric distensibility post-PP improved to 9.4 mm²/mmHg (p=0.28) with a significant pyloric diameter increase to 21.3 mm²/mmHg (p=0.05) (Figure 1).
- After PP, mean GE was 53% faster at 4 hours with gastric retention of 21% compared to the baseline (Figure 1).
- PS biopsy in GP patients had a mean ICC of 7.41 per HPF, which was 36% lower than the ICC mean of 10.1 per HPF (p=0.09) present in the controls (Figure 2).

Discussion

- Pyloric EndoFLIP is an important new modality providing real-time data about the effectiveness of PP in medication refractory GP patients.
- Our EndoFLIP findings indicate a significant improvement of diameter post-PP accompanied by a marked acceleration of GE.
- There is pathology of the pyloric smooth muscle in GP as shown by a reduction in the number of ICC compared to controls.