

Early Esophageal & Gastric Cancers: Opportunities for Minimally Invasive Therapy

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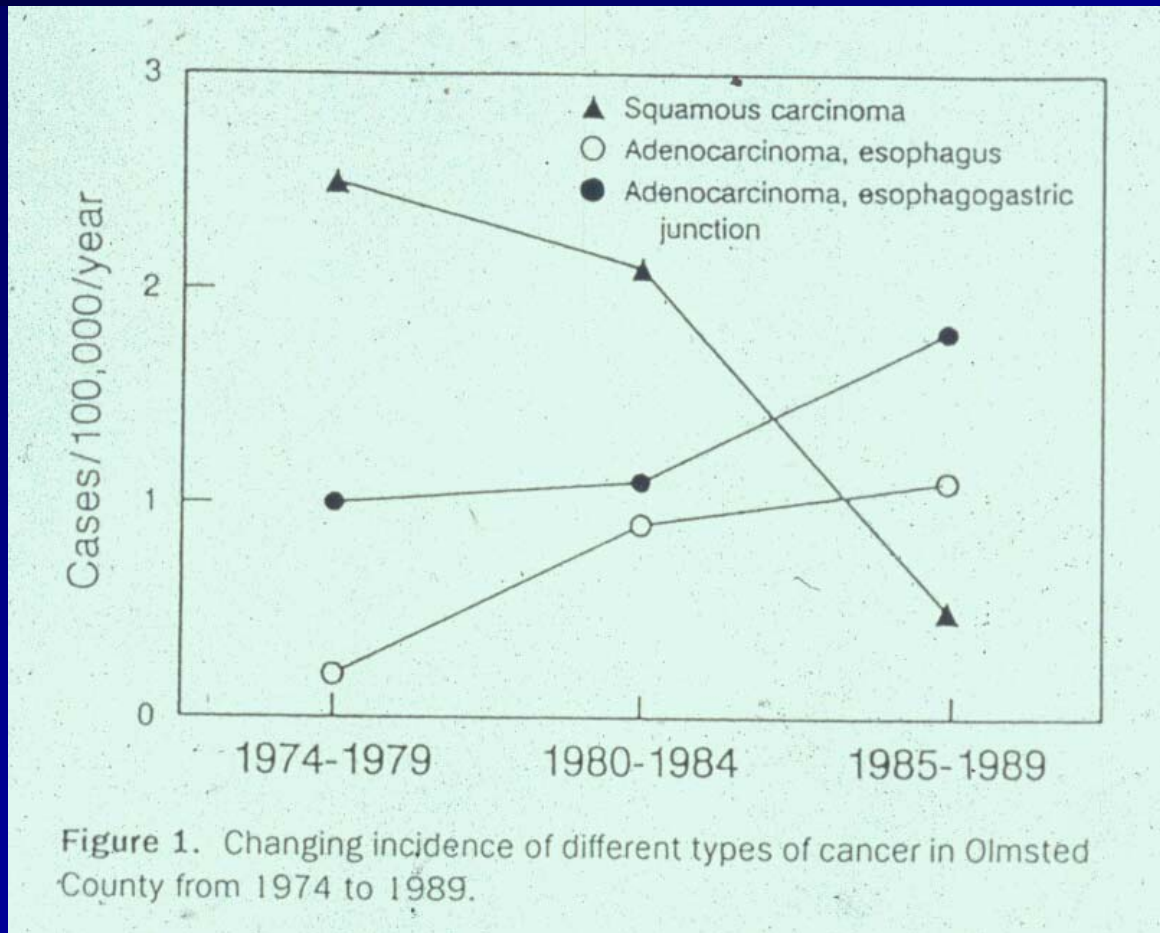
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Trends in Esophageal Cancer



- BMI
- Reflux
- Middle-age
- White males
- Mid-higher socio-economic class

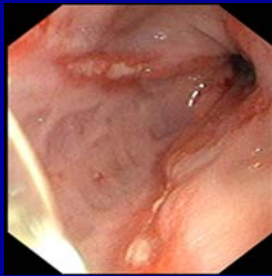


Esophageal Adenocarcinoma Sequence

Normal



Intestinal Metaplasia (Barrett's)



Barrett's Dysplasia

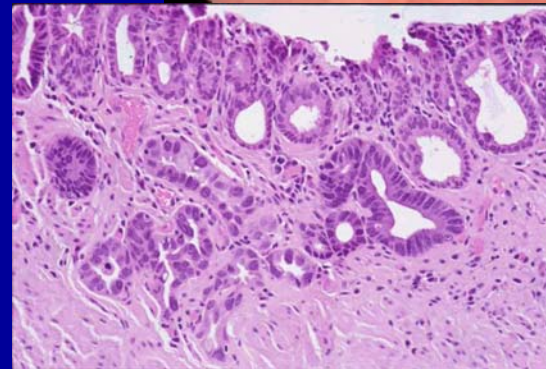
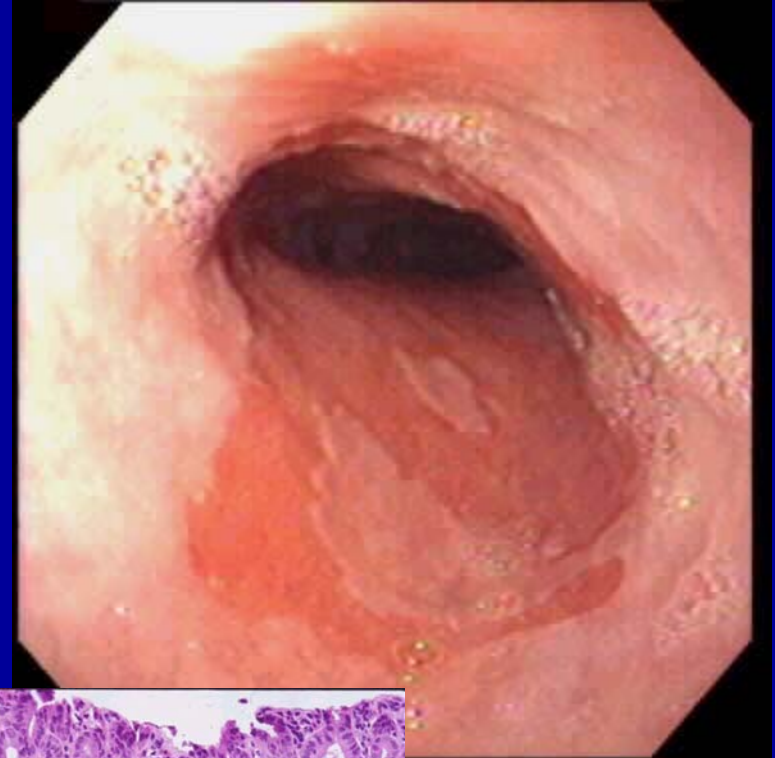


Cancer



Barrett's Esophagus

- Replacement of normal squamous mucosa
- Specialized Intestinal Metaplasia (SIM)
- Response to chronic GE-reflux
- Endoscopically recognizable
- Biopsy confirmed
- Common: 1-3% population
- Asymptomatic



Why Do We Care About Barrett's Esophagus?

- **↑ Adeno CA Esophagus & EG-J**
- Most, if not all, associated with Barrett's
- 30 to 125-fold increase cancer risk
- 1% - 5% life-time **(0.5% per yr)** cancer risk
- Barrett's **→** Dysplasia **→** Carcinoma
- Opportunity for screening, surveillance, and early detection
- **Progression to cancer is preventable with intervention**

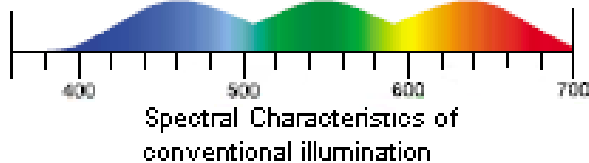


Conventional WL Imaging

Color CCD or Color Wheel

[FULL SPECTRUM]

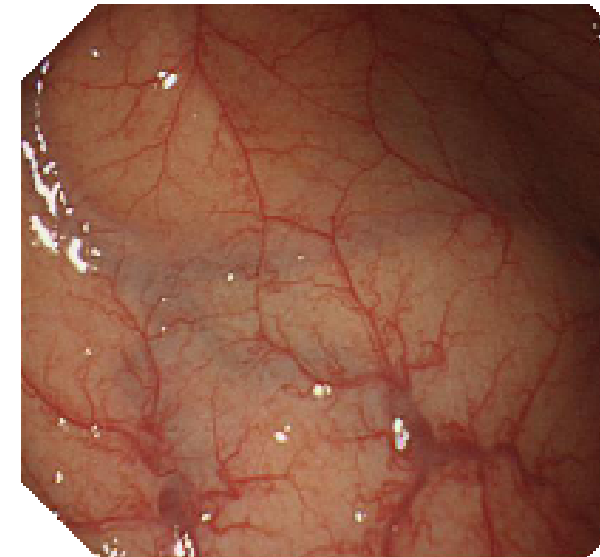
Short Wavelength
Shallow Imaging ↔ Long Wavelength
Deep Imaging



Conventional Illumination



Conventional Illumination



UV

IR

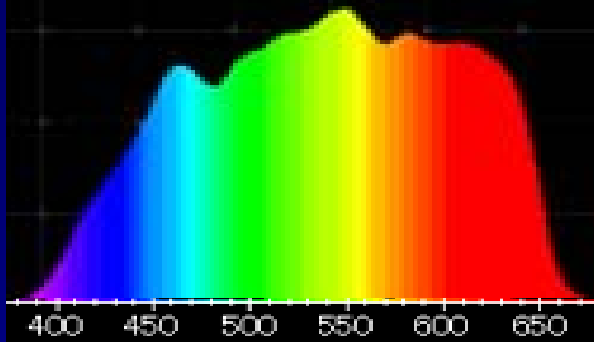
Visualization of mucosal surface coloration and topography under conventional full spectrum illumination



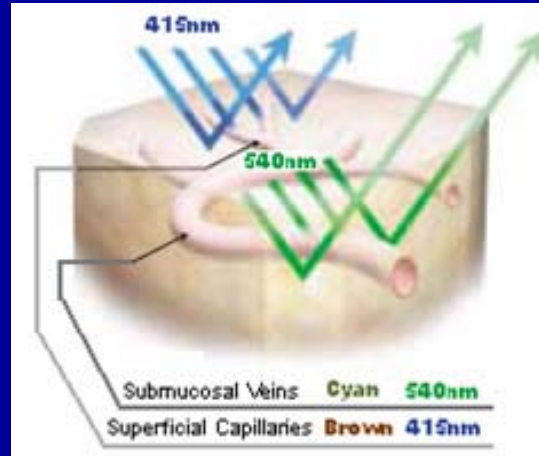
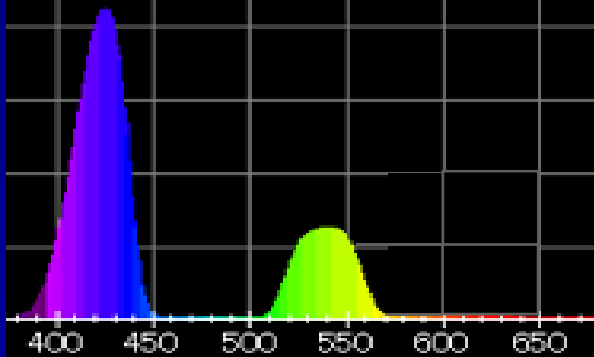
NBI – Principles

Short Wavelength ← Shallow imaging ↔ Long Wavelength Deep imaging

White light illumination



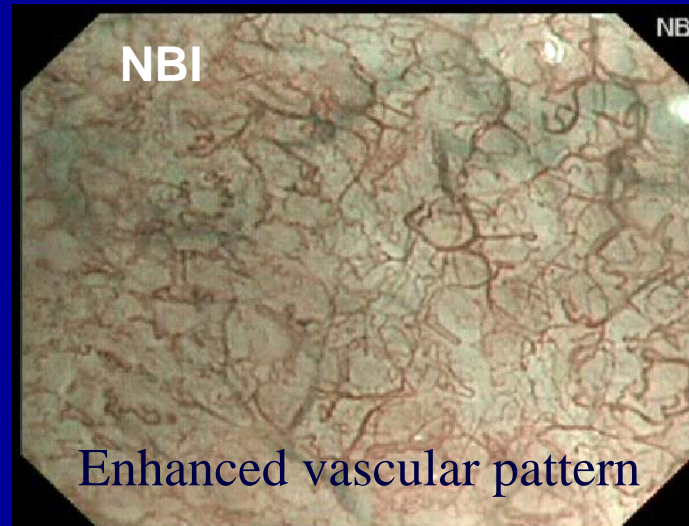
Narrow band illumination



WLE

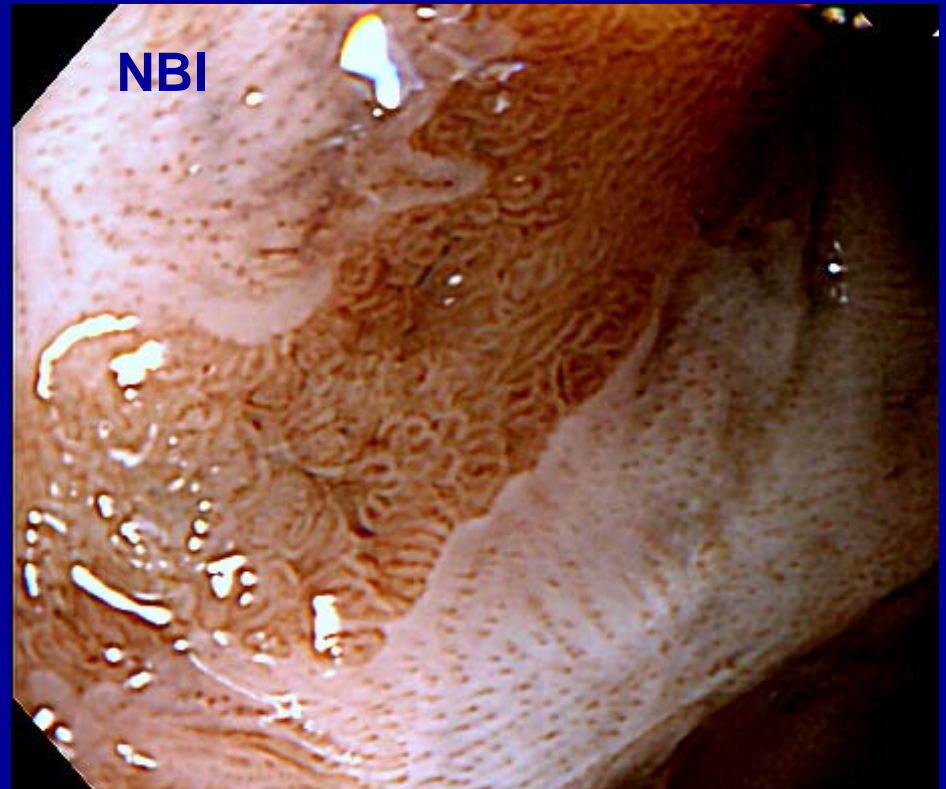
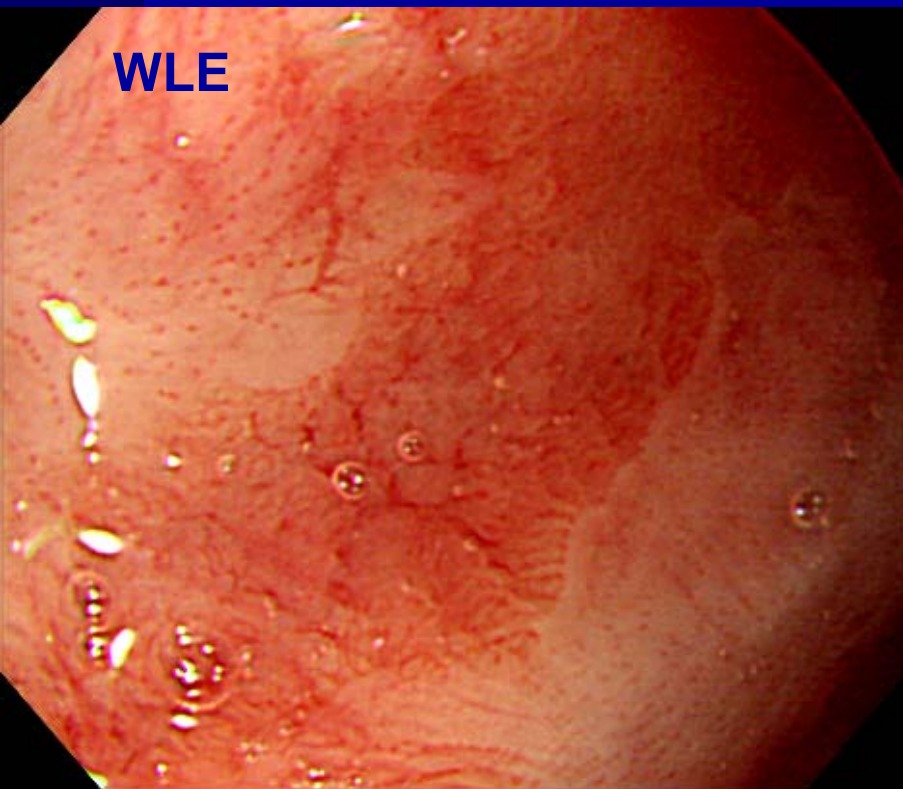


NBI

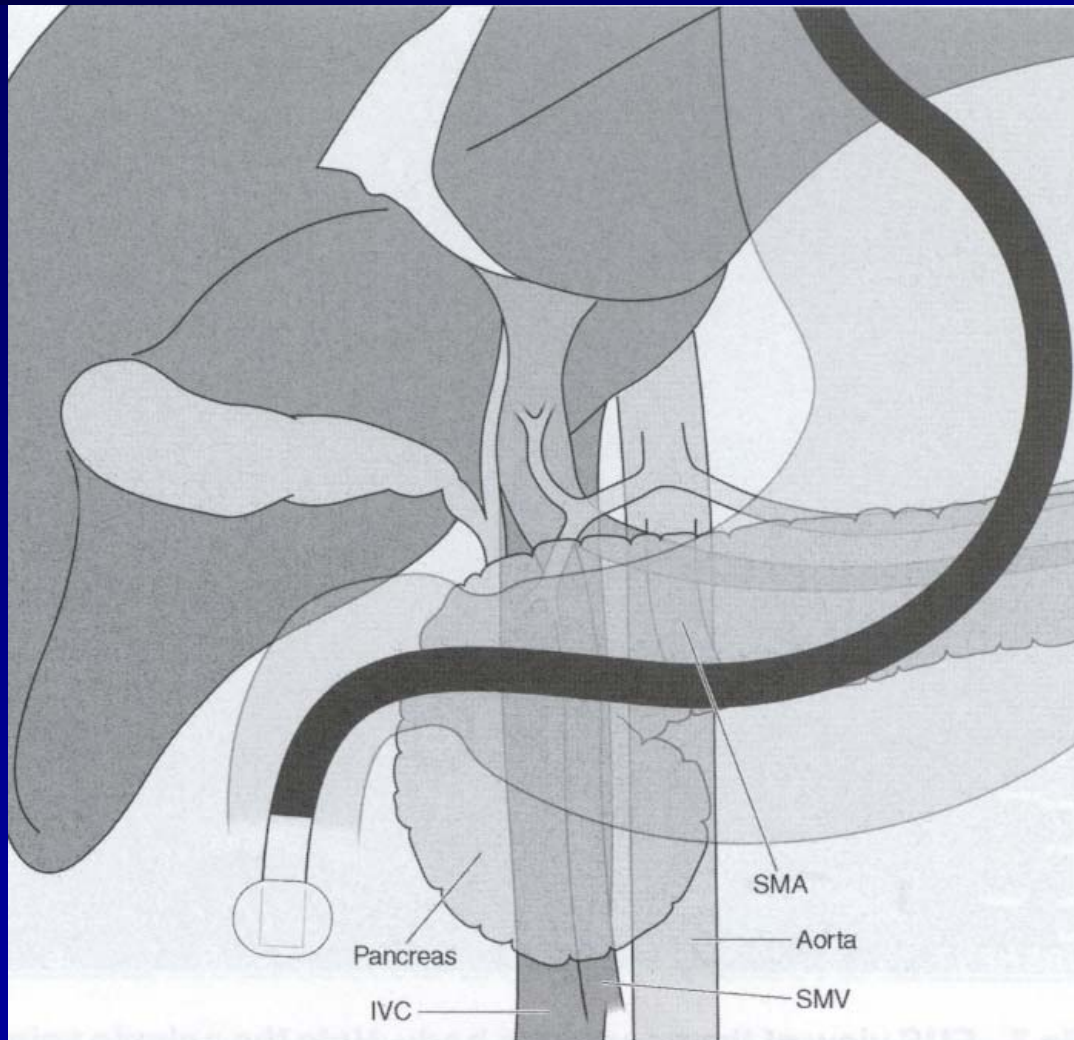


Filters peak Hgb absorption spectra

Barrett's Detection



Radial Scanning Endoscopic Ultrasound



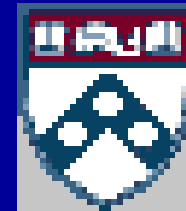
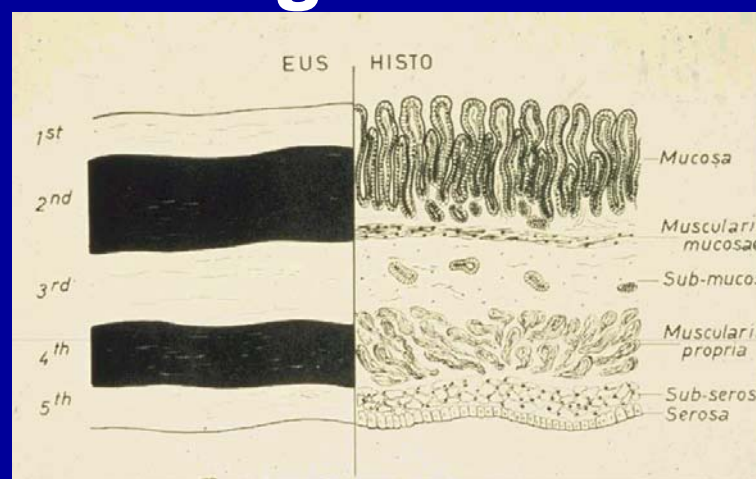
- Modified endoscope
- High frequency US
- 5, 7.5, 12, 20 MHz
- Close proximity
- Avoids: skin, fat, bone, bowel gas
- High resolution
- Real-time
- 3-D interrogation



EUS for Endoluminal Therapy

Scotiniotis, et al. GI Endosc 2001;54:689-696

- Detects wall layer thickening and disruption
- Depth of carcinoma
- Adenopathy
- Risk of metastasis
 - HGD = 0%
 - Mucosa = 1-3%
 - Submucosa = 30%
 - Muscularis Propria = 60%



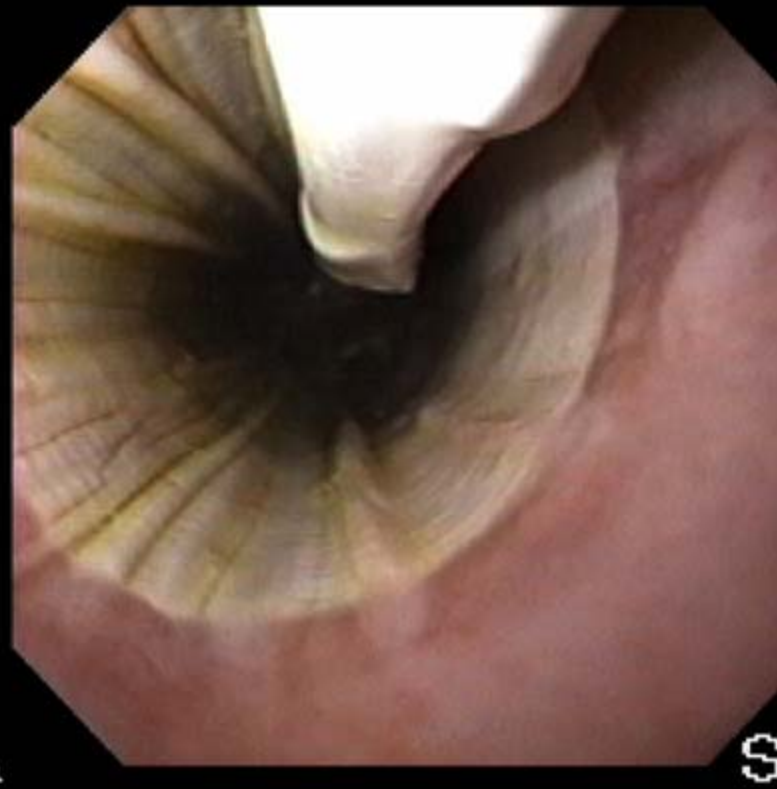
Endoscopic Therapies for Early Mucosal Cancer

- Ablation
 - Radiofrequency
- Resection
 - Endoscopic Mucosal Resection (EMR)
 - ◆ Provides histologic specimen for inspection (prognosticators)
- In presence of an-acid environment, re-squamation occurs



Radiofrequency Balloon-Based Ablation Therapy (BARRx)

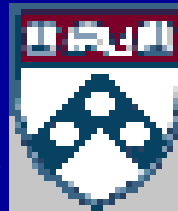
HALO 360°



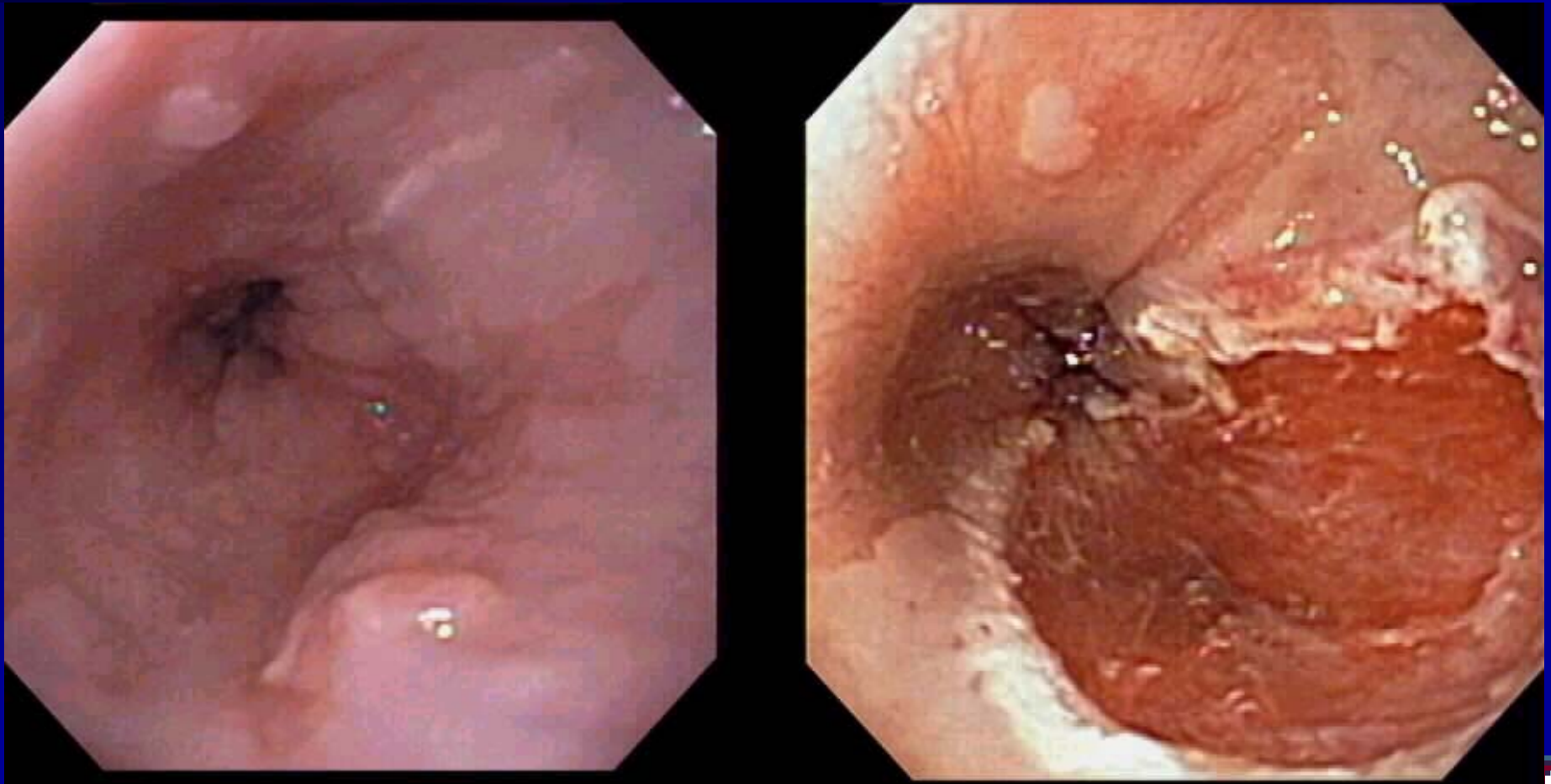
HALO 90°



- Uniform circumferential ablation
- 3 cm in length
- Individualized with sizing balloon
- Precise energy delivery in < 1 sec

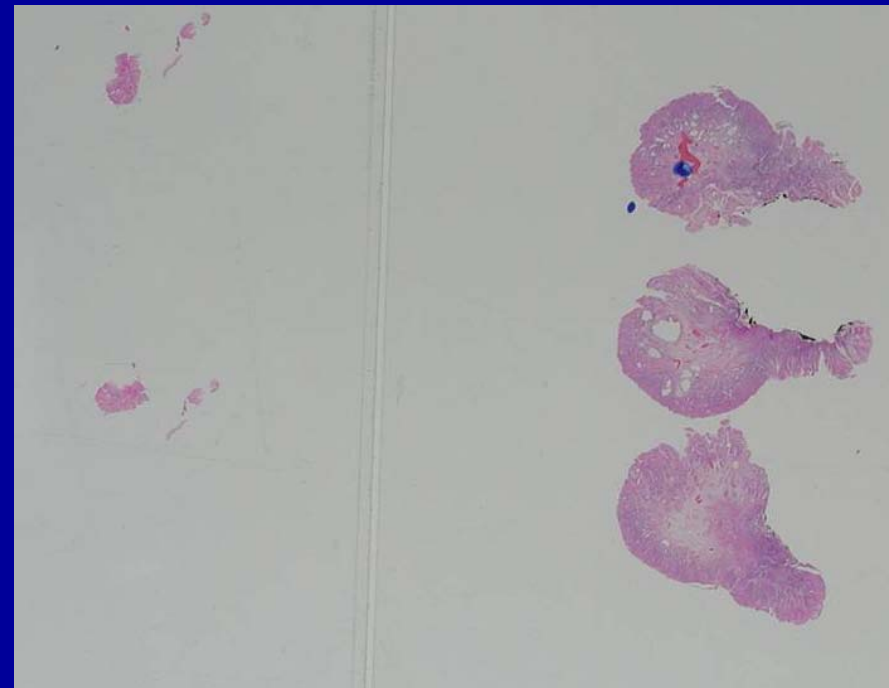


Endoluminal Resection (ELR) for Focal HGD/ImCa



ELR for Barrett's HGD/ImCa

- Focal macroscopically distinguishable lesions
- Wide area ELR
- Provides specimen for histological inspection
 - Depth of invasion
 - Margins of resection
 - Degree of differentiation
 - Lymphovascular invasion



Ahmad et al. GIE 2002;55:390-396.

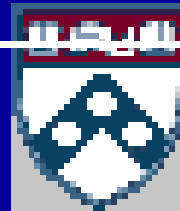
Nijhawan & Wang. GIE 2000;52:328-332.

Multimodal Endoluminal Therapy for Barrett's HGD/ImCa

Author	# pt Rx	Remission (%)	F/U (mo)	Recurrence (%)
Pacifico	24	20 (83%)	12 \pm 2	0
May	110	108 (98%)	34 \pm 10	34 (39%)
Buttar	17	16 (94%)	13 (3-48)	1 (6%)
Peters	28	26 (93%)	19 (13-24)	5 (19%)
Ginsberg	135	120 (89%)	32 (12-109)	8 (7%)

***** Follow up remains short *****

Modified from Peters et al GIE 2005;61:506



Early Esophageal & Gastric Cancers: Opportunities for Minimally Invasive Therapy

- There are increasing opportunities for minimally invasive therapies for early esophageal and gastric cancers
- Enhanced imaging improves detection of early lesions
- Accurate staging identifies suitable candidates
- First degree relatives may benefit from screening and surveillance

