NASPGHAN Annual Meeting & Postgraduate Course 2014

Advanced Endoscopy in Pediatric Populations

Field. F. Willingham, MD, MPH
Director of Endoscopy
Assistant Professor of Medicine

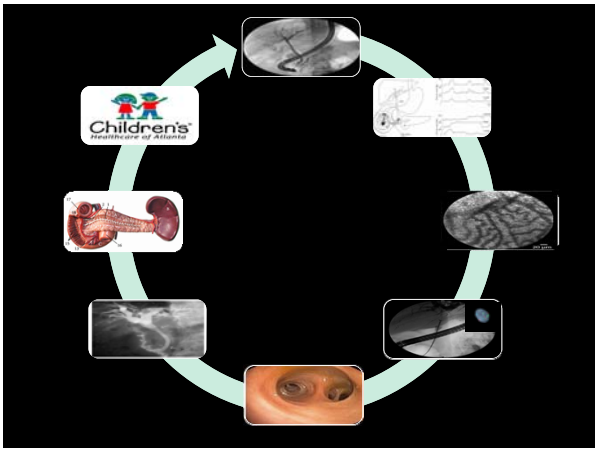
October 25, 2014

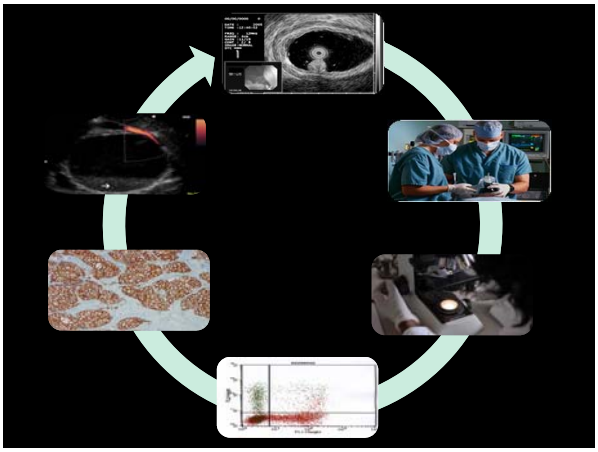
EMORY UNIVERSITY SCHOOL OF MEDICINE
Interventional Endoscopy

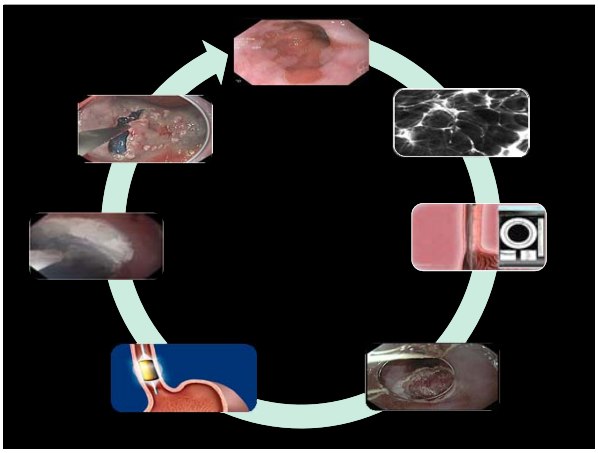
EMORY HEALTHCARE

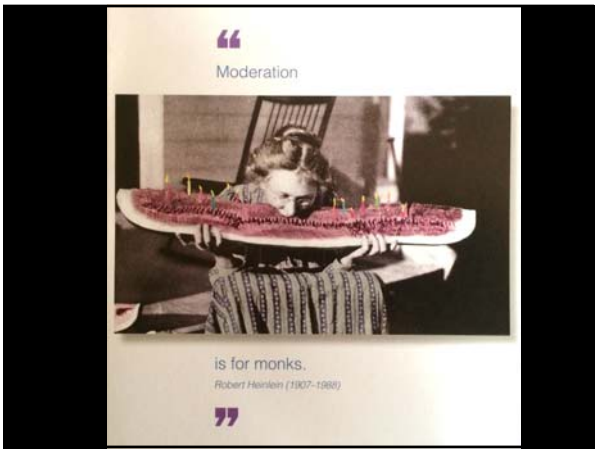
Objectives

- Recall the indications for advanced endoscopic procedures in Pediatric populations.
- Understand the applications and limitations of advanced endoscopic treatments applied to pediatric disease states.
- Understand the role, the outcomes, and the complications associated with the use of ERCP for pediatric presentations.
- Recall the new advances in the management of Barrett's esophagus.
- Understand the novel therapies for achalasia.









GERD SYMPTOMS IN CHILDREN

- Heartburn & regurgitation
- Apnea and/or bradycardia
- Poor appetite / weight loss / failure to thrive
- Wheezing, stridor
- Abdominal pain / chest pain
- Sore throat, hoarseness and/or laryngitis
- Water brash, cough, asthma, pneumonia

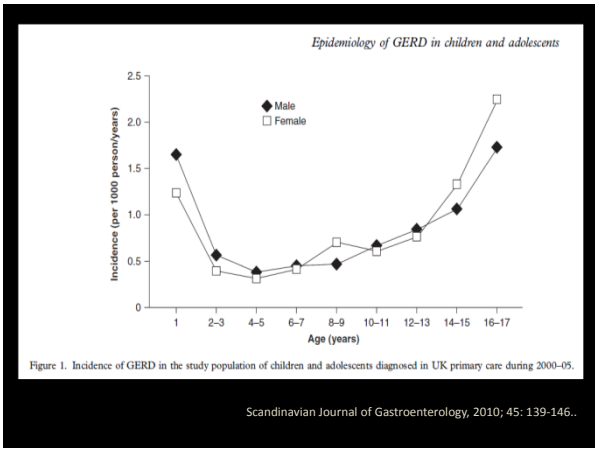


Figure 1. Incidence of GERD in the study population of children and adolescents diagnosed in UK primary care during 2000–05.

Scandinavian Journal of Gastroenterology, 2010; 45: 139-146..

Neurologic impairment
- Esophageal dysmotility, poor esophageal clearance
- LES dysfunction
- Hiatal hernia
- Kyphoscoliosis
- Muscle spasticity
- Seizures
- Recumbency
- Decreased/absent verbal/motor responses to pain or chronic symptoms

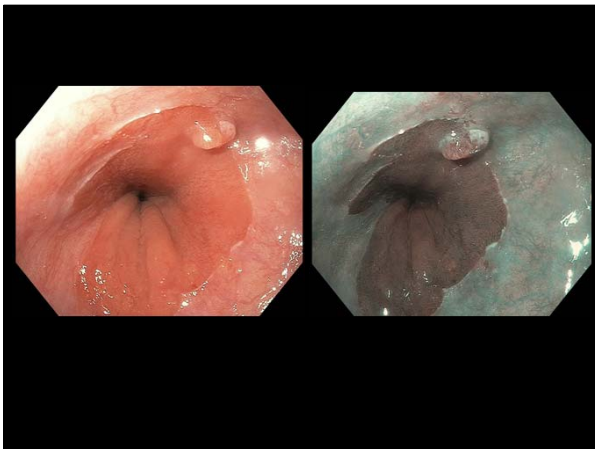
Chronic lung disease
- Chronic cough
- Decreased intrathoracic pressure
- Raised intra-abdominal pressure
- LES dysfunction
- Hiatal hernia
- Prone, head-down position for chest PT
- Decreased reporting of chronic symptoms (often regarded as "part of cystic fibrosis")

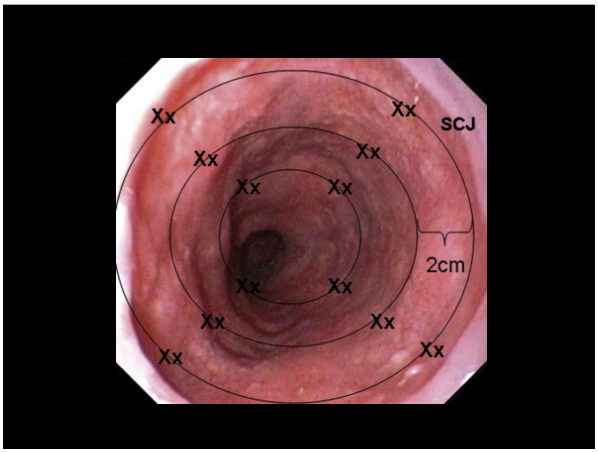
Repaired esophageal atresia
- Dysmotility, poor esophageal clearance
- Hiatal hernia

Chemotherapy for malignancies
- Chemotherapy-induced severe mucositis of esophagus
- Chronic/recurrent emesis

Hiatal hernia

Co-Morbidities in Childhood Barrett's Esophagus
Journal of Pediatric Gastroenterology and Nutrition. 25(3):255-260, September 1997.





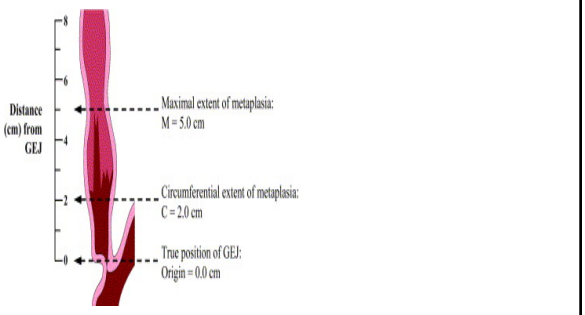
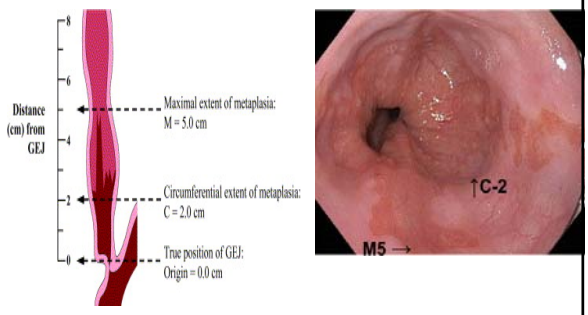


Figure 3 Diagrammatic representation of endoscopic Barrett's esophagus showing an area classified as C2M5 . C : extent of circumferential metaplasia; M : maximal extent of the metaplasia (C plus a distal "tongue" of 3 cm); GEJ : gastroesophageal juncti...

The Development and Validation of an Endoscopic Grading System for Barrett's Esophagus: The Prague C & M Criteria, Gastroenterology, Volume 131, Issue 5, 2006, 1392 – 1399.

http://dx.doi.org/10.1053/j.gastro.2006.08.032



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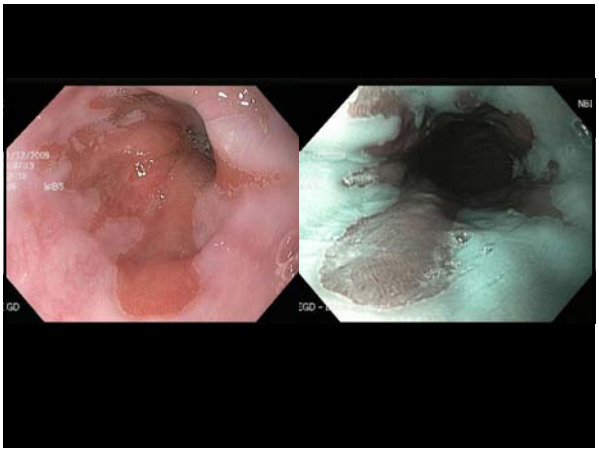
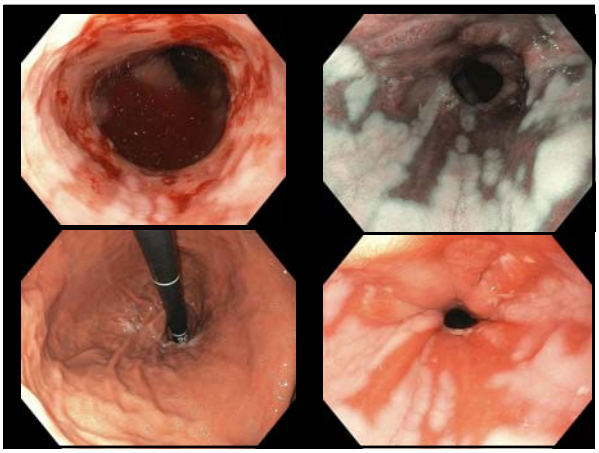


16-year-old female referred with biopsy showing Barrett esophagus.

She has a history of diaphragmatic hernia, repaired in infancy.

Persistent reflux symptoms since birth, mostly controlled on a proton pump inhibitor.

Repair of her hiatal hernia with fundoplication 2010. Subsequently no symptoms on 30mg Prevacid once daily.

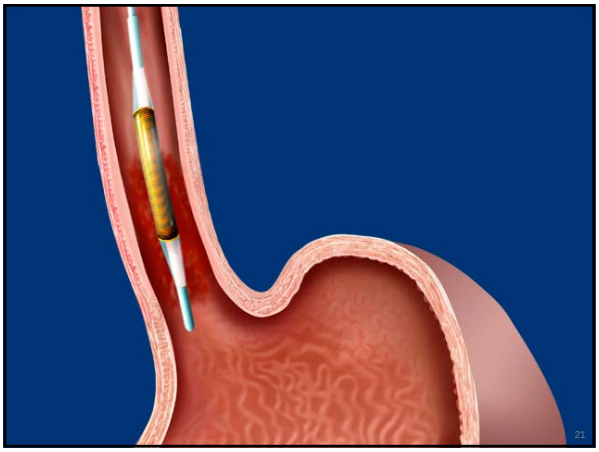


Questions for Patients	Quoted rates
With GERD, what are my chances of having BE?	14%
NDBE, chance of progressing to adenocarcinoma?	0.5% per year
How often to surveil in NDBE?	Q3 years
With HGD, what are my chances of progressing?	36% (6% per year)
Risk of stricture with RFA?	7%
Risk of mortality with esophagectomy?	Up to 10%

Am J Gastroenterol 2012; 107:1655–1661; Am J Gastroenterol 2012;107(4):534-542
Am J Gastroenterol (2000) 95, 1888–1893

Radiofrequency ablation

20



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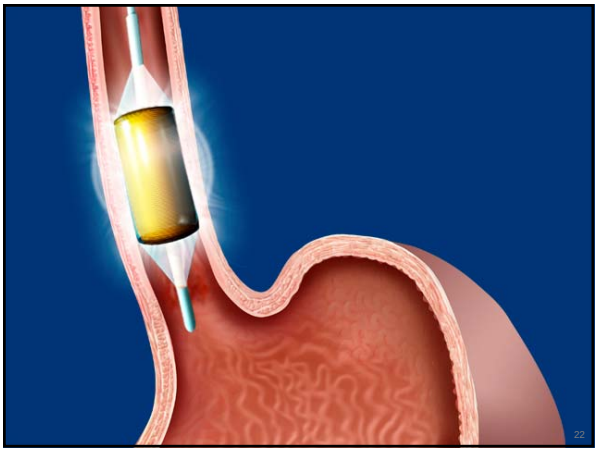

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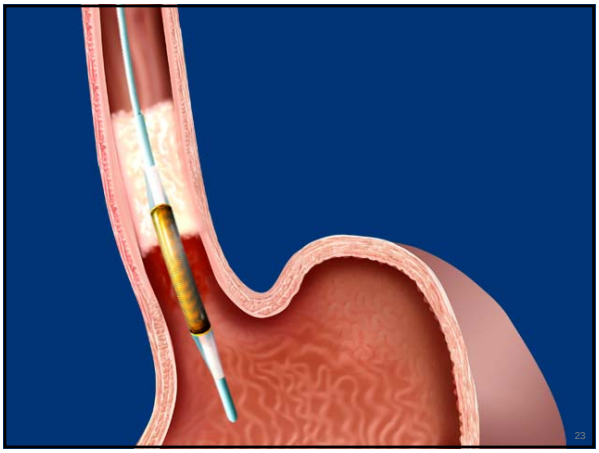

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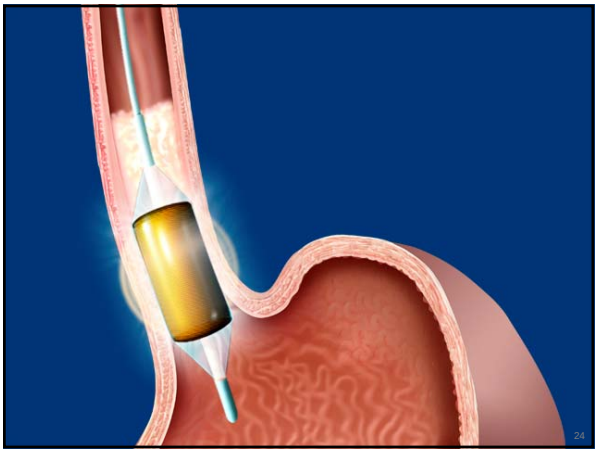

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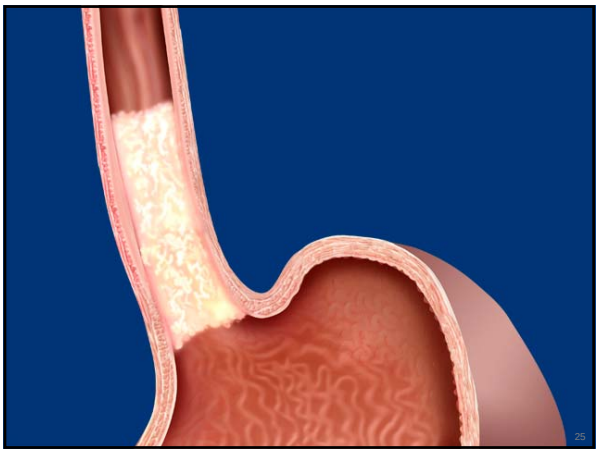
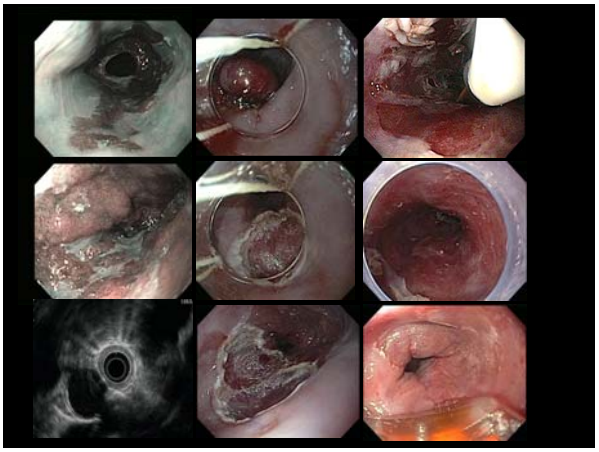
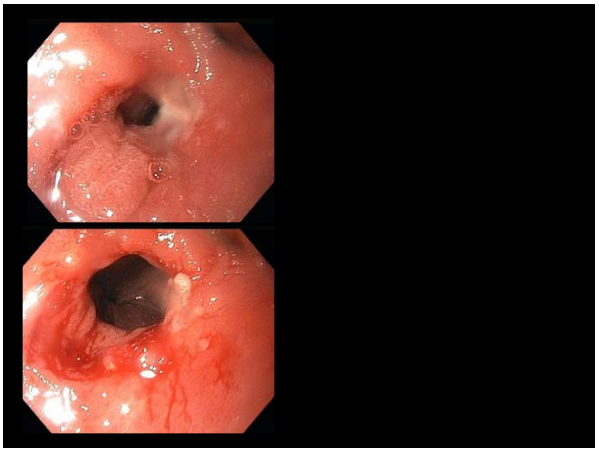
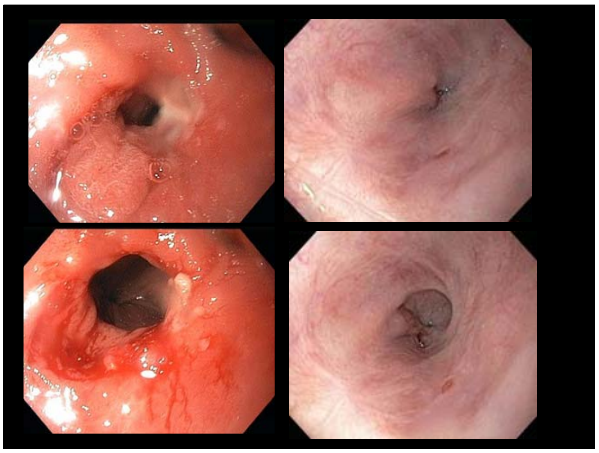


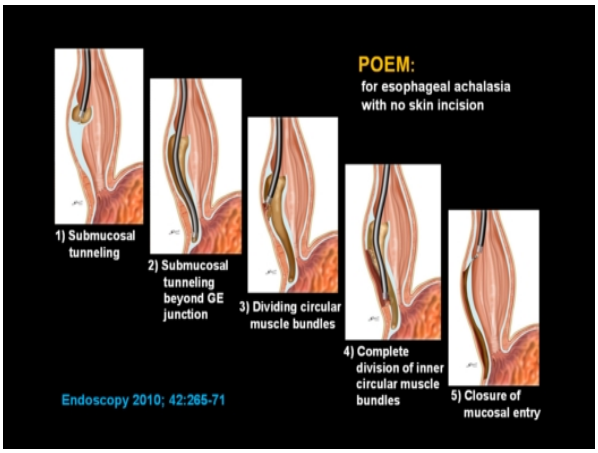


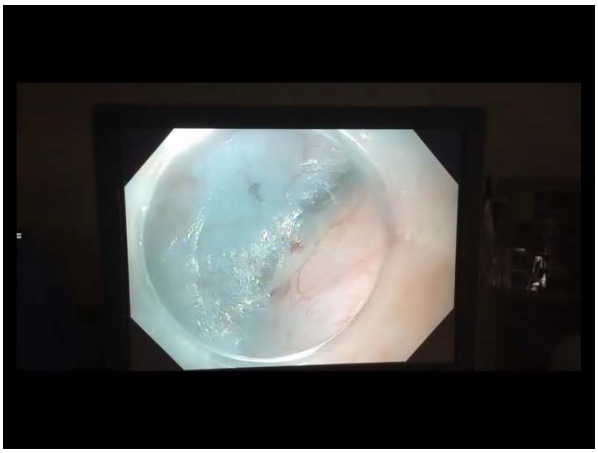




POEM

Per Oral Endoscopic Myotomy





Per-oral endoscopic myotomy white paper summary

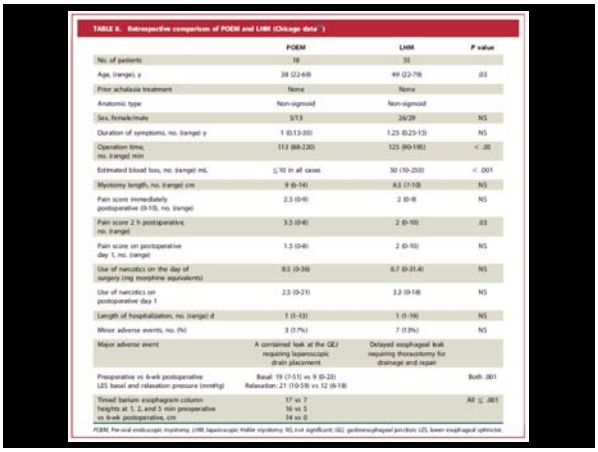
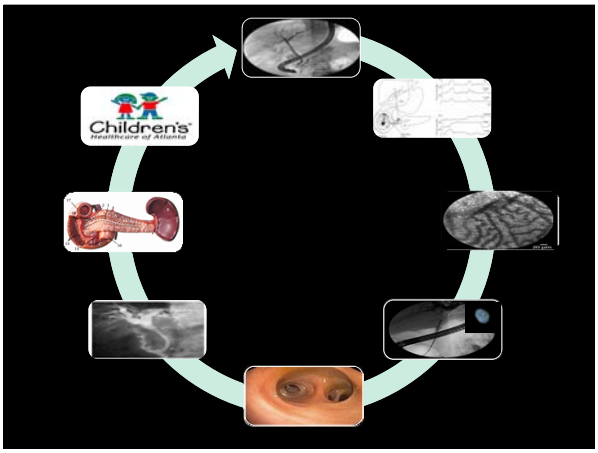


TABLE 8. Retrospective comparison of POEM and LHM (Chicago data[7])

	POEM	LHM	P value
No. of patients	18	35	
Age, (range), y	38 (22-68)	49 (22-79)	.03
Prior achalasia treatment	None	None	
Anatomic type	Non-sigmoid	Non-sigmoid	
Sex, female/male	5/13	26/29	NS
Duration of symptoms, no. (range) y	1 (0.13-30)	1.25 (0.25-15)	NS
Operation time, no. (range) min	113 (88-220)	125 (90-190)	< .05
Estimated blood loss, no. (range) mL	≤10 in all cases	30 (10-250)	< .001
Myotomy length, no. (range) cm	9 (6-14)	8.5 (7-10)	NS
Pain score immediately postoperative (0-10), no. (range)	2.5 (0-9)	2 (0-9	NS
Pain score 2 h postoperative, no. (range)	3.5 (0-8)	2 (0-10)	.03
Pain score on postoperative day 1, no. (range)	1.5 (0-8)	2 (0-10)	NS
Use of narcotics on the day of surgery (mg morphine equivalents)	8.5 (0-26)	6.7 (0-31.4)	NS
Use of narcotics on postoperative day 1	2.5 (0-21)	3.3 (0-18)	NS
Length of hospitalization, no. (range) d	1 (1-13)	1 (1-19)	NS
Minor adverse events, no. (%)	3 (17%)	7 (19%)	NS
Major adverse event	A contained leak at the GEJ requiring laparoscopic drain placement	Delayed esophageal leak requiring thoracotomy for drainage and repair	
Preoperative vs 6-wk postoperative LES basal and relaxation pressure (mmHg)	Basal: 19 (7-51) vs 9 (0-23) Relaxation: 21 (10-59) vs 12 (6-18)		Both .001
Timed barium esophagram column heights at 1, 2, and 5 min preoperative vs 6-wk postoperative, cm	17 vs 7 16 vs 5 14 vs 0		All ≤ .001

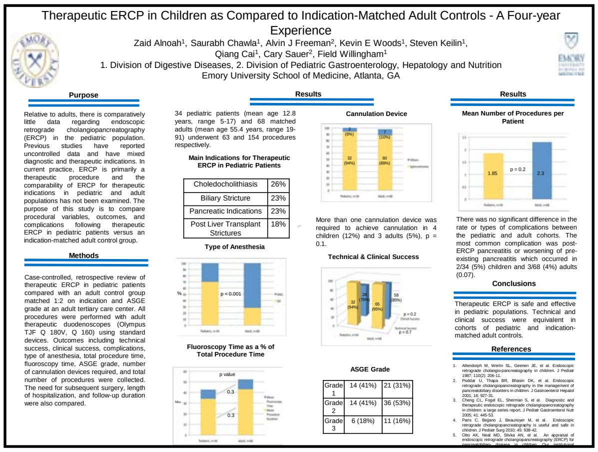
POEM, Per-oral endoscopic myotomy; LHM, laparoscopic Heller myotomy; NS, not significant; GEJ, gastroesophageal junction; LES, lower esophageal sphincter.



Background

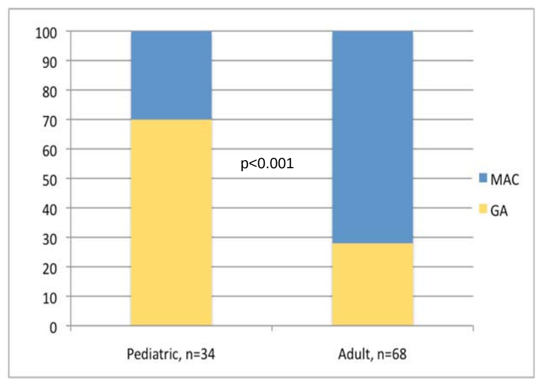
- Comparatively little data regarding endoscopic retrograde cholangiopancreatography (ERCP) in the pediatric population.
- Previous studies uncontrolled data & mixed diagnostic and therapeutic indications. In current practice, ERCP is primarily a therapeutic procedure.
- Purpose - to compare procedural variables, outcomes, and complications following therapeutic ERCP in pediatric patients versus an indication-matched adult control group.

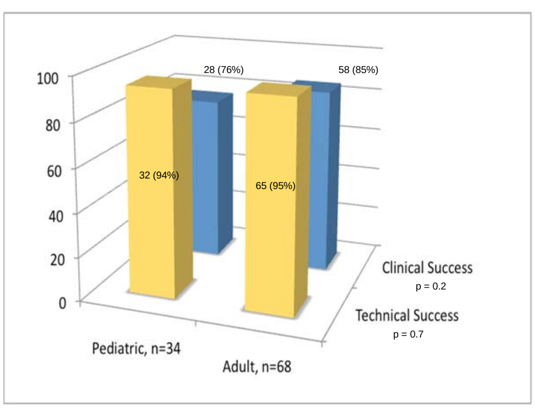
THERAPEUTIC ERCP IN CHILDREN AS COMPARED TO INDICATION-MATCHED ADULT CONTROLS, A FOUR-YEAR EXPERIENCE. Program No. P567. *ACG 2013 Annual Scientific Meeting Abstracts.* San Diego, CA: American College of Gastroenterology.


Therapeutic ERCP in Children as Compared to Indication-Matched Adult Controls - A Four-year Experience
Zaid Alnoah[1], Saurabh Chawla[1], Alvin J Freeman[2], Kevin E Woods[1], Steven Keilin[1], Qiang Cai[1], Cary Sauer[2], Field Willingham[1]
1. Division of Digestive Diseases, 2. Division of Pediatric Gastroenterology, Hepatology and Nutrition
Emory University School of Medicine, Atlanta, GA
Purpose
Methods
Results
Cannulation Device
Mean Number of Procedures per Patient
Conclusions
References

INDICATION	PERCENT
Choledocholithiasis	26%
Biliary Stricture	23%
Pancreatic Indications	23%
Post Liver Transplant Strictures	18%

Procedural Details	Pediatric n=34	Adult n=68	p value
Mean Procedure Duration (min)	34.1	43	0.3
Mean Fluoroscopy Time (min)	8.6	9.3	0.9
Fluoroscopy Duration (% Total Duration)	23.5	25.5	0.4
Cannulation Device Sphincterotome Other*	 32 (94%) 2 (6%)	 60 (88%) 7 (10%)	0.3
>1 Device Used for Cannulation	4 (12%)	3 (5%)	0.1
ASGE Grade Grade 1 Grade 2 Grade 3	 14 (41%) 14 (41%) 6 (18%)	 21 (31%) 36 (53%) 11 (16%)	0.5
Mean Number of Procedures/Patient	1.85	2.3	0.2
Complications**	3 (8%)	6 (8%)	0.7





Outcomes

- There was no significant difference in the rate or types of complications between pediatric and adult cohorts.
- Most common complication was post-ERCP pancreatitis or worsening of pre-existing pancreatitis which occurred in 2/34 (5%) children and 3/68 (4%) adults (0.07).
- Therapeutic ERCP is safe and effective in pediatric populations. Technical and clinical success were equivalent in cohorts of pediatric and indication-matched adult controls.

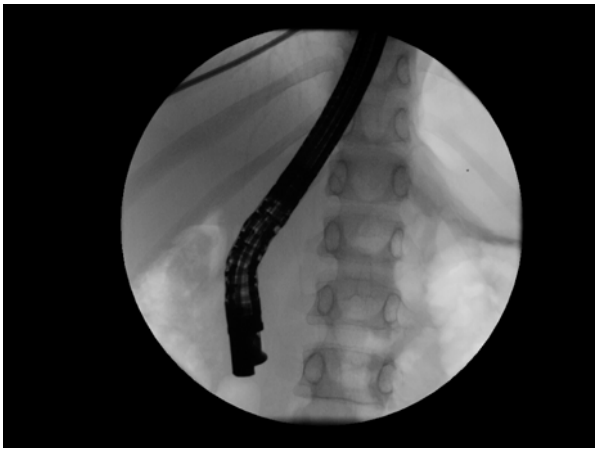
THERAPEUTIC ERCP IN CHILDREN AS COMPARED TO INDICATION-MATCHED ADULT CONTROLS, A FOUR-YEAR EXPERIENCE. Program No. P567. *ACG 2013 Annual Scientific Meeting Abstracts*. San Diego, CA: American College of Gastroenterology.

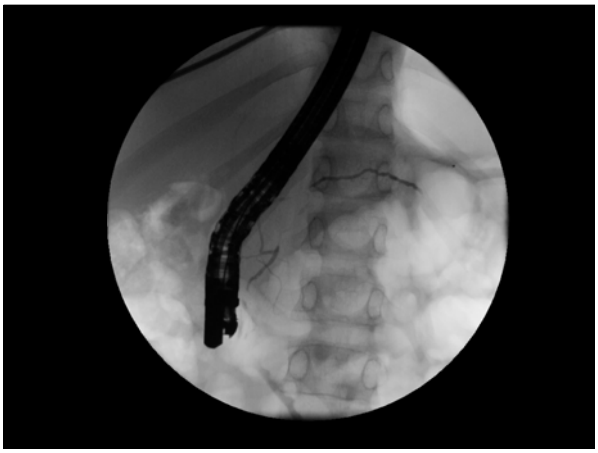
11 yo M presented for evaluation of a biliary stricture. H/o intermittent pruritis for two years.

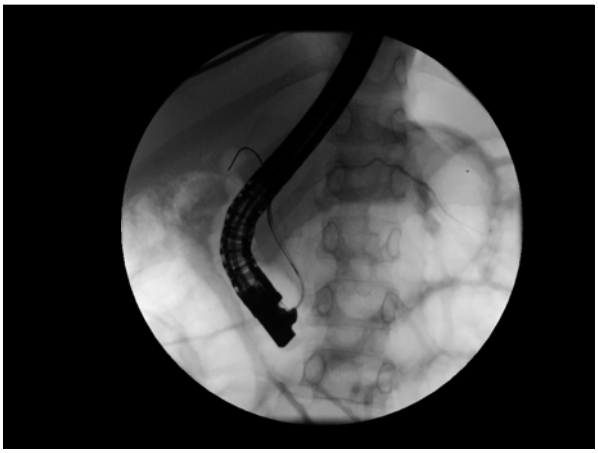
H/o major traumatic ATV injury secondary to a motor cross accident, complicated by atlantooccipital dislocation and cervical spine fusion, renal injury resulting in left nephrectomy, acute pancreatitis.

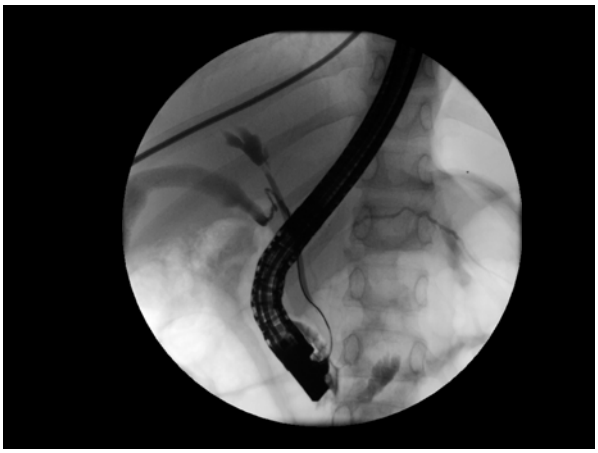
Organic/Inorganic			
Glucose Serum			* 81 mg/dL
Blood Urea Nitrogen			10 mg/dL
Creatinine			0.53 mg/dL
Bilirubin Total			0.5 mg/dL
Bilirubin Direct			0.1 mg/dL
Bilirubin Indirect			0.4 mg/dL
Protein Total			6.8 gm/dL
Albumin Level			4.0 gm/dL
Calcium Level Total			9.6 mg/dL
BUN/Creat Ratio			19
Other Enzymes			
Alkaline Phosphatase			* H 457 unit/L
Alanine Aminotransferase			H 59 unit/L
Aspartate Aminotransferase			H 66 unit/L
Gamma Glutamyl Transferase			H 212 unit/L
Hemogram			
White Blood Count		L 4.4 10E3/mcL	
Red Blood Cell Count		4.50 10E6/mcL	
Hemoglobin		12.8 gm/dL	
Hematocrit		37.1 %	
MCV		82.4 fL	
MCH		28.3 pg	
MCHC		34.4 gm/dL	
RDW		14.0 %	

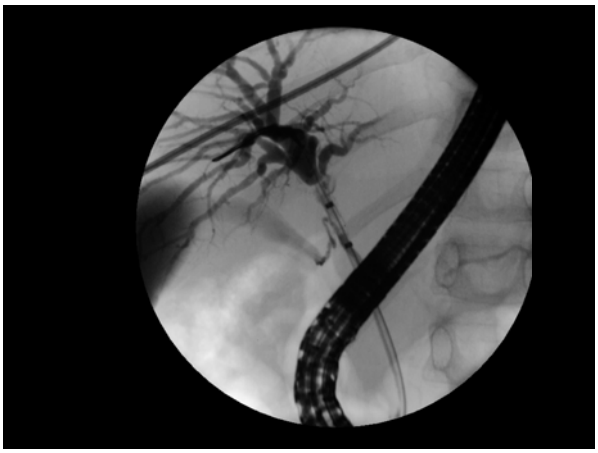
ERCP 1

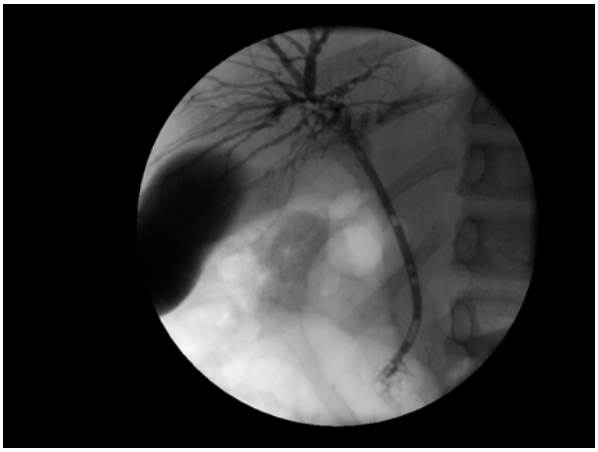




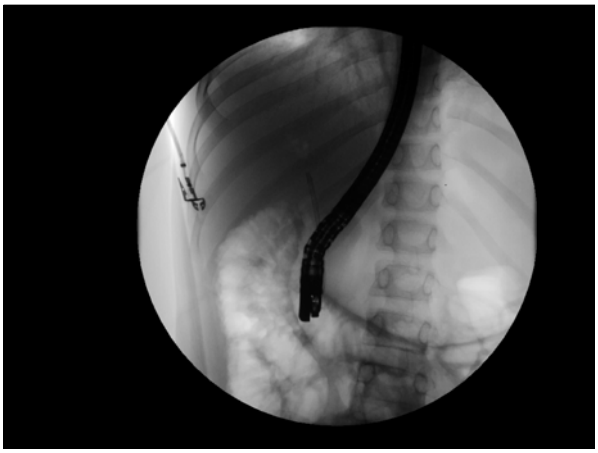


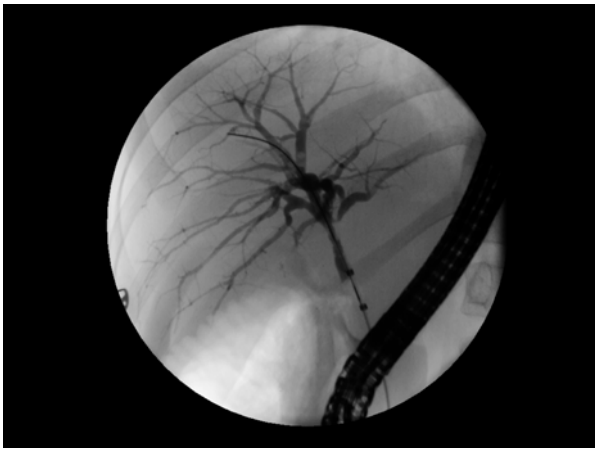


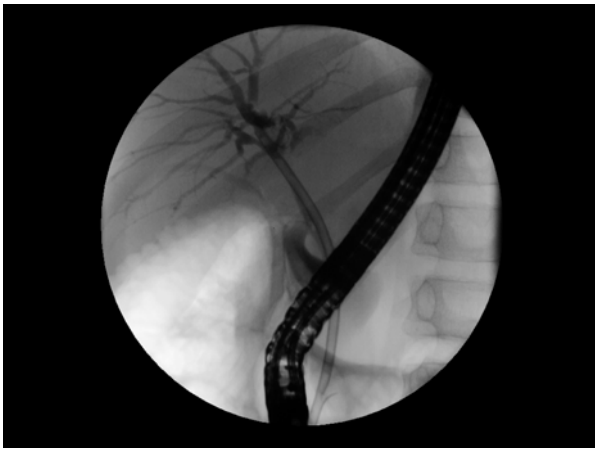




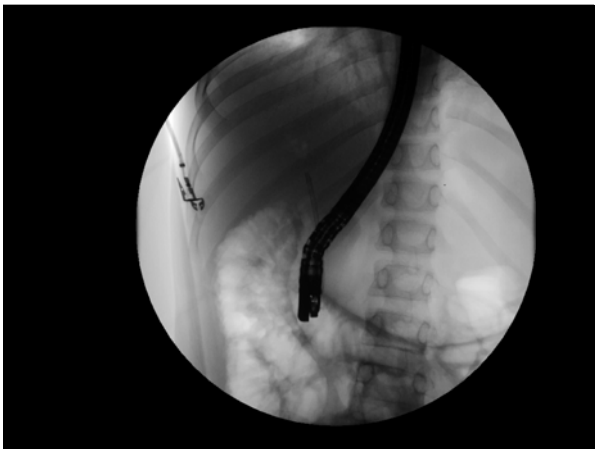
ERCP 2

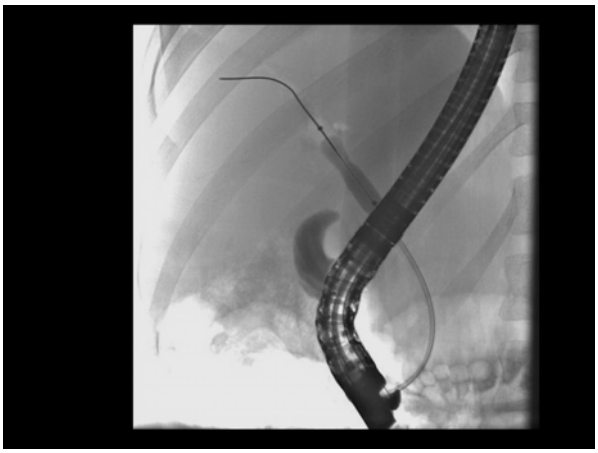


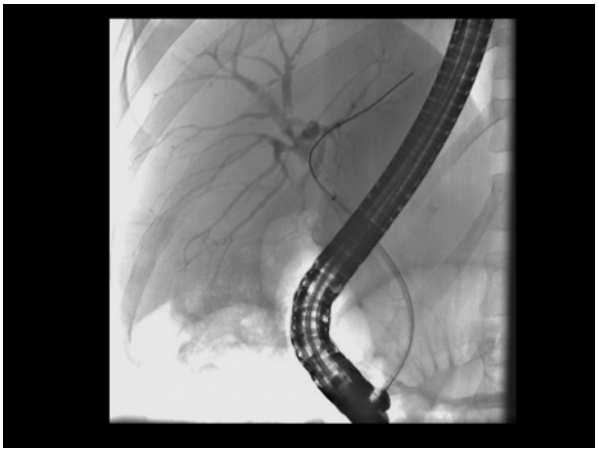


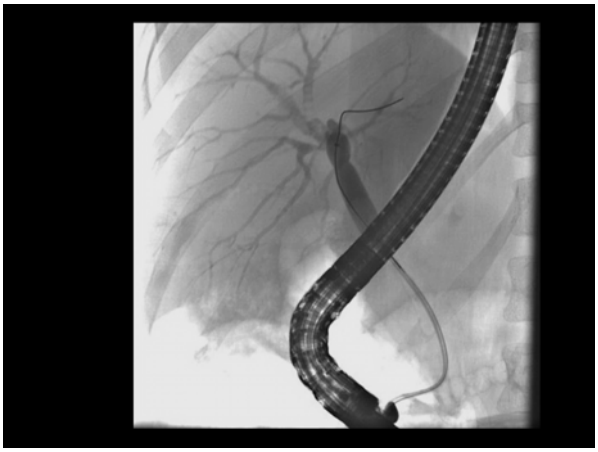


ERCP 3







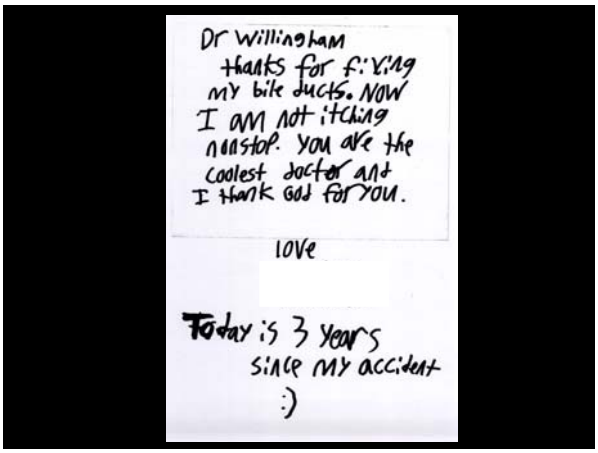


Hepatic Function Panel (7)

Protein, Total, Serum	7.1	g/dL	6.0 - 8.5	01
Albumin, Serum	4.5	g/dL	3.5 - 5.5	01
Bilirubin, Total	0.3	mg/dL	0.0 - 1.2	01
Bilirubin, Direct	0.06	mg/dL	0.00 - 0.40	01
Alkaline Phosphatase, S	340	IU/L	150 - 530	01
AST (SGOT)	32	IU/L	0 - 40	01
ALT (SGPT)	21	IU/L	0 - 55	01
GGT	48	IU/L	0 - 65	02

01	AT	LabCorp Tucker 1957 Lakeside Parkway Suite 542, Tucker, GA 30084-5882	Dir: John Elgin, MD
02	MB	LabCorp Birmingham 1901 First Avenue South, Birmingham, AL 35233-1935	Dir: John Elgin, MD

For inquiries, the physician may contact **Branch: 770-939-4811** **Lab: 770-939-4811**



NASPGHAN Annual Meeting & Postgraduate Course 2014

Advanced Endoscopy in Pediatric Populations

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Assistant Professor of Medicine

October 25, 2014

EMORY UNIVERSITY SCHOOL OF MEDICINE
Interventional Endoscopy

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