Slide 1

Barrett's Esophagus in 2023

Dr. Milli Gupta
Associate Clinical Professor
University of Calgary
ASEP 2023

Slide 5

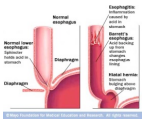
Objectives

- Understand who should be considered for Barretts (BE) screening and the evidence pertaining to programmatic BE screening
- Recognize BE endoscopically, how to properly document the extent of BE and ensure appropriate biopsies
- Appropriate surveillance intervals for BE patients
- Who to refer for therapy of BE and to whom (programs in Alberta)

Slide 6

Introduction to Barrett's

- Barrett's Esophagus (BE) is a premalignant condition of the esophagus that can develop into Esophageal Adenocarcinoma (EAC)
- GERD is **one proposed** pathway for development of BE
- Obesity /metabolic syndrome is another



Slide 7

Why does Barrett's Matter

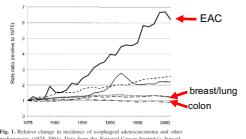
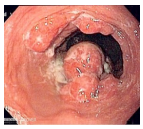
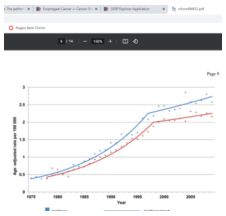


Fig. 1. Relative change in incidence of esophageal adenocarcinoma and other malignancies (1975–2001). Data from the National Cancer Institute's Surveillance, Epidemiology, and End Results program with age-adjustment using the 2000 U.S. standard population. Baseline was the average incidence between 1973 and 1975. **Solid black line** = esophageal adenocarcinoma; **short dashed line** = melanoma; **line** = prostate cancer; **dashed line** = breast cancer; **dotted line** = lung cancer; **dashes and dotted line** = colorectal cancer.



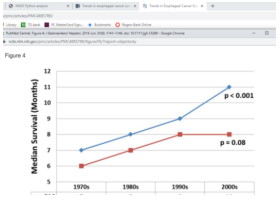
Pohl, H. et al. J Natl Cancer Inst 2005;97:142-146

Slide 8



Incidence and Mortality EAC only

Slide 9



Median Survival in EAC

Slide 10

Risk Factors for Barrett's

Unreversible
- Male Gender
- White race
- Increasing Age
- FMHx
- Genetics

Reversible
- GERD
- Obstructive Sleep Apnea
- Metabolic Syndrome
- Obesity
- Smoking

Slide 11

Stages of development in BE

- Proposed step wise but due to patchy nature of disease, may not be detected in this pattern
- Non-dysplastic (ND)
- Low-grade dysplasia (LGD)
- High-grade dysplasia (HGD)
- Intramucosal carcinoma (IMCa)
- Esophageal Adenocarcinoma (EAC)

Slide 12

Screening

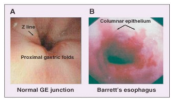
- Chronic GERD symptoms (>10y) + 3 or more additional risk factors:
  - Male gender,
  - Age >50,
  - White race,
  - Current or Past hx of Tobacco smoking,
  - Obesity – waist circumference >88cm(women) or >102 cm (men)
  - FMHx BE/EAC
- Repeat screening is not needed if first EGD is negative.
- Continue GERD mgt

ACG 2022 guidelines

Slide 13

Diagnosis

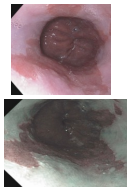
- >1cm columnar mucosa extending about GEJ + metaplastic columnar epithelium on biopsies.
- Intestinal Metaplasia documented should be in the esophagus.
  - Columnar mucosa on pathology is likely pending evolution to IM, but cannot give 'official' diagnosis until IM detected.
- Don't biopsy if normal GEJ or <1cm extension of columnar mucosa



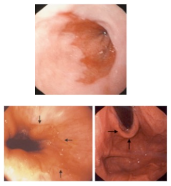
ACG 2022 guidelines

Slide 14

Barrett's Esophagus versus IM GEJ



Prevalence : 1.5-2%

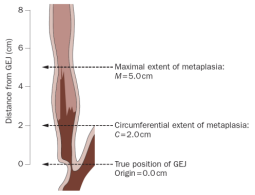


Prevalence : 10-15%

Does not carry same risk for cancer as BE

Slide 15

Prague C & M Classification



Slide 16

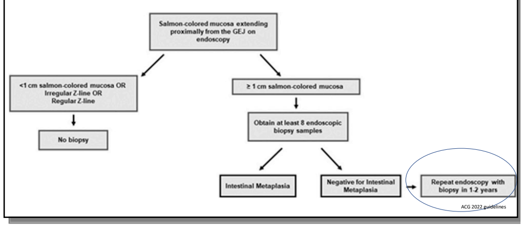
Monitoring

- Structured biopsy protocol is essential to minimize bias and improve detection of dysplasia
  - Seattle protocol biopsies – 4 quadrant biopsies every 1cm; or 8-10 biopsies every 2cm
  - Submit separate bottles for each level of biopsies taken.
- Blood tests and novel tech to capture more tissue still experimental and not clinically available
- Continue surveillance of BE until patient willing to consider treatment.
- Follow up EGDs frequency depends on baseline dysplasia

ACG 2022 guidelines

Slide 17

Summary of monitoring



ACG 2022 guidelines

Slide 18

Predictors of progression to dysplasia

- Age at diagnosis of Barrett's (YOUNGER > OLDER)
- Gender (M>>F)
- Grade of Dysplasia
  - HGD>>LGD>>>>ND
- Nodular BE
- Length of segment (long >short)
- As length increases, so does risk of dysplasia, EAC
  - 14-17% increased risk PER cm of added length
  - > 10cm is a significant threshold
- Duration of BE

Hage M. Scand J Gastroenterol 2004
Gopal DV. Dig Dis Sci 2003
Avidan B. AJG 2002
Weston AP. AJG 1997

Slide 19

BE and EAC: Protective Factors

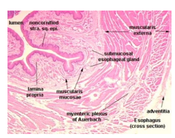
- PPIs
  - Observational studies demonstrate PPIs reduce risk of neoplastic progression by 71%, but results from different studies are heterogeneous
  - ASPECT Trial showed BID > OD PPI use.
- Statins
  - In all patients, EAC risk reduced by 28%,
  - In BE subset, 41% reduction in EAC (Meta analysis)
- ASA or NSAIDs
  - In combination with PPi, ASA effective but not if background hx of NSAIDs.
  - However, other studies show NSAIDs reduce genetic instability.
- Intake of the anti-oxidant vitamins A, C, and E inversely associated with EAC
  - Not enough data to recommend for general use

Freedman et al., Gut 2011
Kubo et al., AJG 2007
Singh et al., Gut 2014
Singh et al., CGH 2013
Jankowski et al., Lancet 2018

Slide 20

Management Goals in Barrett's

1. Treatment of associated GERD
   - PPi BID therapy, weight loss, anti reflux surgery, dietary modification, etc.
2. Endoscopic surveillance to detect dysplasia
   - Rigorous biopsies and frequent EGDs
3. Treatment of dysplasia
   - Endoscopic and surgical
4. Avoid recurrence of dysplasia
   - Surveillance program



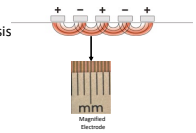
Slide 21

Radio Frequency Ablation

Slide 22

Principles of RFA

- Alternating electrical current induces a local EM field causing charged ions to rapidly oscillate
- This creates molecular friction and an exothermic release of energy
- Allows for a controlled thermal injury leading to water vaporization, coagulation of proteins and cell necrosis
- Seamless contact between the probe and mucosa is crucial for effective ablation



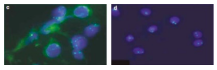
Slide 23

RadioFrequency Ablation Summary

Slide 24

Effects of RFA on molecular level

- Neosquamous epithelium
  - Clonal abnormalities reversed



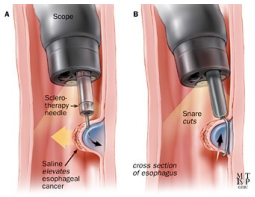
	BE	Neo-Squamous
↑Ki-67	90%	0%
abN p53 expression	100%	0%
Loss of p16	20%	0%
Loss of p53	40%	0%
Gain of chromosome	40%	0%

Pouw RE. AJG 2009

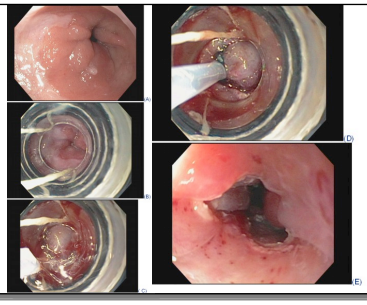
Slide 25

Endoscopic Mucosal Resection

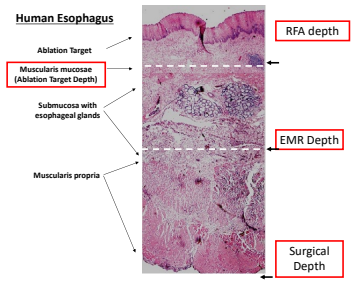
- Advanced endoscopy technique
- Allows for complete resection of a nodular or raised mucosal lesion without perforation of the esophageal wall



Slide 26



Slide 27



Slide 28

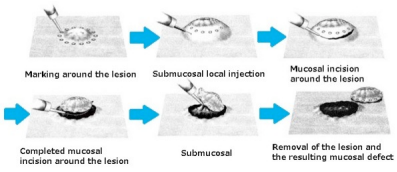
Endoscopic Submucosal Dissection (ESD)

- Used for widespread T1a and some T1b lesions

Yang et al., GIE 2016

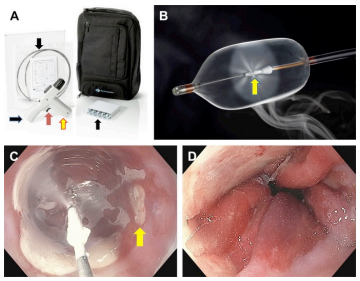
Slide 29

Another view of ESD



University of Tokyo News letter

Slide 30

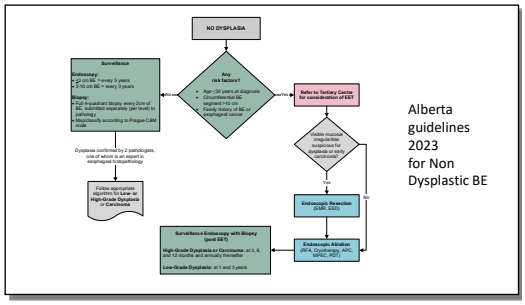


Cryotherapy

- Useful in RFA refractory cases
- Coming to Alberta soon*
  - Edmonton and Calgary

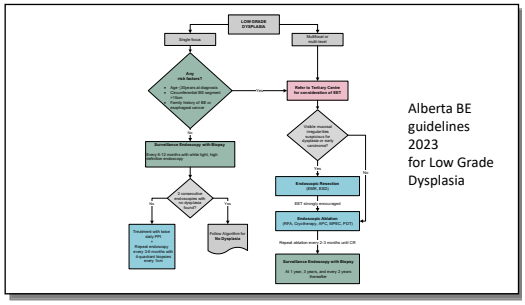
Canto, Gastro Endo Clin 2017

Slide 31



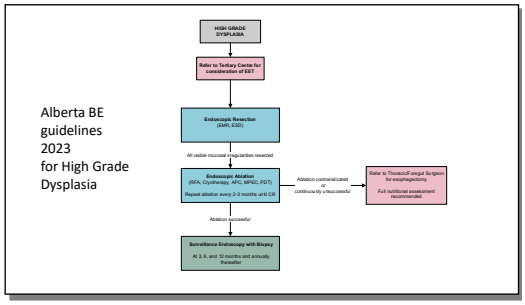
Alberta guidelines 2023 for Non Dysplastic BE

Slide 32



Alberta BE guidelines 2023 for Low Grade Dysplasia

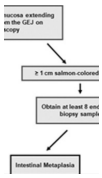
Slide 33



Alberta BE guidelines 2023 for High Grade Dysplasia

Slide 34

Indefinite dysplasia



ACG 2022 guidelines

Slide 35

If you are willing to accept a 1/1,000 risk of recurrence with invasive EAC,

- NDBE: From annual to every seven years
- LGD: From every six months to year 1, year 3, and year 5
- HGD/IMC: From q3 mos x 1 yr, q6 mos x 1 yr, then annually to month 3, month 6, then annually

Cotton CC et al, Gastroenterology 2018.

Surveillance Post Endoscopic Eradication Treatment