HEMORRHOIDS, FISSURES & FISTULAS

HEMORRHOIDS

- Greek term "haema" (blood) and "rhoos" (flowing) coined by Hippocrates
- found in the subepithelial space as connective tissue cushions surrounding the direct A-V communications between the terminal branches of the superior rectal arteries and the superior, inferior, and middle rectal veins
  - 3 cushions (right anterior, right posterior, left lateral)
  - act as plug to anal canal and contribute 15-20% to resting pressure
- Etiology/ Pathophysiology
  - abnormal swelling of the cushions, stretching of suspensory muscles, dilation of submucosal av plexus results in prolapse of upper anal/ lower rectal tissue
  - causes: fecal arrest, corpus cavernosum of the anus, ampullary pump failure, anal cushion disruption, fragmentation of suspensory connective tissue, pregnancy and anal pressure increase
- Symptoms/ classification
  - symptoms: bleeding (most common), discomfort, pruritis, prolapse, swelling, pain, discharge
  - evaluation: presence, size, timing, reducibility of prolapsing tissue
    - effect on hygiene may drive operative intervention
    - anal pain is rarely associated unless external hemorrhoid thrombosis or concomitant anal fissure
    - thrombosed internal hemorrhoids cause discomfort, pressure, bleeding, mucus production, inability to reduce spontaneously prolapsing tissue
  - Classification: 1985 Banov
    - 1st degree: internal hemorrhoids that bleed but do not prolapse
    - 2nd degree: spontaneously prolapsing and reducing hemorrhoids (with or without bleeding)
    - 3rd degree: prolapsing hemorrhoids that require reduction
    - 4th degree: prolapsed internal hemorrhoids that cannot be reduced
  - External hemorrhoids
    - symptomatic when thrombosed or skin tags are so large, hygiene difficult
    - thrombosis: ulceration, bleeding, necrosis, infection, pain
    - size of thrombosis determines symptoms which determines need for operative therapy
  - Internal hemorrhoids
    - enlarge, prolapse, incarcerate, strangulate, bleed
- Treatment
  - Medical therapy
    - Fiber to avoid constipation
    - Reduce, correct, or eliminate cause of diarrhea
    - Nitroglycerin ointment – relieve pain after thrombosis of ext. hemorrhoid
  - Local nonoperative therapy
    - Sclerotherapy: first described by Morgan in Dublin 1869
      - first and second degree hemorrhoids, only two sites at a time

        - submucosal injection of 5cc of 5% phenol in oil or hypertonic (23.4%) salt solution at base of hemorrhoidal complex causes thrombosis of vessels, sclerosis of connective tissue, shrinkage/fixation of overlying mucosa
        - complications: pain in 70%, impotence, urinary retention, abscess
        - successful control of symptoms 59-84%
    - Rubber Band Ligation
        - tight encirclement of redundant mucosa, connective tissue, and blood vessels in hemorrhoidal complex at least 2cm proximal to anal transition zone
        - causes necrosis and ulceration at the base of the ligation
        - used for internal hemorrhoids of all degrees
        - complications: severe pain, abscess, urinary retention, massive bleeding around POD#10 (0.5-8% complication rate)
        - minor complications: band slippage, prolapse/thrombosis adjacent hemorrhoids, minor bleeding (<5%)
        - do not use in immunocompromised: untreated AIDS, leukemia, severe diabetes, those on chemotherapy
        - success rate: 50-100%
    - Dipolar Diathermy, Direct Current Electrotherapy, Infrared Photocoagulation
        - coagulation, occlusion, and obliteration/ sclerosis of the hemorrhoidal vascular pedicle above the level of anal transition zone
        - area of tissue damage sloughs→ ulcer → fibrotic tissue at site
        - complications: pain, bleeding, fissure, spasm of internal sphincter, ulcer formation
        - success rate: diathermy (88-100%), electrotherapy (88%), photocoagulation (67-96%)
- Surgical Hemmorhoidectomy
    - Indications:
        - banding or another nonoperative method fails to manage symptoms
        - problem cannot be managed non-op.
        - an anal fissure, fistula or papilla is present
        - patient requests it specifically
        - In those with 3rd and 4th degree hemorrhoids and significant external components (5-10%)
    - Milligan-Morgan method: excises internal and external component of hemorrhoid and only closes the internal defect of the mucosa leaving remaining open skin to close secondarily
    - Ferguson method: closed incision of all of the areas of resection
    - Circular stapled hemorrhoidectomy (PPH): purse-string redundant hemorrhoidal tissue and use 33-mm circular stapler
    - Complications:
        - urinary retention
        - bleeding

        - stenosis
        - incontinence
        - infection (E. Coli, Staph Aureus, S. epidermidis)
    - AIDS is a condtraindication, HIV+/ Crohn's Disease are not

ANAL FISSURE

- common cause of rectal bleeding in children and infants
- pain with defecation and bright red rectal bleeding coating stool or on toilet paper
- Risk factors:
  - Childbirth
  - alteration of bowel habits (constipation and diarrhea)
  - previous anorectal disease or surgery
- **90% in POSTERIOR MIDLINE
- anterior anal fissures seen more commonly in women
- Etiology:
  - tear →exacerbated by spasm of anorectal musculature → increased pain and fear with further defecation → anal hypertonia →relative ischemia to anorectal region →prevention of healing and propagation of fissure
- Primary v. Secondary
  - Primary: direct result of trauma to anal canal
  - Secondary: related to other disease states (Crohn's dz, TB, syphilis, AIDS)
    - seen in lateral aspects of anal canal
    - treat primary disease to heal fistula
    - look for anal canal cancer (presents with perianal pain and ulceration)
- Acute v. Chronic
  - Acute: tear of the anoderm, bleed easily upon inspection
  - Chronic: present for >30d, typically associated with sentinel skin tag or hypertrophied anal papilla secondary to scarring from fissure itself
- Take detailed bowel history, may have to defer DRE due to pain
- Treatment
  - *majority of acute fissures will resolve on their own
  - 30% will progress to chronic fissure (only 20-30% of these will heal with standard. medical therapy)
  - Medical treatment
    - Bulk laxatives, high-fiber diet, sitz baths
    - Topical anesthetics to control pain
    - Topical Nitrates: healing rates 46-68%
      - significantly reduced pain associated with chronic fissures
      - side effect of headache
    - Botulinum toxin (type A)
      - injected via insulin syringe into both lateral sides of sphincter
      - pain relief in 2 days, cure rates 80% at 2-3 months
      - side effect: transitory anal incontinence in ~5%, local hematomas, perianal thrombosis
    - Topical calcium channel blocker (nifedipine, diltiazem)

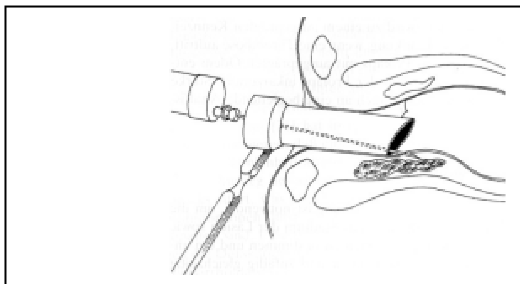
            - lower anal canal resting pressures, relieve pain, promote healing of anal fissures
    - Surgical treatment: aimed at reducing resting pressures of anal canal
        - if fissure persists more than 4 weeks after conservative measures, then try botox, topical nitro/nifedipine, surgery
        - Open lateral internal sphincterotomy
            - cut small portion of internal anal sphincter
            - healing rate >98%
            - complications (rare): bleeding, urinary retention, pain, abscess
        - Anal dilatation
            - may lead to irreversible fecal incontinence → abandoned
        - Closed lateral internal sphincterotomy
            - lower recurrence rate and lower incidences of incontinence and fecal soiling
        - Advancement flaps
            - those with impaired sphincter control, recurrence after sphincterotomy or known sphincter defect

FISTULA IN ANO

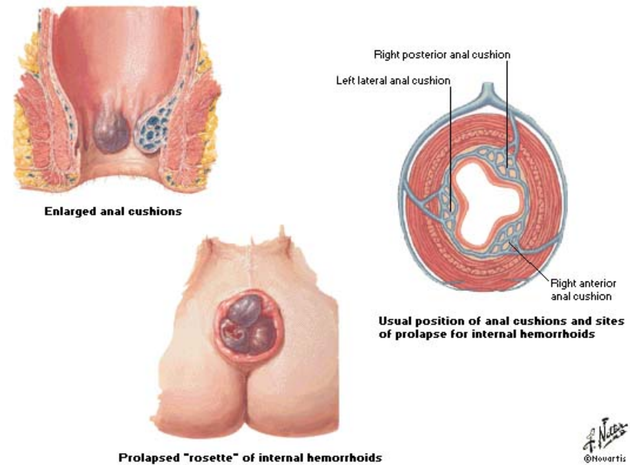
- connection between anus, rectum, or more proximal bowel and the perianal skin
- most travel from an anal gland crypt at the dentate line out to the perianal skin
- usually single opening but may have multiple (ie: Crohn's disease)
- **GOODSALL'S RULE*
    - an external opening posterior to an imaginary coronal plane bisecting the anus would have an internal opening at the posterior midline
    - an external opening anterior to this plane would have an internal opening radially directed straight to the nearest anal gland
    - women > men and posterior > anterior in terms of accuracy
- Presentation
    - recurring perianal abscess or persistent drainage from the external opening on the skin
    - unless acute abscess present, usually not painful
    - Causes: persistent cryptoglandular sepsis, anal fissure, trauma, malignancy, radiation injury, anal intercourse, foreign body, IBD, AIDS, actinomycoses, TB, hydradenitis suppuritiva, pilonidal disease, diverticulitis, lymphogranuloma venereum, osteomyelitis, urethroperineal fistula
- Diagnosis
    - history and physical exam
    - if fistula is persistent, recurrent or has a high internal opening may need other studies such as transanal ultrasound, anoscopy, proctoscopy, flex sig, instilling methylene blue or hydrogen peroxide to define tract, fistulogram
- Treatment
    - several treatments: recurrence and incontinence are inversely related
    - DRE and anoscopy
    - Define tract with probe or instill methylene blue or hydrogen peroxide
    - Multiple options

- Primary fistulotomy: entire tract opened along its length
  - low intersphincteric fistulae which are short and posterior and no involvement of external sphincter
  - avoided anteriorly, esp. in women
  - may use cutting seton, staged fistulotomy for long transsphincteric fistulae
- Anorectal mucosal or dermal island advancement flaps
  - anterior fistulae, especially in women
- Crohn's patients present w/ multiple fistulae arising from inflamed rectal mucosa proximal to dentate line
  - *sphincterotomy should be avoided and medical treatment pursued (topical steroid, mesalamine, remicade) with surgical abscess drainage, biopsy, and Seton drainage

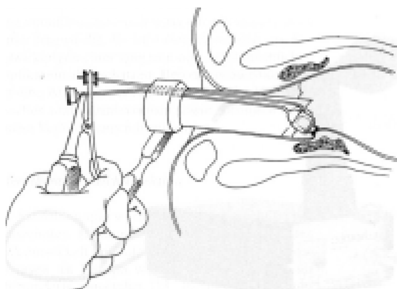
o Fibrin Sealant



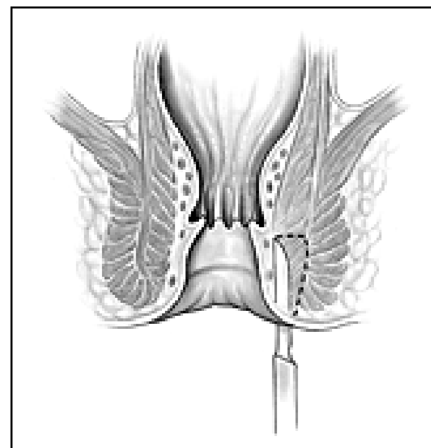
SCLEROTHERAPY



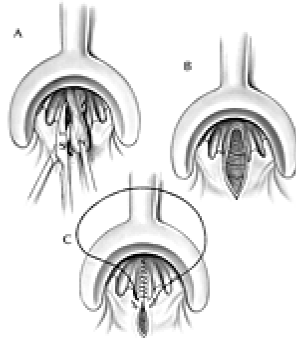
HEMORRHOIDS



BANDING



LATERAL SPHINCTEROTOMY



CLOSED HEMORRHOIDECTOMY

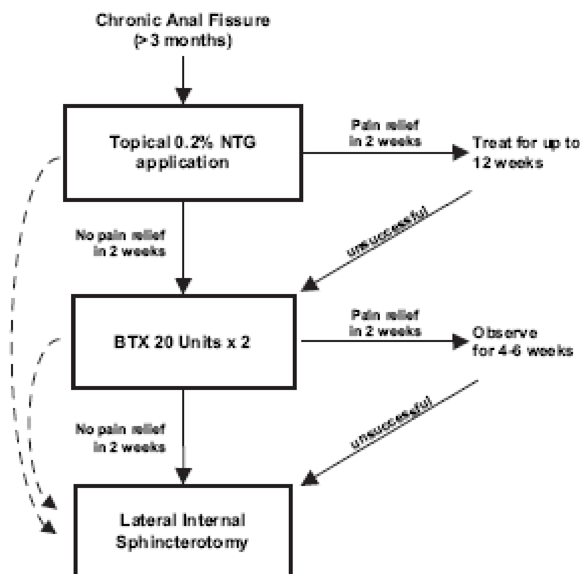


Fig. 1. Treatment algorithm (see text). NTG = nitroglycerin; BTX = botulinum toxin.

Table 1. Distribution of Treatment Modalities and Cost Analysis

Treatment	No. of Patients	100 Units Botox	40 Units Botox
NTG alone	29	$290	$290
NTG + Botox	30	$20,580	$11,076
NTG + surgery	3	$3,357	$3,357
NTG + Botox + surgery	5	$9,025	$7,440
Total	67	$33,282	$22,194

NTG = nitroglycerin; Botox = botulinum toxin type A.

BOTOX VS. NTG VS. SURGERY: From Essani et al. "Cost-Saving Effect of Treatment Algorithm for Chronic Anal Fissure: A Prospective Analysis." Journal of Gastrointestinal Surgery. 2005.

- 67 patients with chronic anal fissure (>3 months)
- treatment algorithm as listed above with follow-up every four weeks, mean f/u 6 months
- NTG alone healed 31/67 (46.2%)
    - 2 later developed recurrence and treated with botox
- of 36 who failed NTG: 3 requested surgery, 33 injected with botox
    - Botox successful in 28/33 (84.8%), 5/33 failed requiring LIS (15.2%)
- overall surgery rate for whole group 11.9%, no one complained of incontinence
- cost analysis comparing algorithm with "Brisinda approach" (no NTG, botox and surgery only) and "Nelson approach" (surgery only)

- conclusion: the algorithm can avoid surgery in 88% of patients and thus saves direct costs of up to 70%. Surgery and botox should not be initial treatment, only used when cheaper methods fail.

BOTOX: Arroyo et al. The American Journal of Surgery. 2005.

- 80 patients randomized to LIS or botox (25 units: 8u dose into either lateral side of sphincter and 9u into anterior verge)
- CAF defined as presence of fibrous induration or exposed internal sphincter fibers, treated conservatively for 6 weeks
- 2 month, 6 month, 1, 2, 3 year follow-up, anorectal manometry performed
- at 6 months persistence or recurrence in:
  - 2 in sphincterotomy group (5%)
  - 12 in botox group (30%) $p < 0.05$
- healing at one year:
  - 37 patients in sphincterotomy group (92.5%)
  - 18 patients in botox group (45%)
  - $p < 0.001$
- less likely to heal if fissure present >12 months or presence of sentinel pile
- mean resting pressures decreased significantly ($P < 0.001$) in both groups compared to previous pressures, more so in the sphincterotomy group
- incontinence at 2 months:
  - 3 (7.5%) in sphincterotomy group
  - 2 (5%) in botox group
- at 6 months, incontinence spontaneously resolved in 2/2 botox group and 1/3 in LIS group
- only age > 50 associated with incontinence
- conclusion:
  - surgical treatment should be considered in the groups with disease >12 months, presence of sentinel pile and certain manometric factors
  - use of botox as first approach in those over 50 or have risk factors for incontinence (i.e. multiple vaginal deliveries, prior anal surgery, prior incontinence,)

FIBRIN GLUE: Zmora et al. Diseases of Colon and Rectum Dec. 2005.

- prospective, multicenter evaluation
  - 60 patients with high perianal fistulas
- 32 patients completely healed (53%) and 28 with recurrent fistula
- of 28 patients with recurrent fistula, 8 underwent second injection of fibrin glue
  - 2 healed, 5 exited study, 1 without success
- adverse effect seen in 47%: mild and self-limiting
- recurrences occurred early: 75% 1st month, 89% 2nd month
- conclusion: fibrin glue injection for perianal fistulas, safe, simple, associated with early return to normal activity

ANAL FISTULA PLUG: Johnson et al. Diseases of Colon and Rectum. March 2006.

- prospective cohort study
- 25 patients with high anorectal fissures
- 10 treated with fibrin glue
  - 6 with persistence of fistula at 3 months (60%)
- 15 treated with fistula plug
  - 2 with persistence of fistula at 3 months (13%), $p < 0.05$
  - median time to failure 4 weeks
- conclusion: closure of primary opening of fistula tract using a biologic anal fistula plug is effective

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February 27, 2006