PROLONGED BRAVO™ WIRELESS PH MONITORING PREDICTS PATIENT OUTCOMES AFTER ANTI-REFLUX OPERATIONS

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Background

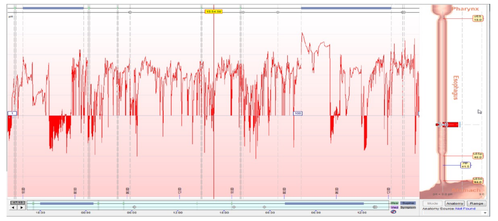
- The Bravo™ catheter-free wireless pH monitoring system with measurement up to 96 hours has been shown to be an effective and sensitive modality to accurately diagnose gastroesophageal reflux disease (GERD).
- **Aim -** Identify association between Bravo parameters and patient clinical and quality of life (QOL) outcomes after anti-reflux operations.

Methods

- Retrospective review of a prospectively maintained gastroesophageal (GE) quality database.
- All patients with preoperative Bravo pH testing data who underwent anti-reflux operations were included.
- Clinical and QOL outcomes collected up to five years postoperatively
  - Reflux Severity Index (RSI)
  - Gastroesophageal Reflux Disease-Health Related Quality of Life (GERD-HRQL)
  - Dysphagia Scores
  - Patient satisfaction
- In case of Bravo capsule migration, pH data collected after the migration were excluded from analysis.
- Partial Spearman correlation coefficients (r) and multivariable logistic regression analysis were used compare Bravo parameters and patient outcomes while controlling for surgery type, complications and dysmotility.

Results





Bravo™ Reflux Testing System

Demographics and characteristics (N=72)

Total Patients [N]	72
Male Sex [N (%)]	25 (34.7)
Age [Mean ± SD]	57 ± 15
BMI [Mean ± SD]	29.1 ± 4.7
Current/Former Smoker [N (%)]	24 (33.3)
Preop Symptoms [N (%)]	
Belching	3 (4.2)
Reflux	63 (87.5)
Heartburn	50 (69.4)
Regurgitation	50 (69.4)
Dysphagia	24 (33.3)
Cough	31 (43.1)
Laryngitis	14 (19.4)
Chest Pain	21 (29.2)
Preop PPI Use [N (%)]	62 (86.1)
Barrett's Esophagus [N (%)]	3 (4.2)
Dysmotility [N (%)]	16 (22.2)
Redo surgery [N (%)]	5 (6.9)
Hiatal Hernia [N (%)]	43 (59.7)
PEH [N (%)]	5 (6.9)
Surgery Type [N (%)]	
Magnetic sphincter augmentation	10 (13.9)
Anti-reflux mucosectomy	17 (23.6)
Toupet fundoplication	21 (29.2)
Nissen fundoplication	24 (33.3)
OR Time, minutes [Mean ± SD]	82 ± 39
Length of Stay, days [Median (IQR)]	1 (0-1)

BRAVO Results [Mean ± SD]	
Capsule Migration [N (%)]	10 (13.9)
Duration (hours)	83 ± 22
DeMeester Score	
Day 1	35.7 ± 24.6
% Abnormal [N (%)]	57 (79.2)
Day 2	27.8 ± 17.8
% Abnormal [N (%)]	40 (80.0)
Day3	31.5 ± 22.8
% Abnormal [N (%)]	40 (80.0)
Day 4	22.3 ± 14.5
% Abnormal [N (%)]	33 (66.0)
Number of Abnormal Days [N (%)]	
1	5 (10)
2	9 (18)
3	14 (28)
4	22 (44)
Total Score	32.3 ± 14.0
Worst Day Score	48.7 ± 23.8
Number of Reflux Episodes (pH<4)	148 ± 74
Longest Reflux Episode (minutes)	42.3 ± 31.7
% Time pH<4	9.5 ± 5.4
Symptom Association Probability (SAP)	
Heartburn	83 ± 32
Regurgitation	81 ± 34
Chest Pain	73 ± 36
Cough	53 ± 51
Symptom Index (SI)	
Heartburn	46 ± 28
Regurgitation	43 ± 33
Chest Pain	38 ± 27
Cough	50 ± 0

Results

- Higher **DeMeester scores** on day 2 was associated with higher GERD-HRQL scores (more reflux) at 6 months postoperatively (r=0.66, p=0.027).
- Greater **number of abnormal days** was associated with higher GERD-HRQL scores (more reflux) at 6 months postoperatively (r=0.68, p=0.021).
- Higher Symptom Association Index (***SAP***) and Symptom Index (***SI***) for *regurgitation* symptoms were associated with (up to 2 years postop):
  - Lower GERD-HRQL scores (less reflux)
    - (SAP: r=-0.49, p=0.053; SI: r=-0.83, p=0.021)
  - Lower Dysphagia Scores (less dysphagia)
    - (SAP: r=-0.49, p=0.024; SI: r=-0.51, p=0.036)
  - Higher patient satisfaction
    - (SAP: r=0.55, p=0.099; SI: r=0.95, p=0.001)
- **Capsule migration** was predictive of less symptom resolution postoperatively [OR 0.09 (95%CI 0.02-0.50), p=0.006].

Conclusion

- In addition to being a valuable diagnostic tool for GERD, prolonged Bravo wireless pH monitoring for up to 96 hours can help predict patient outcomes after anti-reflux operations.
- This has the potential to help aid surgeons' decision-making process to proceed with appropriate anti-reflux surgery, optimize patient reflux control, and improve quality of life outcomes.

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