
14th ANNUAL
NCSCG
POST-DDW
SYMPOSIUM
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McKinley
Christian Health Care Services
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the Northern California Society for Clinical Gastroenterology
Northern California Society
for Clinical Gastroenterology

The Best of the Best in GI at DDW 2017, Chicago, IL

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COI and Topics To Be Covered

- *Topics Not To Discuss*
  - FMT
  - Hepatology
  - IBD
  - Advanced Endoscopy
  - Colon Cancer Screening
  - Motility Disorders

- *Topics to Highlight*
  - Gastrointestinal Hemorrhage
  - Barrett's Esophagus Screening
  - GERD Therapy

- *COI for Dr. Gerson*
  - Consultant: Capsovision, Inc,
  - Olympus America
  - Consultant:Endogastric Solutions

Weekend Bleeding Outcomes

- International prospective observational study of upper GI haemorrhage:
  does out-of-hours presentation
  affect outcome?

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[3]Singapore General Hospital, Singapore,
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Introduction

- Increased mortality for patients admitted at weekends
  - Not all conditions
  - Not consistent in studies
  - Weeknight effect unclear
- Explanations
  - Reduced senior clinician input/ access to tests
  - Higher co-morbidity, sicker patients
  - Inaccurate coding: retrospective studies

Upper GI bleeding outcomes: a weekend effect?

- Increased mortality, delayed endoscopy & more frequent surgery (USA)

  Shaheen et al, Clin Gastroenterol 2009;3:303-10

- Mortality 13% higher (Wales)

  Button et al, APT 2011;33;64-76

- Increased mortality (Scotland)

  Ahmed et al, W J Gastro 2015;21:10890-97

- Delayed endoscopy, similar mortality (UK)

  Jairath et al, Am J Gastro 2011;106:1621-38

- Aim: Compare patient characteristics, bleeding severity, endoscopic findings & outcomes in patients with upper GI bleeding by time of presentation to hospital

Methods

- Prospective 12 month data: patients with upper GI bleeding admitted to 4 centres
  - Glasgow, Scotland; Truro, England; Odense, Denmark; Singapore
- Upper GI bleeding
  - Haematemesis, Coffee ground vomiting, Melaena
- Presentation time
  - 0900-1700 Monday - Friday: Weekday
  - 1700-0900 Monday - Friday: Weeknight
  - 1700 Friday - 0900 Monday: Weekend

Methods

- Demographics, comorbidities, ASA score, pulse & BP, blood parameters
- 5 endoscopy scores:

  GBS, AIMS65, Adm. & Full Rockall, PNED

- Time to endoscopy, endoscopic findings, endoscopic therapy, surgery/ int. radiology
- Rebleeding rate, 30 day mortality
- Chi-square, Fishers, Kruskal-Wallis, Bonferroni, Logistic regression

Senior speciality input at weekends by site

	24/7 On call emergency endoscopy	Weekend senior GI round	Regular inpatient weekend endoscopy
Singapore	√	X	X
Odense	√	√	X
Glasgow	√	√	X
Truro	√	√	√ (Sunday only)

All sites had 24/7 on-call Surgery & Int Radiol.

Results 1. Characteristics of patients presenting with upper GI bleeding

	Weekdays	Weeknights	Weekends
Number of patients	858	603	642
Age (years, median, [95% CI)	67 [25-91]	63 [25-90]	66 [24-91]
Sex (male%)	501 (58)	350 (58)	401 (62)
Comorbidity n(%)			
- **Ischaemic heart disease**	169 (20)	101 (17)	106 (17)
- **Liver disease**	110 (13)	99 (16)	79 (12)
- **Renal failure**	100 (12)	52 (9)	52 (8)
- **Any malignancy**	112 (13)	78 (13)	68 (11)
- **ASA-score (mean [95% CI)**	2.3 [1-3]	2.3 [1-3]	2.2 [1-3]

Results 2. Severity of upper GI bleeding

	Weekdays	Weeknights	Weekends	Total
Systolic BP (mmHg, med [95% CI)	126 [90-170]	125 [86-165]	125 [88-170]	**126 [88-169]**
Pulse (med [95% CI)	90 [62-126]	91 [64-127]	91 [61-129]	**90 [62-127]**
Haemoglobin (med [95% CI)	**110 [55-161]** *	118 [61-165]	117 [58-164]	**114 [58-162]**
Score (mean, [95% CI)				
- **GBS**	6.7 [0-14]	6.1 [0-14]	6.3 [0-14]	**6.4 [0-14]**
- **AIMS65**	1.0 [0-3]	1.0 [0-3]	1.0 [0-3]	**1.0 [0-3]**
- **Adm. Rockall score**	2.6 [0-5]	2.5 [0-5]	2.5 [0-5]	**2.6 [0-5]**
- **Full Rockall score**	3.8 [1-7]	3.7 [1-6]	3.6 [1-7]	**3.7 [1-7]**

Results 3. Endoscopic findings based on time of presentation

Findings at endoscopy n(%)	**Weekdays**	Weeknights	Weekends	**Total**
- **Normal**	**115 (17) ***	42 (10)	**79 (17)**	**237 (15)**
- **Erosive disease**	199 (30)	141 (34)	135 (29)	**481 (31)**
- **Gastric/duodenal ulcer**	174 (26)	107 (26)	118 (26)	**403 (26)**
- **Variceal bleeding**	45 (6.8)	36 (8.6)	22 (4.8)	**104 (6.7)**
- **Upper GI cancer**	25 (3.8)	10 (2.4)	18 (3.9)	**53 (3.4)**
Not endoscoped	199 (23)	185 (31)	183 (29)	**567 (27)**
Time to endo (hrs; med [95% CI)	20 [3-70]	**13 [3-56]****	17 [3-72]	**17 [3-71]**

*$p<0.01$; **$p<0.005$

Results 4. Outcome of patients based on time of presentation

	Weekdays	Week-nights	Weekends	Total
Treatment				
Number of Transfusions (mean, [95% CI)	1.42 [0-6]	1.26 (0-6]	1.43 [0-6]	**1.37 [0-6]**
Endo. Treatment n(%)	185 (22)	116 (19)	126 (20)	**430 (20)**
Surgery/Int Rad. n(%)	4 (0.5)	6 (1.0)	6 (0.9)	**16 (0.8)**
Outcomes				
Rebleeding n(%)	49 (5.8)	33 (5.7)	43 (6.9)	**126 (6.1)**
30-day mortality n(%)	61 (7.1)	43 (7.1)	48 (7.5)	**153 (7.2)**

Mortality of patients by site based on time of presentation

	Weekdays	Weeknights	Weekends	Total
30-day mortality				
- **Singapore**	11/175 (6.3%)	5/118 (4.2%)	5/139 (3.6%)	**21/432 (4.9%)**
- **Odense**	21/247 (8.5%)	11/125 (8.8%)	13/162 (8.0%)	**45/534 (8.4%)**
- **Glasgow**	15/257 (5.8%)	11/167 (6.6%)	12/171 (7.0%)	**38/595 (6.4%)**
- **Truro**	14/179 (7.8%)	16/192 (8.3%)	18/170 (10.6%)	**48/541 (8.9%)**
Total	61/858 (7.1%)	43/602 (7.1%)	48/602 (7.5%)	**152/2102 (7.2%)**

85% power to identify a 3% difference in mortality

Conclusions

- Patients with UGIB presenting during these three time periods have similar age, comorbidities & bleeding severity
- Patients presenting on weeknights had shortest wait for endoscopy
- In these large units, patients presenting with UGIB on weekdays, weeknights & weekends had similar 30-day mortality & rebleeding rates

Prospective RCT of Prophylactic Hemoclipping Post-Polypectomy for Large Colonic Polyps

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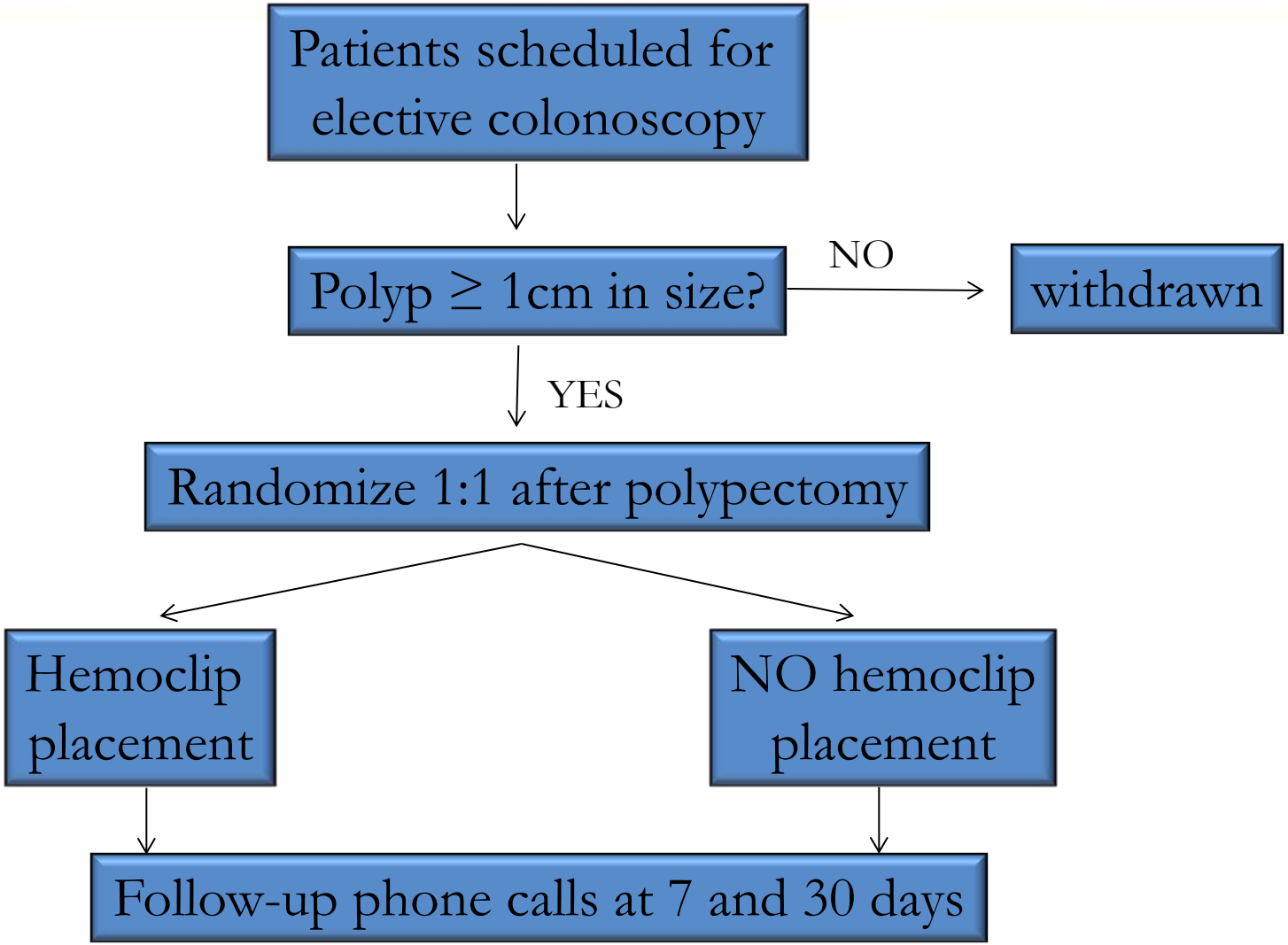
- Aim 1:
  - To determine whether the prophylactic placement of hemoclips at the polypectomy site after the removal of large polyps (≥1cm in size) will reduce the rate of clinically important delayed post-polypectomy bleeding.
- Hypothesis
  - The prophylactic placement of hemoclips does not decrease the risk of bleeding
- Aim 2:
  - To determine if there are subgroups (anticoagulant use, polyp characteristics) that may benefit from hemoclipping

Study Design: Prospective Randomized Equivalence Study



Primary End-Point

- clinically important delayed bleeding within 30 days of polypectomy
  - rectal bleeding occurring between completion of the colonoscopy and 30 days of polypectomy and results in ≥1 of the following:
    - blood transfusion
    - hemodynamic instability
    - fall in hemoglobin by at least 2 grams per deciliter from previous baseline
- 1784 patients randomized (polyps ≥ 1cm)
- Interim analysis: 600 randomized

Interim Analysis

- Patients enrolled: 5648
- Patients randomized: 632 (11% of enrolled)
  - 20 still in 30 day follow-up window
  - 2 lost to follow-up
- 610 completed, 19 important delayed bleeds (3%)
- At 30 days, no significant difference between groups for PPB - 9 of 308 (2.9%) patients undergoing clipping versus 10 or 302 not undergoing clipping (3%) p=0.82

Demographic and Clinical Features

	Hemoclip (n=308)	No hemoclip (n=302)	p value
Age $\bar{X}$(SD)	64.6 (7.7)	64.7 (8.2)	.45
Body Mass Index	31.1 (6.5)	31.4 (13.8)	.27
Male sex (% of total)	299 (97.1%)	292 (96.7%)	.82
Comorbid Diseases			
Coronary artery disease	45 (14.6%)	65 (21.5%)	.03
Congestive heart failure	41 (13.3%)	39 (12.9%)	.91
Hypertension	228 (74%)	211 (69.9%)	.25
Diabetes mellitus	113 (36.7%)	111 (36.8%)	1.0
Peripheral vascular disease	13 (4.9%)	21 (7.0%)	.28
Cerebrovascular accident / Transient ischemic attack	23 (7.5%)	29 (9.6%)	.35
Lung disease	54 (17.5%)	64 (21.2%)	.26
Renal disease	24 (7.8%)	24 (7.9%)	1.0
Family history of colon cancer	36 (11.7%)	51 (16.9%)	.08

Similar Use of Antiplatelet and Antithrombotic Medications

	Hemoclip (n=308)	No hemoclip (n=302)	p value
Aspirin	144 (46.8%)	161 (53.3%)	.12
NSAIDs	49 (15.9%)	46 (15.2%)	.82
Thienopyridine (e.g. clopidogrel)	19 (6.2%)	17 (5.6%)	.86
Warfarin or Direct-acting oral anticoagulant (e.g. dabigatran)	33 (10.7%)	32 (10.6%)	1.0
Heparin	10 (3.2%)	12 (4.0%)	.67

Polyp Morphology and Removal Technique

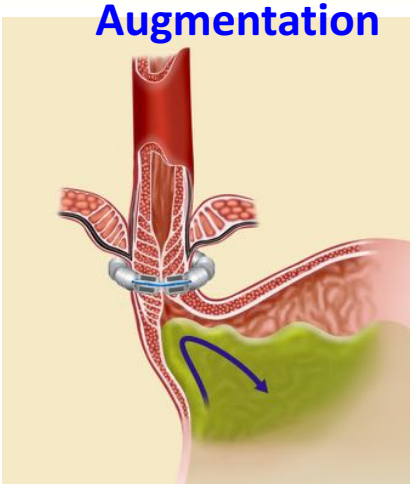
	Hemoclip (n=308)	No hemoclip (n=302)	*p* value
Polyp Morphology			
Sessile	296/412 (72%)	297/413 (72%)	
Pedunculated	116/412 (28%)	116/413 (28%)	.98
Removal Technique			
Hot snare	381/392 (97%)	389/400 (97%)	
Cold snare	8/392 (2%)	4/392 (1%)	
Cold forceps	3/392 (0.8%)	7/392 (1.8%)	.23

GERD: Endoscopic or Surgical Options

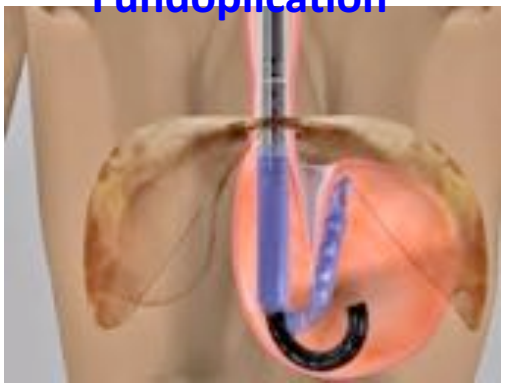
Nissen Fundoplication

Gastric Bypass

Magnetic Sphincter Augmentation



Transoral Incisionless Fundoplication



Radiofrequency

Endoscopic Stapling

Magnetic Antireflux Device

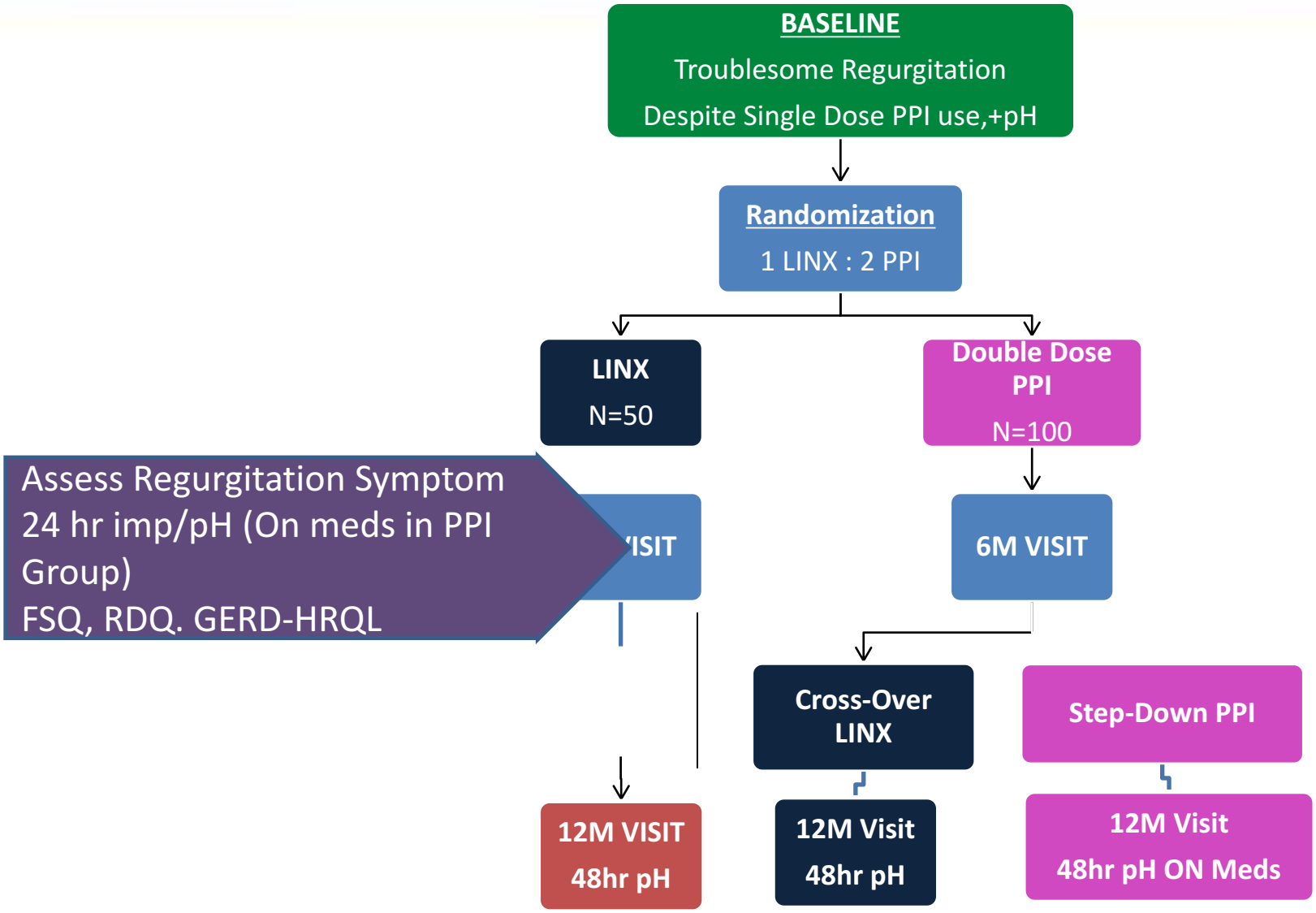
- FDA approved 2012
- Expands to more than twice diameter to allow food to pass
- Augments resting LESP and prevents inappropriate relaxations
- Emesis can occur

Study Design

- Prospective, Multicenter Study (22 sites).
- Patients with moderate to severe regurgitation despite once-daily PPI therapy and having abnormal pH test off acid-suppressive medication.

- Primary Endpoint: % of patients reporting elimination of moderate or severe regurgitation at 6 months (FSQ measure).
- Additional Outcomes: Impedance/pH; GERD-HRQL and RDQ; Side Effects; Safety.

Study Design Summary

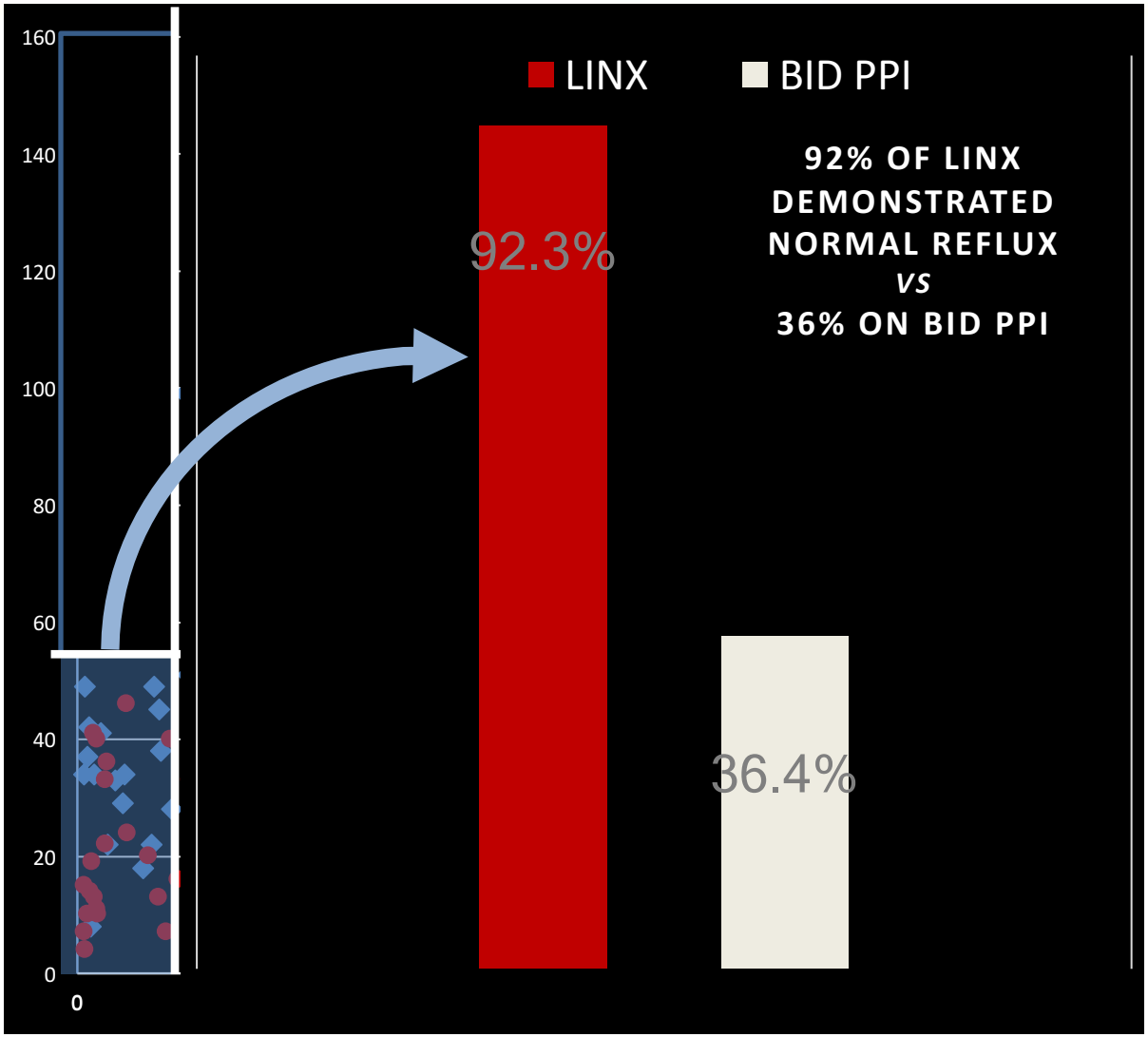


Baseline Demographics of these 80 patients

Parameter*	LINX N=50	Double Dose PPI N=100	P-value
Total % Time pH <4	12.9	11.1	.216
DeMeester Score	40.7	38.2	.529
GERD-HRQL Score On qd PPI	23.5	25.1	.342
GERD-HRQL Off PPI	31.6	30.3	.392
RDQ Score – Regurgitation^	4.2	4.4	.366
RDQ Score – Heartburn^	3.4	3.6	.484

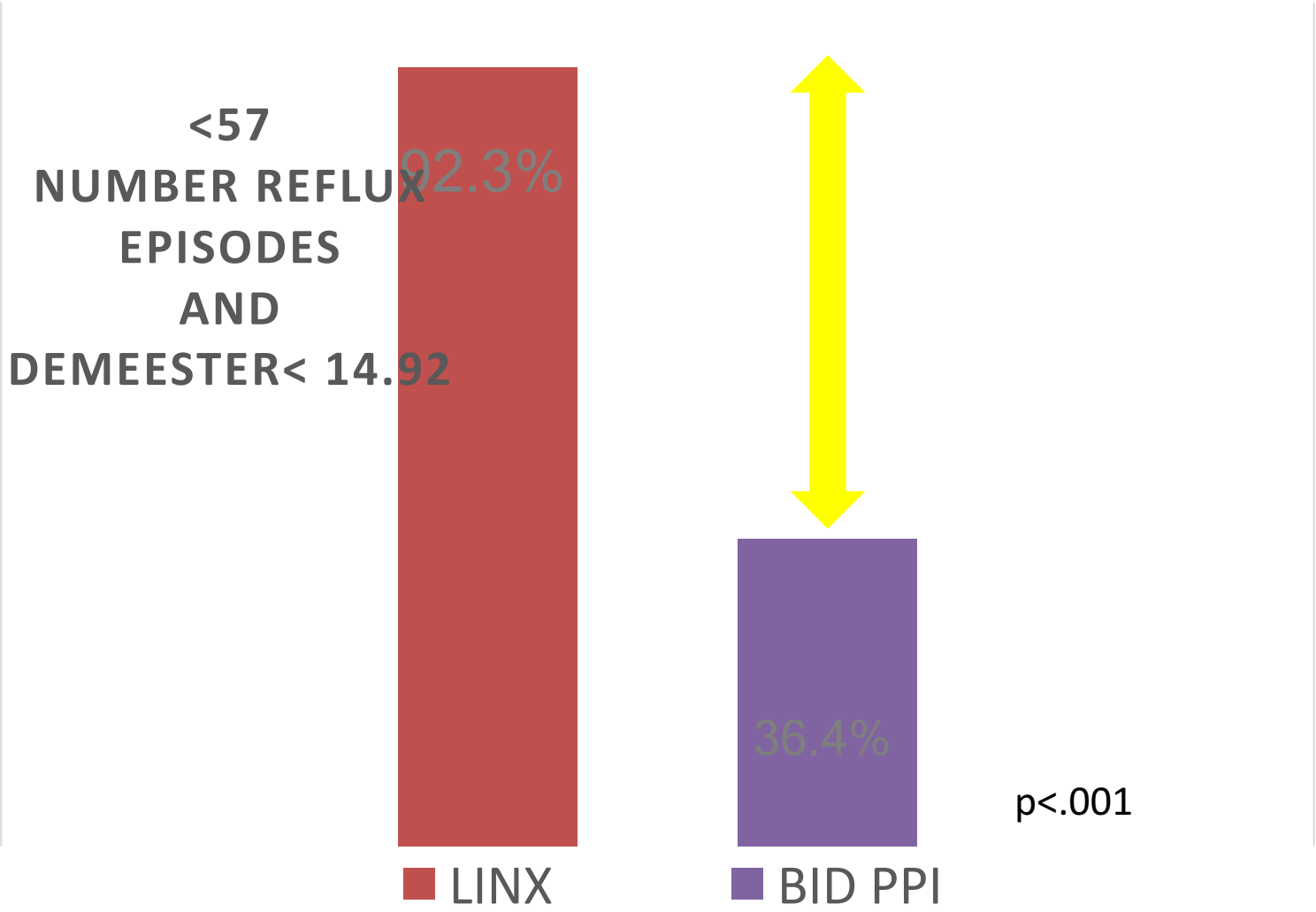
*Reported as mean ^ Completed On PPI

Reflux Episodes and DeMeester at 6 months (Imp/pH)



PATIENTS WITH <57 REFLUX EPISODES AND DEMEEST ER

Percent Patients with Normal Reflux at 6 months



Double Balloon Enteroscopy

Yield of Repeat DBE, Mayo Clinic

1920 BAE Procedures
n=1,383

Excluded
Only 1 BAE per patient performed
n=1,014

> 1 BAE
n=369

Excluded
> 1 BAE
for other indications
n=194

Included in Analysis
> 1 BAE for small bowel bleeding
n=175

Balloon Assisted Enteroscopy and Small Bowel Bleeding

- Rebleeding rate after BAE therapy: 40%-46%
- Rebleeding rate after negative BAE: 38%
- Optimal management strategy for rebleeding after BAE is not well delineated

May, A., et al. Endoscopy, 2011
Samaha, E., et al. Am J Gastroenterol, 2012
Gerson, L.B., et al., Clin Gastroenterol Hepatol. 2009
Shinozaki, S., et al. Dig Dis Sci, 2015

Baseline Characteristics at Initial BAE

Characteristic	Value
Age, years	64.1 ± 16.3
Male	97 (55%)
Clinical Presentation	
Melena	71 (40%)
Hematochezia	17 (10%)
Occult	87 (50%)
Medical Comorbidities*	
Cardiac	57 (33%)
CKD	36 (21%)
Liver cirrhosis	10 (6%)
COPD	24 (14%)
Medications *	
ASA	63 (36%)
NSAID	9 (5%)
Warfarin	33 (19%)
Clopidogrel	14 (8%)

CKD: chronic kidney disease, COPD: chronic obstructive pulmonary disease; ASA: aspirin; NSAID: non-steroidal anti-inflammatory drugs. *

Initial Small Bowel Imaging Findings

Characteristic	Value
Capsule Endoscopy, n (%)	134 (76%)
Active bleeding	43 (32%)
Angioectasia	32 (24%)
Ulcer	13 (10%)
Mass	4 (3%)
Negative	42 (31%)
CTE, n (%)	72 (30%)
Angioectasia	22 (31%)
Active bleeding	3 (4%)
Inflammation	5 (7%)
Mass	3 (4%)
Negative	39 (54%)

CTE: computed tomography enterography

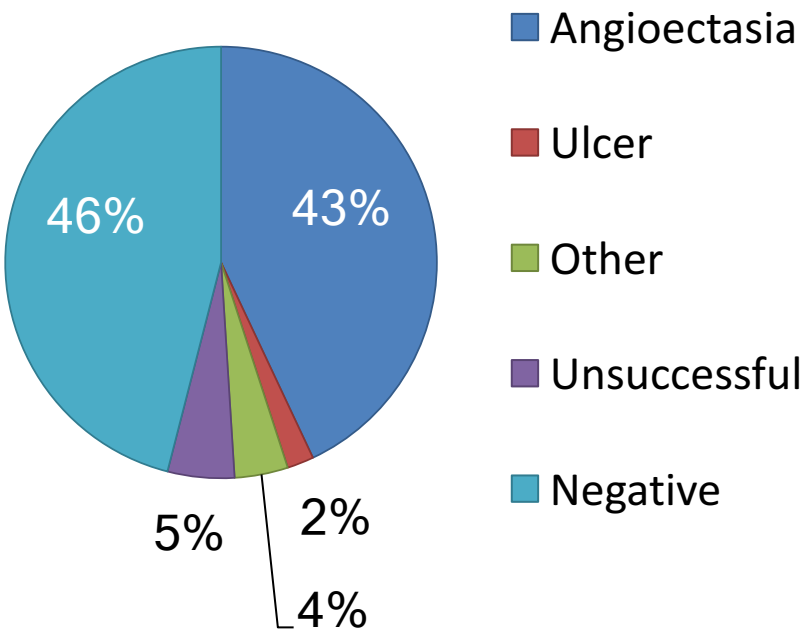
Repeat BAE Details

Procedure Details	BAE (n=175)
Route of BAE, n (%)	
Antegrade	81 (46%)
Retrograde	94 (54%)
Same Route as Initial BAE	62 (35%)
Type of BAE, n (%)	
Double Balloon	167 (95%)
Single Balloon	8 (5%)

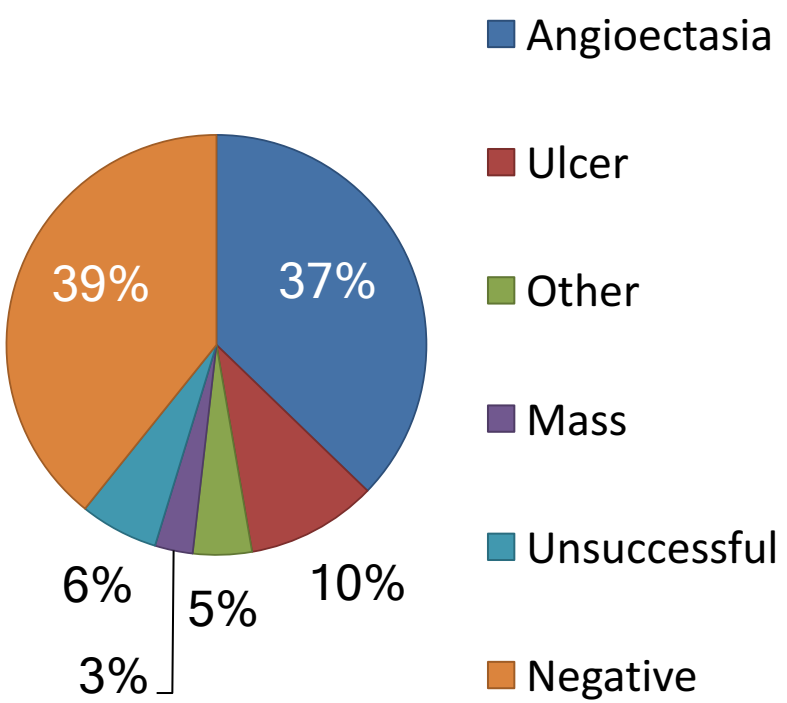
BAE: balloon assisted enteroscopy

Diagnostic Yield of Initial and Repeat BAE

Initial BAE: 49%

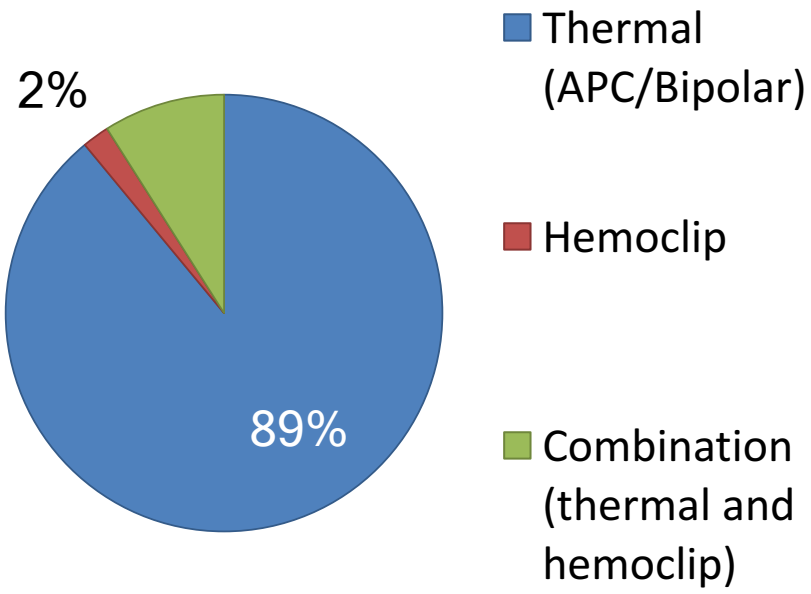


Repeat BAE: 55%

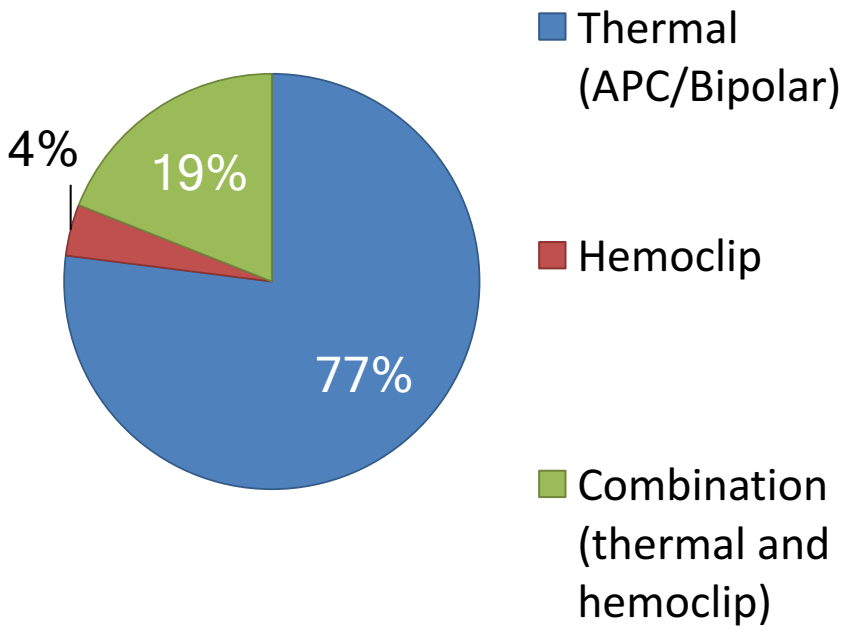


Therapeutic Yield of Initial and Repeat BAE

Initial BAE: 46%



Repeat BAE: 42%



Predictors of Positive Repeat BAE

Characteristic	Positive (n=73)	Negative (n=102)	P
Age, years	68.6 ± 13.9	60.9 ± 17.1	0.001
Male	41 (56%)	56 (55%)	0.87
Clinical Presentation			0.27
Melena	32 (44%)	40 (39%)	
Hematochezia	4 (5%)	13 (13%)	
Occult	37 (51%)	49 (48%)	

Predictors of Positive Repeat BAE

Characteristic	Positive (n=73)	Negative (n=102)	Odds Ratio (95% CI)	P
Medical Comorbidities				
Cardiac	32 (44%)	25 (25%)	2.4 (1.3-4.6)	0.007
CKD	21 (29%)	15 (15%)	2.3 (1.1-4.9)	0.02
Cirrhosis	5 (7%)	5 (5%)	1.4 (0.4-5.1)	0.58
COPD	16 (22%)	8 (8%)	3.3 (1.3-8.1)	0.009
Medications				
ASA	32 (44%)	31 (30%)	1.8 (0.9-3.3)	0.07
NSAID	4 (6%)	5 (5%)	1.1 (0.3-4.3)	0.86
Warfarin	13 (18%)	20 (20%)	0.9 (0.4-1.9)	0.76
Clopidogrel	9 (12%)	5 (5%)	2.7 (0.9-8.5)	0.07

CKD: chronic kidney disease, COPD: chronic obstructive pulmonary disease; ASA: aspirin; NSAID: non-steroidal anti-inflammatory drugs

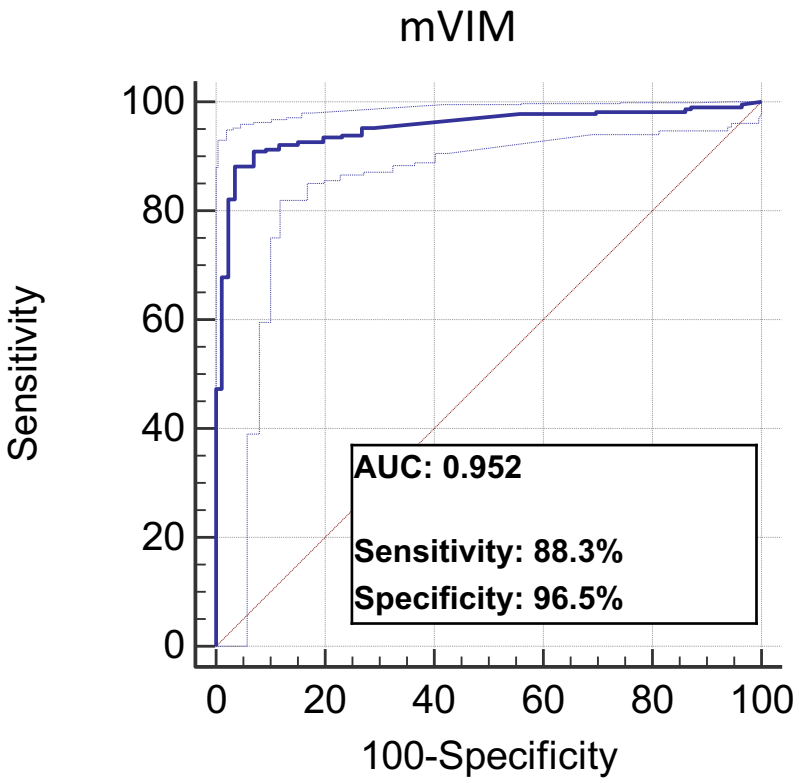
Predictors of Positive Repeat BAE

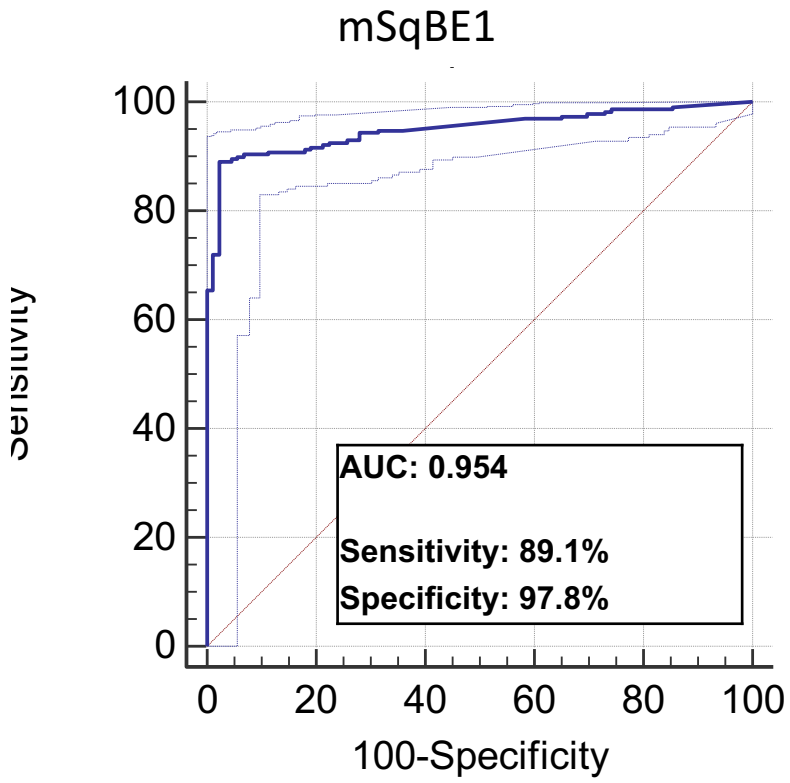
Characteristic	Positive (n=73)	Negative (n=102)	Odds Ratio (95% CI)	P
Initial BAE Details				
SBE	4 (5%)	9 (9%)	0.6 (0.2-2.0)	0.40
Antegrade	55 (75%)	81 (79%)	0.8 (0.4-1.6)	0.52
Therapy Performed	47 (64%)	34 (33%)	3.6 (1.9-6.8)	<0.001
Repeat BAE Details				
Inpatient	24 (33%)	30 (30%)	1.2 (0.6-2.2)	0.62
DBE	71 (97%)	96 (94%)	0.5 (0.1-2.3)	0.33
Antegrade	46 (63%)	35 (34%)	3.3 (1.7-6.1)	<0.001
Same route as initial BAE	36 (49%)	26 (26%)	2.8 (1.5-5.4)	0.001

BE Screening Update

Test Set - Methylated DNA Screening Biomarkers

(VIM) and SqBE1 in a set of endoscopic esophageal brushings from 230 cases of BE/EAC and 91 controls

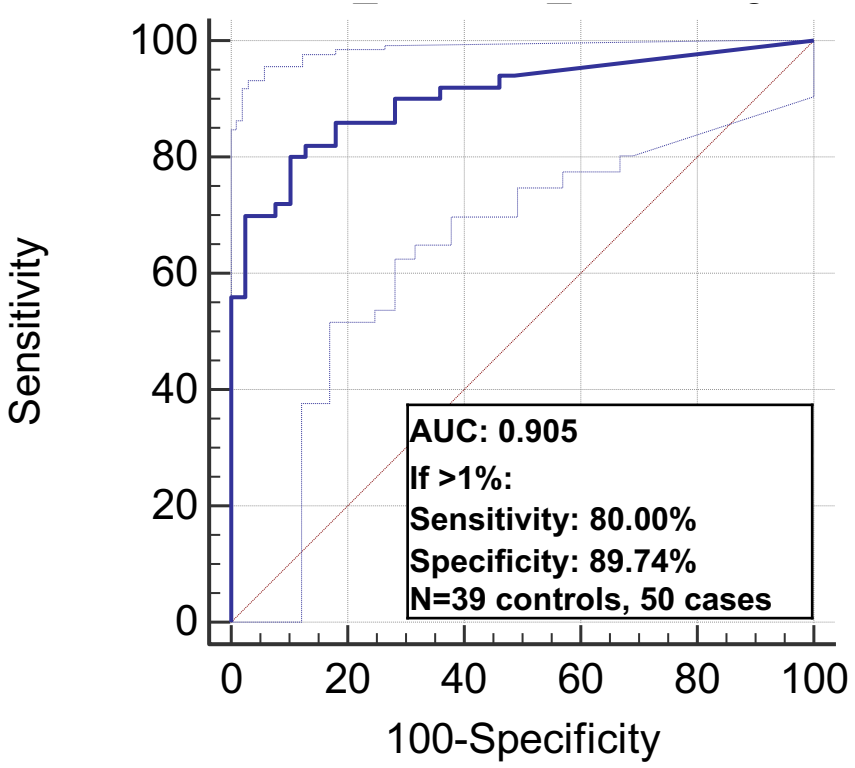




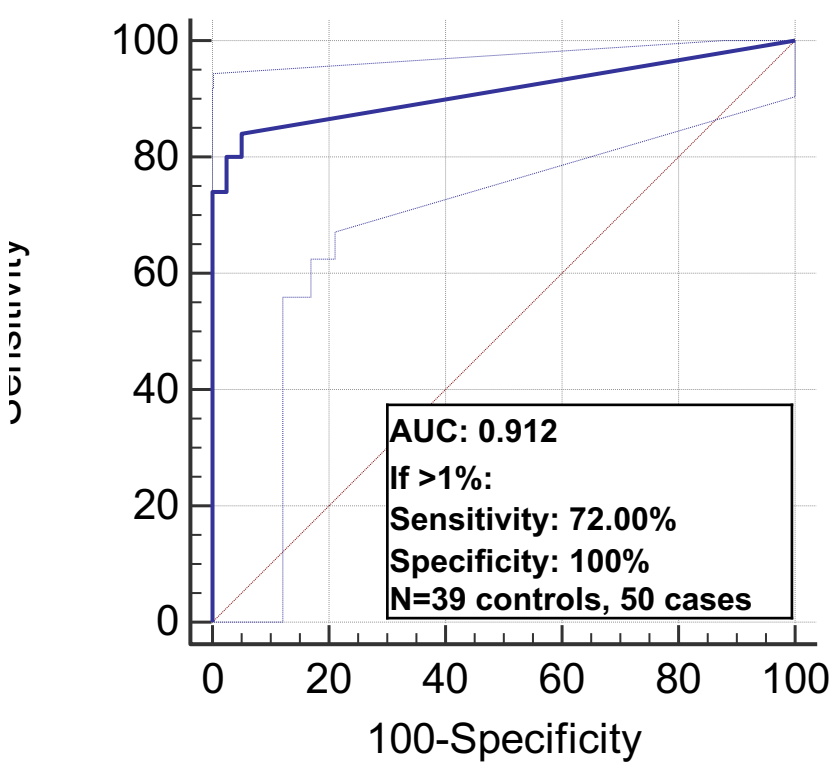
Novel JASSS (Joe/Amitabh/Sandy Swallowable Sampling Balloon) Device

Non-endoscopic Sampling Performs As Well As Endoscopic Brushings

VIM



SqBE1



Non-endoscopic Sampling: mVIM + mSqBE1 Performance in 89 Subjects

	Sample #	*mVIM (Positive if >1.0%)*	*mSqBE1 (Positive if >1.0%)*	*Either mVIM Or mSqBE1 Positive*
Specificity on Controls	**39**	**90%**	**100%**	**90%**
Sensitivity: Non-Dysplastic BE (>1cm)	**32**	**84%**	**72%**	**91%**
Sensitivity: All BE (Non-Dysplastic + Dysplastic)	**42**	**79%**	**71%**	**88%**
Sensitivity: Cancers (EAC/JCA)	**8**	**88%**	**75%**	**88%**

Take Home Messages

- Patients preseing with UGIB have similar outcomes if EGD occurs at night, weekday or weekends.
- Prophylactic post-polypectomy clipping is likely not worth the cost
- LINX procedure is effective for pH and symptom control with non-controlled data out to 5 years
- Consider repeat deep enteroscopy for patients at high risk of rebleeding
- You may be screening for BE in the future with sponges, brushes and swallowable balloons

Thank You for Your Attention