The Utility of pH Studies After Anti-Reflux Surgery

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Background

Wireless esophageal pH monitoring is the preeminent diagnostic tool for the assessment of esophageal acid exposure in correlation with symptoms with reflux episodes.

No guidelines exist regarding the clinical utility of pH studies in the postoperative setting. This study aims to determine its utility in the management of GERD patients.

Methods

Retrospective review of a prospectively maintained gastroesophageal database

All patients undergoing Toupet and Nissen fundoplication, or magnetic sphincter augmentation (MSA), and returning for their 1-year postoperative pH study were included.

Statistical analysis:
Chi-square test and Spearman's correlation coefficients used to analyze and compare:

- Demographic data
- Perioperative outcomes
- Quality of life surveys

Results

Demographics:
Total patients = 97
Age, years [Mean ± SD] = 61 ± 14
BMI [Mean ± SD] = 27.49± 4.0
46.4% Female, 53.6% Male

Intervention type:
Toupet = 66 (68.0%)
Nissen = 12 (12.4%)
MSA = 19 (19.6%)

Symptom resolution at postoperative pH study:
95% used as cutoff for complete resolution of preoperative symptom
Complete symptom resolution = 34 (35.1%)
Incomplete symptom resolution = 63 (64.9%)

Postoperative pH study results:
Negative = 76 (80%)
Borderline = 10 (10.5%)
Positive = 9 (9.5%)

Figure 1:
- Having 2 or more days of abnormal %AET was positively associated with undergoing endoscopic dilation
- Having 2 or more days of abnormal %AET was positively associated with hernia recurrence
- Resolution of atypical symptoms was negatively associated with total number of reflux events
- Resolution of dysphagia, regurgitation, or globus was strongly negatively associated with days of abnormal DeMeester score and %AET
- Resolution of all symptoms negatively associated with total DeMeester score and days of abnormal %AET
- RSI score strongly positively associated with total DeMeester score and %AET

Figure 2:
- Complete symptom resolution was not significantly associated with overall pH study results
- Atypical symptom resolution was not significantly associated with overall pH study results
- Resolution of any single symptom was not significantly associated with overall pH study results
- RSI score $\leq$ 13 was not significantly associated with overall pH study results

Figure 3:
- GERD-HRQL score of $\leq$ 10 was associated with negative or borderline pH study results 97.2% of the time (p= 0.007)

Figure 1. Spearman correlation coefficients between pH study metrics and outcomes

		Total Number of Refluxes	Total Long Refluxes (> 5 min)	Longest Acid Reflux (min)	Total Acid Exposure Time (min)	% Acid Exposure Time	DeMeester Score Total	Days of Abnormal %AET	2+ Days of Abnormal %AET	Days of Abnormal DeMeester Score	2+ Days of Abnormal DeMeester Score
Symptom Resolution	Postop Dilation	0.15	0.05	0.01	0.11	0.11	0.09	0.18	0.21	0.16	0.22
		0.1922	0.6278	0.9561	0.3303	0.3037	0.4472	0.0796	**0.0396**	0.1240	**0.0343**
	Recurrence	0.07	-0.05	-0.08	-0.02	-0.02	-0.02	0.17	0.29	0.14	0.18
		0.5482	0.6811	0.4921	0.8256	0.8349	0.8352	0.0941	**0.0043**	0.1719	0.0887
	Atypical Symptom Resolution	-0.26	-0.21	-0.16	-0.20	-0.21	-0.20	-0.10	-0.13	-0.08	-0.14
		0.0477	0.1199	0.2295	0.1249	0.1224	0.1418	0.4293	0.2919	0.5031	0.2617
	Dysphagia	**-0.56**	**-0.55**	**-0.50**	**-0.56**	**-0.56**	**-0.52**	**-0.54**	-0.27	**-0.51**	**-0.47**
		0.0044	**0.0054**	**0.0118**	**0.0049**	**0.0044**	**0.0087**	**0.0036**	0.1712	**0.0064**	**0.0123**
	Regurgitation	-0.22	-0.21	-0.20	-0.17	-0.18	-0.15	**-0.55**	-0.28	**-0.49**	**-0.46**
		0.1493	0.1753	0.2158	0.2801	0.2410	0.3251	**<.0001**	**0.0399**	**0.0002**	**0.0004**
	Globus Sensation	**-0.28**	**-0.54**	**-0.67**	**-0.49**	**-0.51**	**-0.57**	**-0.50**	-0.33	**-0.50**	**-0.41**
		0.3212	**0.0384**	**0.0093**	0.0632	0.0501	**0.0256**	**0.0492**	0.2103	**0.0491**	0.1140
	All Symptoms	-0.37	**-0.42**	-0.39	-0.36	-0.38	-0.38	-0.33	-0.06	-0.24	-0.21
		0.0010	**0.0001**	**0.0006**	**0.0012**	**0.0006**	**0.0006**	**0.0014**	0.5483	**0.0226**	**0.0421**
Quality of Life (≥ 1 Year)	RSI	0.30	**0.44**	0.38	**0.41**	**0.42**	**0.41**	0.17	0.11	0.07	0.05
		0.0641	**0.0061**	**0.0262**	**0.0105**	**0.0084**	**0.0101**	0.2863	0.4952	0.6704	0.7582

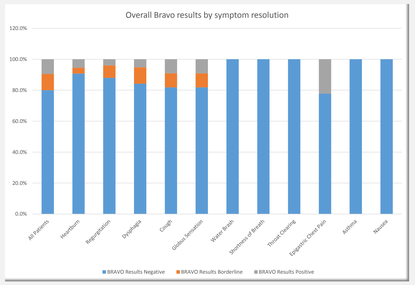


Figure 2

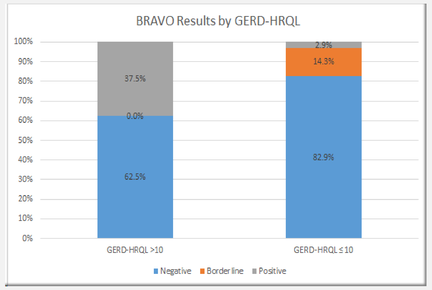


Figure 3

Conclusion

- **Multiple clinical outcomes are significantly associated with pH study metrics**
- **A GERD-HRQL score of $\leq$ 10 is associated with overall negative or borderline pH study results 97.2% of the time**
- **In the appropriate clinical context, these patients may be excluded from postoperative pH testing**

Acknowledgments

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