

GASTRO-OESOPHAGEAL REFLUX DISEASE

GOR: symptoms caused by pathological reflux of duodenal/gastric contents into oesophagus

GORD: GOR + mucosal damage NERD: endoscopically normal with GOR symptoms

Epidemiology

Misreporting: normal physiological phenomenon in awake, upright, post-prandial humanoids

Aetiology

Failure of distal oesophageal reflux barrier/increased acid or bile load/downstream resistance

LOS hypotension: (i)DRUGS (CaChB/nitrates/anti-Ach) (ii)SMOKING(iii)EtOH (iv)CAFFEINE (v)PREGNANCY: P₄ (iv) LOS hypotension

Loss of mechanical barrier: (i)HIATUS HERNIA: loss of pinchcock/intra-abdo segment/angle of His_(66% get GORD) (ii) OBESITY_(AoH)

Hyperacidity: (i)H. pylori (ii)DIETARY: food/booze (iii)ZES

Intra-abdominal pressure: (i)PREGNANCY (ii)OBESITY

Delayed gastric emptying: (i)DIABETES (ii)HYPOTHYROIDISM (iii)OBESITY

Pathology

TLOSR: LOS relaxes separate from swallow || Pathological TLOSR: 90% of reflux episodes; later disease= LOS hypotension itself; HH eventually

Acid: H⁺ enters cytosol, disrupts homeostasis → apoptosis/noci+chemoceptors in intercellular spaces/distal oes spasm

Clinical features

1a **TYPICAL:** heartburn/regurgitation_(microaspiration→cough/asthma)/acid brash

1b **ATYPICAL:** non-heartburn pain/cough/hoarseness/other: pharyngitis, tonsillitis, sinusitis

Worse on (i)bending over (ii)supine (iii)night (LOS relaxed/supine) || Better with PPI?

2. **Complications:** oesophagitis/stricture/bleeding/cancer

3. **Cancer red flag symptoms** _(age>55/blood/dysphagia/odynophagia/wt loss/mass/<6mths/>5yrs)

EROSIVE: responds to acid suppression NERD: atypical symptoms with variable response BARRETT'S: minimal symptoms

Complications

1. **EROSIVE OESOPHAGITIS/ULCER:** full dose PPI 8 weeks then maintenance (NICE)

2. **BENIGN STRICTURE:** (i)"stretch": dilatation_{+/-repeat} (ii)steroid (iii)stent (iv)surgery NICE: long-term PPI after dilatation

3. **BARRETT'S OESOPHAGUS:** intestinal metaplasia replaces damaged squamous epithelium

4. **ADENOCARCINOMA**

5. **BLEEDING**

INVESTIGATIONS

1. **OGD:** diagnostic_(visualise oesophagitis and complications/biopsy) + therapeutic

Savary-Miller: 1=erythema.oedema 2=linear erosion 3=circumferential erosion/superficial ulcer 4=complications eg stricture

2. **BARIUM(DCS)** (i)**Complications**_(stricture/cancer) (ii)**Anatomy**_(HH) (iii)**Function**_(motility/gastric emptying) *poor demo of reflux if intermittent/low volume*

3. **pH STUDIES:** (i)TYPICALS refractory to treatment (ii)ATYPICALS (iii)suspect motility disorder

Principle(a)Probe: **pH<4** as reflux episode; normal total reflux time **<5%/24hr** (b)Patient: **symptoms/dietary intake/position**

Tekkers: (a)**24Hr Ambulatory** (b)**BRAVO** _{wireless capsule + probe + RF transmitter 6cm above GOJ; better tolerated so longer (>96hrs) test}

DeMeester score: # of episodes/>5min episodes/total reflux time/longest episode/upright+supine time+total time (<14.42 normal)

Limitations: normal study doesn't rule out GORD: non/weakly acid refluxate

4. **OESOPHAGEAL IMPEDENCE:** *resistance to AC to differentiate (i)state of refluxate (ii)direction, velocity, time, extent of flow*

Liquid improves conduction, impedance decreases || gas impairs conduction, impedance increases

Information: fluid v gas/swallow vs reflux/proximal extent of reflux/velocity/time to clear/re-reflux episodes *NOT VOLUME*

*Combine with ph studies → most sensitive GORD measurement (reflux detection and symptom correlation)

*Especially useful if normal pH (?weakly acidic/duodenogastric)

5. **MANOMETRY:** *exclude dysmotility/motility disorder (eg achalasia, diffuse oes. spasm) before fundoplication*

(a)**STANDARD STATIC MANOMETRY:** multiple sensors ax peristalsis (normal/non-peristaltic/simultaneous) + LOS (rest/squeeze)

10 wet swallow test: UOS/LOS relax → 1° peristalsis (segmental contraction wave 5cm/s; 180mmHg distally)

3 limitations: test conditions /miss intermittent dysmotility/miss dysmotility between sensors

(b)**HIGH-RESOLUTION MANOMETRY:** more (36) sensors so more closely spaced for more comprehensive assessment

MEDICAL MANAGEMENT

Lifestyle: elevate bed/weight loss/dietary measures to reduce acid and LOS hypotension

LOS: avoid LOS hypotensives (CaCHBs/nitrate/anti-ACh/caffeine/smoking/EtOH) + lose weight

Gastric emptying: (i)treat DM/hypoT4 (ii)weight loss (iii)cisapride

Intra-abdominal pressure: weight loss

Hyperacidity: (i)H. pylori eradication (ii)ZES (iii)PPI (iv)diet

Mechanical barriers: weight loss to restore angle of His/operate on HH

Drugs (NICE 2014)

PPI: Full-dose 4-8wks converts acid reflux to non-acid reflux but still have volume reflux (**H2RA** switch if non-response; less effective)

Parietal cell hyperplasia so symptoms recur on cessation + atrophic gastritis with intestinal metaplasia in H. pylori

Cisapride: only prokinetic shown to be better than placebo

SURGICAL MANAGEMENT: FUNDOPLICATION

Principle: (i)create effective barrier to reflux at GOJ (ii)reduce TLOSRS Doesn't reliably lead to regression of Barrett's/adenocarcinoma risk

Indications:

1. Objective evidence of pathological reflux +/- complications

2a Refractory reflux despite adequate pharmacological therapy Poorer outcome (56% success at 11yrs); true non-responders ?alternative diagnosis

2b Medically-responsive reflux but unwilling to take medications for life Better response if symptom relief with acid suppression (77.1% success at 11yrs)

Contraindications (i)Oesophageal Ca (ii)Barrett's HGD (iii)Motility disorder *dysmotility/gastric outflow not absolute contraindications → partial wrap*

Workup: OGD/pH/impedence/manometry **Barium swallow not mandatory unless reoperation*

Procedures

1.Nissen: posterior fundus passed behind oesophagus and fixed to **anterior fundus**

2.Posterior Partial: Toupet posterior 270° fundus passed behind oesophagus + fixed to **lateral oesophageal walls**

3. Anterior Partial:

Dor: fundus passed anteriorly and fixed to **lateral oesophageal walls**

90°: fundus fixed to **left anterolateral oesophageal wall +posterior oesophagopexy**

120°: fundus fixed to **right anterolateral oesophageal wall**

180°: fundus fixed to **right + left hiatal rim +posterior oesophagopexy**

Dysphagia: universal in first few weeks; if persists may be tight hiatus (scarring or overtightening → dilate/cut hiatal rim)

Gas-Bloat: one-way valve prevents belch/vomit → flatulence;

Reflux:

Procedure-specific outcomes

Nissen vs posterior: posterior= less gas-bloat; dysphagia similar in Toupet with; reflux higher

Nissen vs anterior: 90°/180°= less dysphagia/gas-bloat but more reflux

Wrap length important: 3cm>1.5cm>1cm

Patient-specific Outcomes

1. Responders vs non-responders: 77.1% success at 11yrs in responders vs 56% ?alternative diagnosis in true non-responders

2. Typical vs atypical: 85% overall in typicals vs 41% overall in atypicals ?alternative diagnosis in true atypicals

Complications

General: DVTPE/infection: pericardial, mediastinal, peritoneal, LRTI/bleeding/

Dissection: pneumothorax/pneumomediastinum/perforation of oesophagus, stomach, duodenum/liver injury

Mechanical: sliding HH/hiatal stenosis (scarring, overtightening)/bilobed stomach

Failure after surgery

1. Recurrent reflux: wrap disruption/slippage/migration_{esp if large HH defect} → repeat physiology ?true reflux

2. Persistent pain: original diagnosis of pain wrong → review physiology studies

3. Gas-bloat: usually air-swallowers or FGID but vagotomy can be cause → pyloric dilatation/roux-en-Y

4. Dysphagia: (i)persistent after op= motility disorder missed/tight wrap/tight hiatus (ii)after normal swallowing period= wrap related/hiatal scarring/cancer

Ix: OGD: de novo path/Ca/wrap/hiatus || Barium: wrap/hiatus/gastric emptying || CT: HH || Mano: missed motility disorder/dysmotility || pH studies: other dx

BARRETT'S OESOPAGHUS

Definition: Any portion of normal distal oesophageal squamous epithelium with metaplastic columnar epithelium

Must be (a) endoscopically **visible** (1cm above true GOJ) and (b) confirmed by **biopsy**

Aetiology: (i) Reflux (12% of GORD) and (ii) non-reflux

Pathogenesis: adaptive to acid/alkaline reflux causing squamous cell damage; *p53/p16 (TS)* induced by → clonal expansion

Diagnosis

Endoscopy: **Prague** (CxMx) and **Paris** (lesions); **2cm quadrantic biopsies**; any nodular lesion is cancer until disproven

Histo: (i) **LGD**: loss of goblets/loss of differentiation (ii) **HGD**: pleomorphism/loss of crypts (iii) **IMN**: invades lamina propria (T1)

Genetics: **p53** testing

Risk of cancer progression **<1%/yr**; depends on (i) **length** (ii) **H/LGD** (iii) **intestinal/cardiac/fundic metaplasia**

Screening

Not feasible in general population (Barrett's common with low risk of progression)

Indicated if GOR with risk factors: **3+ of >50/male/white/obese**

1. Surveillance of intestinal metaplasia (RCT data lacking but recommended if intestinal metaplasia)

(i) <3cm without IM/dysplasia → **rpt** → **discharge** if normal (ii) <3cm with IM → **3-5yrly** scope (iii) >3cm with IM → **2-3yrly** scope

2. Management of dysplasia

(i) INDEFINITE FOR DYSPLASIA: PPI + repeat 6mths → if normal repeat 6mths then treat as non-dysplastic (2-3/3-5yrly)

(ii) LGD: PPI + repeat 3mths → 6mthly scopes if persistent *EMR for visible lesions
→ 2yrly scopes if regresses *RFA for flat lesions

(iii) HGD: 2nd GI pathologist confirmation/quadrantic 1cm biopsies/staging including diagnostic EMR/MDT

EMR visible lesions (95% remission; 14% metachronous lesion at 12mth) || **RFA** dysplasia without visible lesion (81% remission)

Oesophagectomy: M&M less than with invasive cancer; optimal staging; complete removal → no surveillance

Follow-up

Lifelong endoscopic surveillance if endotherapy (not if oesophagectomy)

RFA:

Reduces progression of HGD to cancer

Ablate entire Barrett's segment (metachronous recurrence 20% at 2yrs) not just dysplasia

Risks: stricture/bleeding/perforation + treatment failure + recurrence

GORD HISTORY

Pc: Symptoms

HPc (i) GOR (typical/atypical/PPI response (ii) Complications (stricture, bleeding, ulcer, cancer) (iii) Cancer (iv) motility/dysmotility

PMHx: Barrett's/cancer treatment + DM/thyroid for delayed gastric emptying

MedX: acid ie NSAIDS/steroids/EtOH/smoking; LOS relaxant ie caffeine/smoking/EtOH

FHx: Barrett's/oes cancer/HH

SHx: occupation and ethnicity for oes ca risk; diet