Foregut Surgeons Trust Manometry, but will Patients Follow Through?

Authors: Brian Dessify D.O., Gabriel Mekel M.D., Voranaddha Vacharathit M.D., Alexandra Falvo M.D., Shengxuan Wang, Steven Medeiros M.D, Saran Kunaprayoon, Mustapha Daouadi, M.D., Jon Gabrielsen M.D.,, David Parker M.D., Anthony Petrick M.D.
Geisinger Medical Center, Danville, PA

Geisinger

Introduction

High resolution manometry studies are the most sensitive technique to diagnose esophageal motility disorders. Due to this technological advancement surgeons are able to assess various esophageal motility disorders in patients with complaints of foregut pathology. The results of this study can aid in preoperative planning in foregut patients.

However, patients remain apprehensive about the discomfort associated with manometric catheters. Many patient's experience significant choking, coughing, and pharyngeal discomfort that prevents successful completion of the study. This raises some concern regarding the surgical care of these patients. However, there have been some studies that demonstrate no significant changes in outcomes between completion of manometry and type of fundoplication performed[3]. Boris Zevin MD et al showed equivalent postoperative outcomes in foregut patients regardless of manometry completion[3]. Therefore, the objective of this study was to identify the rate at which patients complete manometric studies followed by type of surgery performed.

Methods and materials

We retrospectively reviewed all manometry orders placed in the Geisinger Health System from May 2018 to May 2020. The study was approved by our Institutional Review Board (IRB) for a retrospective chart review using the CPT code 91010 for manometry.

Upon review of the charts we looked to determine how often patients had successfully completed their manometry study that was ordered. Continuous variables were assessed with Kruskal-Wallis test and categorical variables were assessed with Chi-square test.

Table 1	No N= 55 (12.4%)	Yes N= 388 (87.6%)	Total N=443	P-value
Age, Median	58.0	60.5	60.0	0.5801[1]
Sex, n (%) Female Male	 36 (65.5%) 19 (34.5%)	 265 (68.3%) 123 (31.7%)	 301 (67.9%) 142 (32.1%)	0.6723[2]
BMI Median	29	29	29	0.5872[1]
Asthma, n (%) No Yes	 42 (76.4%) 13 (23.6%)	 316 (81.4%) 72 (18.6%)	 358 (80.8%) 85 (19.2%)	0.3706[2]
Obstructive Sleep Apnea, n (%) No Yes	 31 (56.4%) 24 (43.6%)	 225 (58.0%) 163 (42.0%)	 256 (57.8%) 187 (42.2%)	0.8193[2]
GERD, n (%) No Yes	 20 (36.4%) 35 (63.6%)	 99 (25.5%) 289 (74.5%)	 119 (26.9%) 324 (73.1%)	0.0894[2]
Laryngopharyngeal reflux, n (%) No Yes	 23 (41.8%) 32 (58.2%)	 114 (29.4%) 274 (70.6%)	 137 (30.9%) 306 (69.1%)	0.0618[2]
History of surgery, n (%) No Yes	 29 (52.7%) 26 (47.3%)	 206 (53.1%) 182 (46.9%)	 235 (53.0%) 208 (47%)	0.9595[2]

Table 1. Demographics of patients who had the manometry test scheduled or not. [1]Kruskal-Wallis p-value; [2]Chi-Square p-value.

Table 2	Not done N= 36	Completed N= 325	Failed N=27	Total N =388	P-value
Age, Median	61.0	60.0	63.0	60.5	0.9419[1]
Sex, n (%) Female Male	 24 (66.7%) 12 (33.3%)	 220 (67.7%) 105 (32.3%)	 21 (77.8%) 6 (22.2%)	 265 (68.3%) 123 (31.7%)	0.5434[2]
BMI Median	27.2	29.0	27.7	28.6	0.6620[1]
Asthma, n (%) No Yes	 25 (69.4%) 11 (30.6%)	 268 (82.5%) 57 (17.5%)	 23 (85.2%) 4 (14.8%)	 316 (81.4%) 72 (18.6%)	0.1421[2]
Obstructive Sleep Apnea, n (%) No Yes	 14 (38.9%) 22 (61.1%)	 192 (59.1%) 133 (40.9%)	 19 (70.4%) 8 (29.6%)	 225 (58.0%) 163 (42.0%)	0.0267[2]
GERD, (%) No Yes	 9 (25.0%) 27 (75.0%)	 87 (26.8%) 238 (73.2%)	 3 (11.1%) 24 (88.9%)	 99 (25.5%) 289 (74.5%)	0.1997[2]
Laryngopharyngeal reflux, n (%) No Yes	 9 (25%) 27 (75.0%)	 102 (31.4%) 223 (68.6%)	 3 (11.1%) 24 (88.9%)	 114 (29.4%) 274 (70.6%)	0.0705[2]
History of surgery, n (%) No Yes	 15 (41.7%) 21 (58.3%)	 179 (55.1%) 146 (44.9%)	 12 (44.4%) 15 (55.6%)	 206 (53.1%) 182 (46.9%)	0.2007[2]

Table 2. Demographics of patients who did or did not complete the manometry study. [1]Kruskal-Wallis p-value; [2]Chi-Square p-value.

Results

A total of 443 patients had manometry studies **ordered** and 388 (87.6%) of those patients had a test **scheduled.** Of those with manometry studies scheduled, 325 (83.7%) patients completed the test successfully, 36 (9.27%) did not complete the study, and 27 (6.95%) had failed. Patients who competed the study had a high rate of gastroesophageal reflux disease (238 73.2%) and laryngopharyngeal reflux (223 68.6%). Of those who failed only 3 were referred for a repeat manometry study while 5 went on to impedance testing.

Of the 388 patients who had the manometry test scheduled, 120 patients went on to have surgery with 14 of them not having manometry results. Of the 120 surgical patients, the most common complaint was gastroesophageal reflux disease 109 (90.8%) or laryngopharyngeal reflux 106 (88.3%). The most frequent surgery performed was a Nissen fundoplication (51%) followed by a Toupet or Dor fundoplication (28%).

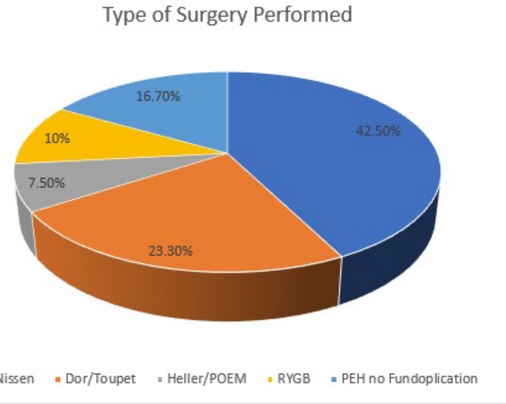


Table 3	No N= 267	Yes N= 120	Total N=387	P-value
Age, Median	61.0	60.5	61.0	0.5498[1]
Sex, n (%) Female Male	 171 (64.0%) 96 (36.0%)	 93 (77.5%) 27 (22.5%)	 264 (68.2%) 123 (31.8%)	0.0086[2]
BMI Median	28.9	28.1	28.5	0.1014[1]
Asthma, n (%) No Yes	 219 (82.0%) 48 (18.0%)	 96 (80.0%) 24 (20.0%)	 315 (81.4%) 72 (18.6%)	0.6363[2]
Obstructive Sleep Apnea, n (%) No Yes	 147 (55.1%) 120 (44.9%)	 77 (64.2%) 43 (35.8%)	 224 (57.9%) 163 (42.1%)	0.0932[2]
GERD, n (%) No Yes	 87 (32.6%) 180 (67.4%)	 11 (9.2%) 109 (90.8%)	 98 (25.3%) 289 (74.7%)	0.0001[2]
Laryngopharyngeal reflux, n (%) No Yes	 99 (37.1%) 168 (62.9%)	 14 (11.7%) 106 (88.3%)	 113 (29.2%) 306 (69.1%)	0.0001[2]
History of surgery, n (%) No Yes	 136 (50.9%) 131 (49.1%)	 69 (57.5%) 51 (42.5%)	 205 (53.0%) 182 (47.0%)	0.2315[2]

Table 3. Demographics of patients who had surgery performed or not. [1]Kruskal-Wallis p-value; [2]Chi-Square p-value.

Conclusion

Manometry is a valuable tool to assess esophageal function. However, without successful competition of manometry patients can still undergo foregut surgery with good outcomes. Matthew D'Alessio MD demonstrated that patients who clear the bolus of contrast during esophagography have good functional outcomes after Nissen fundoplication regardless of esophageal dysmotility found on manometry[2].

Esophageal manometry is a valuable tool when assessing patients with dysmotility disorders as it can impact surgical decision making. In fact, studies have demonstrated routine use use of manometry and pH impedance studies is not required and can be cost effective in the care of foregut patients[1].

References

1. **Frantzides CT, Carlson MA, Madan AK, Stewart ET, Smith C. Selective use of esophageal manometry and 24-Hour pH monitoring before laparoscopic fundoplication. J Am Coll Surg. 2003 Sep;197(3):358-63; discussion 363-4. doi: 10.1016/S1072-7515(03)00591-X. PMID: 12946787.**
2. **D'Alessio MJ, Rakita S, Bloomston M, Chambers CM, Zervos EE, Goldin SB, Poklepovic J, Boyce HW, Rosemurgy AS. Esophagography predicts favorable outcomes after laparoscopic Nissen fundoplication for patients with esophageal dysmotility. J Am Coll Surg. 2005 Sep;201(3):335-42. doi: 10.1016/j.jamcollsurg.2005.04.036. PMID: 16125065.**
3. **Zevin B, Jones EL, Martin Del Campo SE, Perry KA. Omission of preoperative esophageal manometry does not alter operative approach or postoperative dysphagia following laparoscopic paraesophageal hernia repair. Dis Esophagus. 2017 Jul 1;30(7):1-6. doi: 10.1093/dote/dox044. PMID: 30052900.**