Gastric Bezoar

Introduction

Universal antidote against any poison.

Bezoar - Persian پد-زهرا - literally means “antidote”

Debunked by Ambroise Pare
- Bezoar didn’t save his poisoned chef

Modern science has given renewed credence to the antidote notion
- Removal of Arsenic

Classification

Phytobezoar
- Persimmon (diospyrobezoar)
- Psyllium Fruit
- Vegetables

Trichobezoar
- Enteric coated aspirin
- Extended release capsules (nifedipine, theophylline)
- Sucralfate
- Others

Pharmacobezoar
- Enteric coated aspirin
- Extended release capsules (nifedipine, theophylline)
- Sucralfate
- Others

Other
- Styrofoam
- Fungi (candida)
- Lactobezoar
- Cement
- Furniture polish
- Shellac
Phytobezoar

- Composed of vegetable matter
- >50% of all bezoars
- Diospyrobezoar – Persimmon fruit
  - Most common culprit
  - Shiboul chemical forms glue when meets acid
  - Have to eat A LOT

Trichobezoar

- Hair ball
- Young female psychiatric patients
- Rapunzel syndrome

Pharmacobezoar

- Ingested medications
  - Extended release nifedipine
  - Theophylline
  - Enteric coated ASA
  - Sodium Alginate
  - Carafate

---


Diospyrobezoar – Persimmon fruit
- Most common culprit
- Shiboul chemical forms glue when meets acid
- Have to eat A LOT

---


### Pathogenesis

**Continued ingestion of cellulose rich or indigestible materials**

- Rare in healthy subjects
  - Prior surgery
  - Not necessarily gastroparesis

**Persimmon fruit**

- Shibutol → coagulum

**Trichobezoars**

- Hair treated by acid → mixes with food → enmeshed mass

**Pharmacobezoars**

- Tums + anticholinergics + opiates = renal failure
- Carafate + gastric outlet obstruction
- Enteric coating (asa + nifedipine)

### Symptoms

**Phytobezoars – middle aged men**

**Trichobezoars – young females**

- Mostly asymptomatic with insidious symptoms
  - Pain, nausea, emesis, wt loss, anorexia, early satiation
  - Halitosis, alopecia

**GI bleeding due to PUD**

**Rare complications**

**Overdose**
Diagnosis

- Incidental discovery
- Filling defect on imaging
- Trichobezoars absorb barium
- Gold standard – EGD

Treatment

- Chemical dissolution
  - Phytobezoars with mild symptoms
  - More effective if endoscopic not feasible
  - No prospective studies, but trials and case reports
  - Various agents
- Endoscopy
  - Trichobezoars and diospyrobezoars
  - Hack away
- Surgery
  - Failed medical therapy
  - Vinyl gloves
- Prevention
  - 94% recurrence

Chemical Treatment

- Cellulase
  - Preferred, more efficacious
- Papain (meat tenderizer)
  - Side effects
- Acetylcysteine
- Coca-Cola
- Metoclopramide
  - In conjunction with endoscopy or enzymes
Summary & Recommendations

3 major types - phytozoa, trichobezoars, and pharmacobezoars

Mostly asymptomatic for years - develop symptoms insidiously

Incidental finding

Phytobezoars – treat with cellulase or Cola
- May be papain, acetylcystein, reglan
- 3L CocaCola over 12 hours

Trichobezoars + Diospyrobezoars – endoscopy + surgery

Surgery – failed medical therapy or obstruction

Introduction

Anatomy and classification

Pathogenesis

Clinical manifestations

Treatment
Eternal pain in the ass

1772 BC. Code of Hammurabi.
Ancient Babylonian law code inscribed on stone.
On display in The Louvre.

Moses, on doing wrong:
“...The Lord will smite thee with the botch of Egypt, and with the emerods, and with the scab, and with the itch, whereof thou canst not be healed” (Deuteronomy 28: vs. 27, King James Version).

Having placed the man over two round stones upon his knees, examine, for you will find the parts near the anus between the buttocks inflated, and blood proceeding from within. If, then, the condyloma below the cover be of a soft nature, bring it away with the finger, but where it is more...When the condyloma is taken off, streaks of blood necessarily flow from the whole of the torn part. It must be speedily washed with a decoction of galls, in dry wine.

Saint Fiacre - Patron saint of hemorrhoids
Hemorrhoids - "Fiacre’s curse"
Severe case of prolapsed hemorrhoids.
Prayed while sitting on a stone - miraculous cure.
Hemorrhoid imprint remains on stone.
Hemorrhoids suffer pilgrimage to France.
King Henry V of England ransacked St. Fiacre’s tomb.
Later died of hemorrhoids on St. Fiacre Day.
Anatomy of Hemorrhoids

Internal hemorrhoids
- From the superior hemorrhoidal cushions
- 3 primary locations:
  - Left lateral
  - Right anterior
  - Right posterior
- Overlying mucosa is rectal
- Innervation is visceral

External hemorrhoids
- From the inferior hemorrhoidal plexus
- Covered with squamous epithelium
- Somatic pain receptors

Symptoms of internal hemorrhoids arise as they enlarge and protrude below the dentate line.

Hemorrhoids = Normal occurring specialized, highly vascularized cushions forming discrete masses of thick submucosa containing blood vessels, smooth muscle, and elastic and connective tissue.

Anatomy

External or internal based upon whether they are below or above the dentate line, (often coexist)
Classification

Internal hemorrhoids are graded according to degree of prolapse:
- Grade I: No prolapse
- Grade II: Prolapse with spontaneous reduction
- Grade III: Prolapse requiring digital reduction
- Grade IV: Prolapsed, cannot be reduced

Pathogenesis

Advancing age
- Deterioration of connective tissue (anchors hemorrhoids to the underlying sphincter) → hemorrhoids begin to bulge, and "slide" into the anal canal → progressive symptoms

Hypertrophy of the internal anal sphincter
- Pushes hemorrhoid pleats against the internal sphincter → more subject to trauma from fecal bolus → symptoms

Swelling of the hemorrhoidal cushions
- Vascular engorgement of tissue → more prone to trauma from fecal bolus
- In support of this hypothesis: hemorrhoids regress following ligation of the hemorrhoidal arteries

Pathogenesis of Hemorrhoids

Several associations:
- Advancing age, diarrhea, pregnancy, pelvic tumors, prolonged sitting, straining, and chronic constipation
- Chronic constipation, however, was not supported in a large epidemiologic study.1

Bleeding

- Painless bleeding usually associated with BM; typically coats the stool at the end of defecation; may also drip into the toilet or stain toilet paper.
- Chronic blood losses from hemorrhages can be substantial enough to induce iron deficiency.
- Painful bleeding during defecation should prompt investigation for other causes such as anorectal fissures.
- Visible or occult bleeding should not be attributed to hemorrhoids until other potential bleeding sites have been excluded by endoscopic testing.
- Flexible sigmoidoscopy or anoscopy in low-risk younger patients or colonoscopy in most other patients.

Pruritus

- Itching, irritation or mild incontinence are common.
- Prolapse of internal hemorrhoids → leakage of rectal contents → local irritation
- Hemorrhoids may be difficult to clean → prolonged contact of fecal material with the perianal skin → local irritation.
- Patients with leakage may clean too aggressively → perianal irritation.

Pain (rare)

- Pain is usually due to results from thrombosis
- Thrombosis occurs in both internal and external hemorrhoids
- Overlying perianal skin is highly innervated
- Easily visible, purple elliptical mass extending from the anal to the perianal skin.
- Thrombosis of external hemorrhoids, usually less severe; unless strangulated → gangrene → surgical emergency
- Internal usually less severe; unless strangulated → gangrene → surgical emergency
- Pain is usually due to results from thrombosis
Treatment

Conservative medical treatment is recommended for both internal and external hemorrhoids.¹

- Fiber
- Sitz baths
- Topical nitroglycerin
- Topical steroids
- Topical calcium channel blocker

Even thrombosed external hemorrhoids:

- If diagnosed early (<72 hours), consider surgical excision under local anesthesia.
- However, excision not required for patients whose symptoms are improving (pain resolves in 7-10 days).

Fiber

Cochrane meta analysis re: Fiber and hemorrhoids

- 7 controlled trials enrolling a total of 378 participants to fiber or a non-fiber control were identified
- Significant and consistent benefit in improving bleeding.¹

Psyllium vs methylcellulose

- Neither had particular advantage over the other in treating hemorrhoidal disease.
- 20-30g per day
- May help prevent recurrence; continued use indefinitely

Fiber

<table>
<thead>
<tr>
<th>Psyllium</th>
<th>Methylcellulose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk 4 (OTC); Fibersafe® [OTC]; Fibro-Lax [OTC]; Fibro-K [OTC]; GerifibRx® [OTC]; Hydrocortisone [OTC]; Kosyl® [OTC]; Kosyl® Easy Mix® [OTC]; Kosyl® Orange [OTC]; Kosyl® Original [OTC]; Kosyl® Psyllium [OTC]; Metamucil® Plus Calcium (OTC); Metamucil® Smooth Texture (OTC); Metamucil® [OTC]; Natural Fiber Therapy Smooth Texture (OTC); Reguloid [OTC]</td>
<td>Cusmal (OTC)</td>
</tr>
</tbody>
</table>


### Other Medical Treatment

**Sitz Baths**
- Helps relieve irritation and pruritus.
- Warm water 2-3 times per day.

**Topical Nitroglycerin**
- FDA approved rectal (0.4%) ointment for anal fissures.
- Small series supports its use for analgesia in hemorrhoids.

**Topical Nifedipine**
- Small controlled trial suggested benefit.
- Topical nifedipine (50 pts) 0.3% + 1.5% lidocaine bid x 14 days vs. control (48 pts) 1.5% lidocaine bid x 14 days.
- Complete relief of pain in 43 patients (90%) of the nifedipine-treated group vs 24 patients (50%) of the control (P<0.01)

---

### Other Medical Treatment

**Topical Steroids**
- Helps relieve irritation and pruritus.
- Cream applied bid for max of 7 days due to risk of potential thinning of perianal and anal mucosa and risk of injury.

---

### Minimally Invasive

**Reserved for selected patients:**
- Continued symptoms despite medical treatment.
- Grade I III internal hemorrhoids
- NOT external hemorrhoids
- Most (excluding acute thrombosis) are managed medically
- NOT grade IV and symptomatic grade III
- Require surgical treatment

**Ambulatory procedures with minimal morbidity.**

**Fundamentally similar mechanism:**
- Remove or cause sloughing of excess hemorrhoidal tissue.
- Subsequent healing and scarring fixes residual tissue to underlying anorectal muscular ring.
Minimally Invasive

Rubber band ligation
Coagulation (infrared and laser)
Sclerotherapy
Cryosurgery

Choice among procedures often depends on availability and local expertise.

MacRae et al. 1997.1 18 trials.
• Rubber-band ligation is recommended as the initial mode of therapy for grades 1 to 3 hemorrhoids unresponsive to conservative measures. Hemorrhoidectomy showed better response, however it was associated with more complications and pain than rubber-band ligation.

Johanson et al. 1992.2 5 trials, 863 patients.
• Rubber-band ligation superior to other non-surgical options (infrared coagulation, sclerotherapy), but may have higher side effects

Rubber Band Ligation

RBL is the most widely used minimally invasive procedure for hemorrhoids refractory to conservative treatment.

Available since the 1960s.

Several different techniques:
• Forceps applicator
• Suction ligator
• Endoscopic
• Arthroscopic
• Blind

Rubber Band Ligation

Iyer et al. 2004. 804 patients underwent 2114 ligations.\(^1\)

- Success rate of 71% (no symptoms for median 1200 days).
- Low complication rate, bleeding (2.8 %), thrombosed external hemorrhoids (5.5%), and bacteremia (0.09%).

Wechter et al. 1987.\(^2\)

- Pain is most common complication; occurring in ~ 8% of cases.


Rubber Band Ligation

Attempt to stay \(>5\)mm proximal to dentate line.

Usually only one column of hemorrhoids is treated in a single session, but up to three bands on a single column may be safely applied.\(^1\)

Treatments are repeated at 4-6 week intervals until all symptoms are controlled and all hemorrhoids are gone.


Rubber Band Ligation

Contraindications to rubber band ligation

<table>
<thead>
<tr>
<th>TABLE 4. Contraindications to anoscopic or endoscopic therapy of internal hemorrhoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute hemorrhoidal thrombosis</td>
</tr>
<tr>
<td>Thrombosis (e.g., prostatectomy, anticoagulation)</td>
</tr>
<tr>
<td>Chronic anticoagulation therapy</td>
</tr>
<tr>
<td>Active rectal inflammatory bowel disease</td>
</tr>
<tr>
<td>Severe anemia or coagulopathy</td>
</tr>
<tr>
<td>Rectal abscess or fistula</td>
</tr>
<tr>
<td>Rectal malignancy</td>
</tr>
</tbody>
</table>

Rubber Band Ligation

**Forceps applicator**
- Internal hemorrhoid is grasped with forceps through anoscope and pulled into drum of ligator.
- Rubber bands then advanced down to the neck of the hemorrhoid.

**Rubber Band Ligation**

**Suction ligator:**
- Endoscopic: internal hemorrhoid is suctioned into the ligating drum which is attached to an endoscope.\(^1\)
- Anoscopic (non-endoscopic devices) Anoscope + wall suction + ligator.
- Marketed as KillRoid (AstraTech), ShotShot (Cook Medical).
- Blind: single use disposable ligator
  - Marketed as CRH O’Regan System


**Rubber Band Ligation**

**Blind suction ligator:**
- CRH O’Regan System
Other Minimally Invasive Treatment

<table>
<thead>
<tr>
<th>Coagulation - bipolar or infrared</th>
<th>Sclerotherapy</th>
<th>Cryosurgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Application of modality (current, infrared, laser) to cause coagulation and necrosis → fibrosis in submucosal layer.</td>
<td>• Specialized needles inject sclerosing agents directly into hemorrhoidal tissue → intense inflammatory reaction destroys redundant submucosal tissue associated with hemorrhoids.</td>
<td>• Application of liquid nitrogen probes to hemorrhoid → necrosis and fixation of hemorrhoidal cushion. Supplanted by other methods. Not recommended.</td>
</tr>
</tbody>
</table>


Lasers - done with ND:YAG or CO₂ laser.

- No advantage over others and expensive with serious complications.

Doppler guided hemorrhoidal artery ligation.

- Specialized proctoscope (Moricorn) uses Doppler transducer to identify and ligate hemorrhoidal arteries.
- Improvement in pain, prolapse, and bleeding in 78-96% of pts (116).


Surgical Treatment

Only recommended for a small minority of patients:

- Failure of medical and non-operative therapy
- Symptomatic grade III or grade IV hemorrhoids
- Strangulated internal hemorrhoids

Various techniques:

- Closed hemorrhoidectomy
- Open hemorrhoidectomy with excision and ligation
- Stapled hemorrhoidectomy
- Lateral internal sphincterotomy

Usually require general or spinal anesthesia.
Surgical Treatment

Closed hemorrhoidectomy

- Most common surgical procedure done for internal hemorrhoids.
- Elliptical incision is made to remove hemorrhoidal tissue. Crosses the dentate line. Closed with sutures. 95% success rate.

Open hemorrhoidectomy

- Some surgeon advocate no mucosal closure to reduce infection risk.
- A modified version (semi-open) was associated with more rapid healing and lower postoperative complications (300 pts).1

Stapled hemorrhoidectomy (hemorrhoidopexy)

- Intraluminal stapling device excises a circumferential column of mucosa and submucosa from upper anal canal → reduces hemorrhoids and fixes their position.

Surgical Treatment

Lateral internal sphincterotomy

- Used for patients with internal hemorrhoids and high resting internal anal sphincter pressures.
- Used frequently for patients with concomitant fissure disease.1


Surgical Treatment

Pain following hemorrhoidectomy is nearly universal.
- Long acting bupivacaine injected during procedure.
- Some benefit with:
  - Diltaizem (2%) ointment tid x 7 days
  - Botox

Other complications:
- Urinary retention (30%)
- UTI (5%)
- Delayed hemorrhage (1-2%)
- Fecal impaction (usually related to opioid use due to pain)

Summary and Recommendations

Remember the hemorrhoid grading (grade I-IV)

Dietary modification for all patients
- adequate fluid and fiber intake (~30g fiber/day)

Medical therapy: sitz (if itching) +/- medications (ccb, nitro, steroids)

Minimally invasive procedures
- Reserved for grade I-II after failed medical therapy
- Rubber band ligation preferred over others

Surgical hemorrhoidectomy
- Reserved for small minority of patients
  - grade IV and same grade III
  - failed minimally invasive approaches
  - mixed internal and external
  - strangulated internal
  - acute thrombosed external

Summary of complications: