Fistulae and Fissures – Diagnosis and Treatment

Johann Pfeifer

Department of General Surgery, Medical University of Graz, Austria
General Surgeon
Colorectal Surgery EBSQ

Department of General Surgery, Medical University of Graz, Austria
Medical University of Graz

Proctology
Outpatients Department
2007
Patients: 1177

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Anal Fistula
Anal abscess is the acute, anal fistula the chronic form of the same disease!!!
Incidence of anorectal fistulas

- 5% of all anorectal diseases
- male:female = 2 - 4 : 1
- pts. between 20 - 60 yrs
- 10,4 – 23,2 / 100 000
- more frequent in black people
- no seasonal preponderance

Anal fistula - Etiology

- 90% cryptoglandular infection
- 3% trauma, postoperative
- 3% following anal fissure
- 3% IBD
- <1% Tbc, malignancy, actinomycosis, hematological disease, st.p. RTX etc.

- infection starts in intersphincteric space
- individual disposition
Anal fistula - Etiology

Cryptoglandular origin Mb. Crohn
Anorectal Sepsis - Microbiology

Bowel-derived organisms → fistula
(E.coli, bacteroides)

Skin-derived organisms → no fistula
(Staph. aureus, Staph. epidermidis)

Meislin 1977 Ann Int Med
Eykyn 1986 Ann R Coll Engl
Nicholls 1990 J R Soc Med
Phillips 1994 Br J Surg
Anorectal fistula – Definition and Frequency

- subcutaneous: 16% - 31%
- intersphincteric: 21% - 56%
- transsphincteric: 21% - 52%
- suprasphincteric: 1% - 12%
- extrasphincteric: 0% - 7%
Anorectal fistula - Definition

Low - High

Simple - Complex

≈ 85%

≈ 15%
Anorectal fistula - Clinical assessment

Inspection: external opening
Godsall’s rule

Rectal-digital palpation: induration
relation to puborectalis (posterior)
relation to top of sphincter (anterior)
compare sides

Experts > 80 %
Godsall’s rule

Anterior

(Lithotomy position)
Anorectal fistula - Investigations

• Fistulography
• Anal sonography
• Anal manometry
• MRI
Diagnosis

digital-rectal exam
CAVE: Pain !!

Exam Under Anesthesia
(EUA)

EUS

sensitivity 73% to 88%
specificity 46% to 100%

MRI

sensitivity 81% to 100%
specificity 67% to 100%

intraop. agreement 35% bis 100%

Schäfer AO Fortschr. Röntgenstr. 2006

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Anorectal fistula

Fistula in ano surgery is nothing for beginners !!!

The operation must be tailored to the patient !!!
Probably more reputations have been damaged by the unsuccessful treatment of cases of fistula than by excision of the rectum or gastroenterostomy!

J.P. Lockart-Mummery, 1929
Surgical Principles

- Define anatomy of fistula track
- Drain any associated sepsis
- Remove associated epithelialized tracks
- Prevent recurrence
- Preserve continence and sphincter integrity
How much sphincter can be divided without disturbing continence?

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Results of Anal Fistula Surgery

- **recurrence:** 0% - 32%
- **postop.function (incontinence):** 0% - 63%

Westerterp et al. *Colorectal Dis* 2003
Sykut et al. *Colorectal Dis* 2006

- **quality of life:** few data available, discrepancy between results and patient’s satisfaction

recurrence: 8%
incontinence: 46%  
12% unsatisfied

Phillips R *Br J Surg* 1994

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Patient’s Satisfaction

• patients with fistula recurrence report higher dissatisfaction rate than with anal incontinence (61% vs 24%)

• postop. incontinence more often then fistula recurrence (84% vs 33%)

García-Aguilar J, Davey CS, Le CT, Lowry AC, Rothenberger DA
Patient satisfaction after surgical treatment for fistula-in-ano
Anorectal fistula - Surgical Techniques

• Lay-Open technique: Fistulotomy or Fistulectomy

• Traditional Sphincter Saving Procedures:
  - Core-out
  - Endorectal Advancement Flap
  - Seton: chemical, tight, loose

• Novel Sphincter Saving Procedures:
  - Fibrin glue
  - Anal plug
Lay – Open Technique for Anorectal fistula

- effective
- safe
- masuprialization

- healing time longer
- sphincter defects more likely
Traditional Sphincter Saving Procedures: Anorectal fistula – Core-out

• removal of entire track
• combination with other techniques
• secondary tracks

• no advantage for core-out in:
  - superficial fistulas
  - very low fistulas
  - concomitant abscess
Traditional Sphincter Saving Procedures: Anorectal fistula – Rectal Advancement flap

- elegant
- repeatable
- milk-methylenblue
- flap raising
- no tension
### Anal fistula – Rectal Advancement Flap

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>N</th>
<th>Success</th>
<th>Incontinence</th>
<th>Follow-up (months)</th>
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<tbody>
<tr>
<td>Garcia-Aguilar et al</td>
<td>1984</td>
<td>151</td>
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<td>Kodner et al</td>
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<td>Kreis et al</td>
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<td>Schouten et al</td>
<td>1999</td>
<td>44</td>
<td>75</td>
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<td>Ortiz and Marzo</td>
<td>2000</td>
<td>103</td>
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<td>Mizrahi et al</td>
<td>2001</td>
<td>94</td>
<td>59.6</td>
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<td>40.3</td>
</tr>
</tbody>
</table>

Mizrahi et al. Dis Colon Rectum 2002

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Anal fistula – Rectal Advancement Flap + Gentamicin-collagen

n=83 (PRCT)

12 months

recurrence with gentamicin-collagen 26/42

recurrence without gentamicin-collagen 21/41

No difference

Gustafsson UM BJS 2006
Anal fistula:

Direct closure of the internal opening (without flap)

$n = 44$

28 healed (follow-up 5 months)

18/44 (41%) recurrence (follow-up 36 months)

flap technique better than direct closure

Thomson WH Colorectal Dis 2004

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Traditional Sphincter Saving Procedures: Anorectal fistula - Seton

- chemical, loose, tight
- for high anal fistulas
- rarely used
- complex fistulas (Mb. Crohn)
- long term drainage
- IBD or immunosuppressed patients
Novel Sphincter Saving Procedures: Anorectal fistula - Fibrin glue

- can be repeated
- expensive
- worse results, if
  - short tracks
  - internal opening high up
  - complex fistulas
# Anal fistula - Fibrin Glue

<table>
<thead>
<tr>
<th>Fistula Type</th>
<th>Primary Glue</th>
<th>Re - Glue</th>
<th>Cumulative Glue</th>
<th>Conventional Treatment</th>
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<tbody>
<tr>
<td>Simple</td>
<td>2/6 (33%)</td>
<td>1/2 (50%)</td>
<td>3/6 (50%)</td>
<td>7/7 (100%)</td>
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<tr>
<td>Complex</td>
<td>6/13 (46%)</td>
<td>3/3 (100%)</td>
<td>9/13 (69%)</td>
<td>2/16 (13%)</td>
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<tr>
<td>All fistulas</td>
<td>8/19 (42%)</td>
<td>4/5 (80%)</td>
<td>12/19 (63%)</td>
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<tr>
<td>Cryptoglandular</td>
<td>7/17 (41%)</td>
<td>3/4 (75%)</td>
<td>10/17 (59%)</td>
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<tr>
<td>Crohn’s</td>
<td>1/2 (50%)</td>
<td>1/1 (100%)</td>
<td>2/2 (100%)</td>
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## Anal fistula - Fibrin Glue

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Success (pts)</th>
<th>Success (%)</th>
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</thead>
<tbody>
<tr>
<td>Abel</td>
<td>1993</td>
<td>17/20</td>
<td>85</td>
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<tr>
<td>Venkatesh</td>
<td>1999</td>
<td>12/21</td>
<td>57</td>
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<tr>
<td>Cintron</td>
<td>1999</td>
<td>50/85</td>
<td>59</td>
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</table>

**Overall healing Rate 53 %**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Success (pts)</th>
<th>Success (%)</th>
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</thead>
<tbody>
<tr>
<td>Mortensen</td>
<td>2002</td>
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<td>Sentovich</td>
<td>2003</td>
<td>33/48</td>
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<tr>
<td>Buchanan</td>
<td>2003</td>
<td>3/22</td>
<td>14 (long)</td>
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<tr>
<td>Loungnarath</td>
<td>2004</td>
<td>12/39</td>
<td>31 (long)</td>
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<tr>
<td>Zmora</td>
<td>2005</td>
<td>12/39</td>
<td>38 (long)</td>
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</tbody>
</table>
Novel Sphincter Saving Procedures: Anorectal fistula - Anal Plug

- 25 pts: fibrin glue 10 pts
  anal plug 15 pts
- Follow-up: 3 months

- Results:
  healing fibrin glue 4/10 (40 %)
  plug 13/15 (87%)

Collagen Fistula Plug for the Treatment of Anal Fistulas


**RESULTS:**
- 44 patients (27m, 17f); age 44.1 yrs
- simple fistulas 24; complex fistulas 20

**HEALING RATE:**
- 84 % (3 to 8 weeks)
- 72.7 % (8 weeks)
- 62.4 % (12 weeks);
- 54.6 % (6.5 months)

**Long-term closure:**
- simple vs complex 70.8 % vs. 35 %
- non-Crohn’s vs. Crohn’s disease 66.7% vs. 26.6%
Crohn’s Fistula

- **Simple fistula:** no symptoms → nothing
- **Simple fistula:** symptoms → lay-open + antibiotics
- **Complicated fistula:**

    Gut 2006; 55 (Supplement 1):i36-i58; doi:10.1136/gut.2005.081950c
    © 2006 by BMJ Publishing Group Ltd & British Society of Gastroenterology

**European evidence based consensus on the diagnosis and management of Crohn’s disease: special situations**

Complicated Fistulas

1. Surgery: Seton
2. AB, AZA, 6-MCP, Infliximab

- Remission

- AZA, 6-MCP
  - Remission
  - AZA, 6-MCP + Infliximab 10mg/kg

- Local therapy advancement flap
  - Remission
  - No success

- Other options:
  - Cyclosporin, Tacrolimus
  - Ileostomy colostomy proctectomy
Anal Fissure
Anal fissure

- ulcer in the distal anal canal
- no sex or age preponderance
- 90% posterior, 10% anterior

(in lithotomy position)
Anal fissure - Etiology:

- Trauma (just 25%)
- Diarrhea (5% - 7%)
- Miles: “pecten band”
- Eisenhammer: hypertonic IAS
- Klosterhalfen: angiogram
- Schouten: Doppler
Acute anal fissure

- sharp edges
- very painful
- minor bleeding
- healing within 2-3 months
Chronic anal fissure

- pain and bleeding less
- investigation possible
- > 3 months or secondary changes

a) indurated edges
b) hypertrophied papilla
c) sentinel tag
Diagnosis

- Anterior: 10%
- Posterior: 90%

Conditions:
- Crohn's disease
- Ulcerative colitis
- Syphilis
- Tuberculosis
- Leukemia
- Cancer
- HIV

- Acute and chronic anal fissure
Anal manometry findings in anal fissure patients

- high pressure
- slow waves
- paradoxical RAIR
Treatment rationale for anal fissures

reduced anal pressure

less anal pain

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Anal Fissure - Treatment Options

1. **Conservative:**
   * diet, stool softeners, sitz baths
   * nitric oxide donors:
     - Glyceril trinitrate (GTN)
     - Isosorbide dinitrate (ISDN)
   * calcium channel blocker:
     - nifedipine
     - diltiazem
   * Botulinum toxin A
   * cholinergic agonists
     - betenachol
   * alpha-1 adrenergic antagonists
     - indoramin
   * hyperbaric O₂

2. **Operative:**
   * anal dilatation
   * posterior internal sphincterotomy (PIS)
   * lateral internal sphincterotomy (LIS)
   * fissurectomy
   * advancement flap
Possibilities influencing the smooth muscle cell in the IAS:

- Sympathetic nerve stimulation via $\alpha$-adrenoceptors → contraction
- Sympathetic nerve stimulation via $\beta$-adrenoceptors → relaxation
- Electrical field stimulation via NANC via NO → relaxation
- NANC nerves can be influenced by presynaptic cholinergic input via muscarinic receptors → relaxation
- Direct stimulation of various substances → relaxation

or

→ contraction
Physiology of the smooth muscle cell of the IAS

Smooth muscle cell

1. Nic
2. NANC
3. CHOL

+ β
- α

ADR
Nic
Prostaglandin E2
VIP
ATP etc.
Prostaglandin F2α
Dopamin etc.

+ Prostaglandin F2α

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Glyceryl trinitrate (GTN) ointment acts as a NO-donor promoting:

- healing of the fissure
- increasing blood flow
- decreasing MRP
- vasodilatation of the muscle vessels
### Results and complications of GTN treatment

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>n</th>
<th>Concentration of GTN (%)</th>
<th>Anal pressure reduction (%)</th>
<th>Healing rate at 6 weeks (%)</th>
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<tr>
<td>Loder</td>
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<td>Oettle</td>
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<td>RCS</td>
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<td>84</td>
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</table>

**Success ≈ 27% - 68%**

**Main problem: Headache**
Physiology of intra-and extracellular calcium in the smooth muscle cell of the IAS

TA Cook, AF Brading, NJM Mortensen
BJS 1999
Calcium channel blocker for the treatment of anal fissures:
- prospective, randomised, double blind study
- 144 patients 0.2% nifedipine 2x for 3 weeks
- 142 controls 1% lidocaine, 1% hydrocortisone

Healing 95% vs. 50% (p < 0.01)

Oral nifedipine reduces resting anal pressures and heals chronic anal fissures. Cook TA et.al. BJS 1999; 86: 1269-1273

0.2% nifedipine / diltiazem 2% cream probably better than GTN

less side effects

- headache 4 pts, no incontinence episodes

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### Results and complications of botulinum toxin treatment

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>n</th>
<th>Dose</th>
<th>Healing rate</th>
<th>Temporary incontinence (%)</th>
<th>Recurrence (%)</th>
<th>Complications</th>
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<td><strong>BOTOX</strong></td>
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<td><strong>Neurobloc (TypB)</strong></td>
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<td>0 (1 month)</td>
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<td>N.A.</td>
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**Success ≈ 50% - 96%**

**Main problem: Costs**
Topical nitrates potentiate the effect of botulinum toxin in the treatment of patients with refractory anal fissure
Lysy J. et al. Gut 2001; 48 : 221 - 224

• Total 30 pts. after Isosorbiddinitrate treatment (ID)
• Group A : 20 U Botox and 2,5 mg ID 3x/d
• Group B : 20 U Botox
• Follow up 10 months
• A 66% vs. B 20% healed after 6 weeks

Not sphincter insensitivity to nitrates, but primary cholinergic tonus dominance !!!
Anal fissure - Anal stretching

- 1838 Recamier
- Lord’s procedure
- recurrence rate up to 57%
- minor incontinence up to 28%
- external sphincter damage

OBSOLETE!
Lateral Sphincterotomy

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## Results and complications of LATS

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>n</th>
<th>Minor complications (%)</th>
<th>Major complications (%)</th>
<th>Recurrence / Nonhealing</th>
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<tr>
<td>Bailey</td>
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<td>418</td>
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Fissurectomy

Incontinence rate lower, Healing rate at least the same ?!?
Results and complications of anal advancement flap for the treatment of chronic anal fissures

<table>
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Conclusion:

**Anal fistula:** 85% simple, 15% complicated

- MRI, EUS best diagnostic tools
- Fistula can just be healed by surgery (!?)
- Crohn’s fistulas: often complicated - team approach necessary (gastroenterologist + surgeon)

**Anal fissure:** Botulinum best, but expensive; Calcium Channel blocker better than GTN

- Surgery: Fissurectomy, LATS, Advancement flap rare necessary
THANK YOU

Department of General Surgery, Medical University of Graz, Austria