SIMPLE FISTULA-IN-ANO

CUT OR FILL OR FLAP

Waleed Omar, MD. PhD.
Professor of Colorectal surgery, Mansoura University, Egypt
National representative of Egypt at the ESCP
Disclosure

- None to be declared.
Types of fistula?

- Simple fistula.
- Complex fistula.
**Simply**

**Simple fistula**
Fistulas that you **can** cut lay open (fistulotomy).

**Complex fistula**
Fistulas that you **cannot** cut lay open (fistulotomy).
Surgical anatomy & types:

**Complex fistula**

1. Transphincteric fistulas that involve >30% of the external sphincter.
2. Suprasphincteric.
3. Extrasphincteric.
4. Horseshoe fistulas.
5. Anal fistulas associated with IBD, radiation, malignancy.
6. Preexisting fecal incontinence, or chronic diarrhea, or weak sphincters.
7. Anterior fistula in females.

**Simple fistula**

have none of these complex features

1. Superficial fistulas.
2. Intersphincteric fistulas.
3. Low transphincteric fistulas that involve <30% of the external sphincter.
Surgical anatomy:

Simple fistulas
Fistula procedures:

- Concept
- Cut
- Fistulotomy
- Fill
- Fibrin glue
- Permacol
- Plugs
- Flap
- Advancement
- LIFT
- Shrink & Denature
- VAAFT
- FiLaC
- Drain
- Seton
- Excise
- Fistulectomy
Fistulotomy is surgery to open and drain an abnormal tract connecting two surface epithelium.
### Fistulotomy (results)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Number</th>
<th>Healing %</th>
<th>Recurrence %</th>
<th>Incontinence %</th>
<th>Follow up Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stelzner</td>
<td>1956</td>
<td>73</td>
<td>100</td>
<td>-</td>
<td>10</td>
<td>60-120</td>
</tr>
<tr>
<td>Akvobianz</td>
<td>1968</td>
<td>40</td>
<td>100</td>
<td>-</td>
<td></td>
<td>24-48</td>
</tr>
<tr>
<td>Riedler</td>
<td>1978</td>
<td>107</td>
<td>74</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Saino</td>
<td>1985</td>
<td>199</td>
<td>89</td>
<td>-</td>
<td></td>
<td>7-108</td>
</tr>
<tr>
<td>Shouler</td>
<td>1985</td>
<td>96</td>
<td>94</td>
<td>0</td>
<td>0</td>
<td>1-50</td>
</tr>
<tr>
<td>Sangwan</td>
<td>1994</td>
<td>461</td>
<td></td>
<td>6.5</td>
<td>7</td>
<td>34</td>
</tr>
<tr>
<td>Van Tets</td>
<td>1994</td>
<td>312</td>
<td>100</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Aguilar</td>
<td>1996</td>
<td>108</td>
<td>92</td>
<td>-</td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>Belmontes</td>
<td>1999</td>
<td>24</td>
<td>-</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Perez</td>
<td>2006</td>
<td>28</td>
<td>100</td>
<td>7</td>
<td>-</td>
<td>24-52</td>
</tr>
<tr>
<td>Pescatori</td>
<td>2006</td>
<td>52</td>
<td>-</td>
<td>8.3</td>
<td>8.3</td>
<td>10</td>
</tr>
<tr>
<td>Van Koperen</td>
<td>2008</td>
<td>109</td>
<td>-</td>
<td>7</td>
<td>4.0</td>
<td>7-134</td>
</tr>
<tr>
<td>Ortiz</td>
<td>2008</td>
<td>115</td>
<td>-</td>
<td>2</td>
<td>6</td>
<td>42</td>
</tr>
</tbody>
</table>

**Healing % is great (75-100)**

**But**

**Incontinence % is not (0-45)**
Fistulotomy + Marsupialization

2 Randomized controlled trials.

• *Improve healing.*
• *Decrease bleeding.*
Fistulotomy:

- Excellent healing rates
- Bad continence rates
- What to do?!?!?!?!?!?!?!?
So, what do the guidelines say?
**Fistulotomy alone**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fistulotomy should only be done in superficial fistula,</strong> Risk of incontinence increases with the amount of dissected sphincter. (grade B)</td>
<td></td>
</tr>
<tr>
<td><strong>Simple fistula-in-ano in patients with normal anal sphincter function may be treated with fistulotomy.</strong> (grade 1B)</td>
<td></td>
</tr>
</tbody>
</table>
| **Simple anal fistula should be treated by immediate fistulotomy.**
Grade of recommendation: 1B |
| **There is an important role for fistulotomy in the treatment of perianal fistula.** *(1b) Fistulotomy should in general not be used in high perianal fistula.*** |
| **Division of the external sphincter should always be undertaken with caution,** taking account of the sex of the patient, the position of the fistula, previous surgery and associated diseases (grade C). |
Marsupialization of the wound edges after fistulotomy has been associated with less postoperative bleeding and accelerated wound healing. It may also reduce the need for postoperative analgesics. (1A)

Marsupialization of the wound edges following fistulotomy is associated with shorter healing time. Grade of recommendation: 1B

Marsupialization after fistulotomy is associated with a significantly shorter healing time, wound edges of the laid open fistula track should be marsupialized to aid healing (grade 1A).
Fistulotomy score might be helpful?!

Proposal: a score to select patients for fistulotomy

R. Sjödahl
Department of Surgery, University Hospital, Linköping, Sweden

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Score ≤ 5 is safe to perform fistulotomy

Not widely used!!

Score range (0-25)
• Fistulotomy is **safely done** in all **superficial fistulas ± Marsupialization**.

• **In selected cases**, Fistulotomy is an **option** for **intersphincteric and low transsphincteric fistulas**, but should be done with **great caution** after careful assessment & informing the patient about the possible risks.
Fibrin sealant:

- A combination of fibrinogen, thrombin, and calcium in a matrix, which is injected into the fistula track.
- It heals the fistula by first inducing clot formation within the track and then encouraging growth of collagen fibres and healthy tissue.
- Proposed as sphincter saving technique.
Fibrin sealant:

- Success rates were very high in the beginning then it started to decrease with longer follow-up.

- Various reasons have been suggested to explain success or failure:
  - Dislodgement of the fibrin plug has been one of the most common proposed reasons.
  - Postoperative infection and abscess formation.
  - The length of the fistula tract has also been related to success or failure. While some surgeons have demonstrated higher success rates when using fibrin glue in long tracts (> 3.5 cm).

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Number</th>
<th>Success%</th>
<th>Follow up m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentovich</td>
<td>2000</td>
<td>20</td>
<td>85</td>
<td>10</td>
</tr>
<tr>
<td>Maralcan</td>
<td>2005</td>
<td>36</td>
<td>83</td>
<td>12</td>
</tr>
<tr>
<td>Patrlj</td>
<td>2000</td>
<td>69</td>
<td>74</td>
<td>28</td>
</tr>
<tr>
<td>Sentovich</td>
<td>2002</td>
<td>48</td>
<td>69</td>
<td>22</td>
</tr>
<tr>
<td>Lindsey</td>
<td>2002</td>
<td>42</td>
<td>63</td>
<td>4</td>
</tr>
<tr>
<td>Adams</td>
<td>2007</td>
<td>36</td>
<td>61</td>
<td>3</td>
</tr>
<tr>
<td>Witte</td>
<td>2007</td>
<td>34</td>
<td>55</td>
<td>7</td>
</tr>
<tr>
<td>Parades</td>
<td>2008</td>
<td>30</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>Gisbertz</td>
<td>2005</td>
<td>27</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>Dietz</td>
<td>2006</td>
<td>39</td>
<td>31</td>
<td>23</td>
</tr>
</tbody>
</table>

The only study analyzed fibrin glue vs conventional fistulotomy in simple fistula.
Fibrin sealant:

- Small RCT comparing glue vs fistulotomy
- Glue healing rates 3/6 (50%)
- Fistulotomy healing 7/7 (100%)
- No difference in incontinence
Fibrin glue (guidelines)

Fibrin glue is a relatively ineffective treatment for fistula-in-ano. Grade of Recommendation: Weak recommendation. evidence, 2B.

Simple anal fistula may be treated with novel techniques including fibrin glue, (LIFT), (VAAFT) and (FiLaC). Grade of recommendation: 2C

There is a place for fibrin glue in the treatment of complex perianal fistulae, although the efficiency remains unclear. It is unclear which patients should receive this treatment. Consensus, highest level of evidence 1b.

Simple anal fistulas may be treated by track debridement and fibrin glue injection (level III, grade B).
Collagen paste (**Permacol™**)

- The paste is made of acellular, porcine dermal collagen suspended in saline. When injected, the paste expands to fill the internal shape of the fistula, enabling closure of the channel.

- The fistula is de-epithelised and granulation tissue is removed, before being cleaned with dilute H₂O₂ followed by saline.

- The internal opening of the fistula is closed using resorbable stitches. The external opening is partially closed, to allow any inflammatory fluid to drain out without allowing the Permacol paste to escape.
Collagen paste (Permacol™)

- Early results of the MASERATI 100 study (10 European centers).
- 30 patients (13 intersphincteric, 17 transsphincteric).
- Overall healing rates at 1 year follow up: 54%.
  - Intersphincteric fistula healing rates: 67%.
- 18/29 (67%) were very satisfied, while 11 were dissatisfied.
- No significant change in fecal incontinence score.

Table 2: Patient demographics and fistula characteristics.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Permacol paste (N = 30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>48 (25–78)</td>
</tr>
<tr>
<td>Gender</td>
<td>30</td>
</tr>
<tr>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td></td>
</tr>
<tr>
<td>Recurrent fistula</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Fistula type per Patient</td>
<td></td>
</tr>
<tr>
<td>Body mass index (kg/m²) Less than or equal to 1/3</td>
<td></td>
</tr>
<tr>
<td>Level of internal opening</td>
<td></td>
</tr>
<tr>
<td>Above dentate line</td>
<td></td>
</tr>
<tr>
<td>At dentate line</td>
<td></td>
</tr>
<tr>
<td>Below dentate line</td>
<td></td>
</tr>
<tr>
<td>Length of fistula</td>
<td></td>
</tr>
<tr>
<td>Prior treatment of draining/loose seton</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (80%)</td>
</tr>
<tr>
<td>Time between placement and removal of seton (days)</td>
<td>173 (28–1437)</td>
</tr>
</tbody>
</table>

Data are expressed as n, n (%) or median (range).
Collagen paste (Permacol™)

- Final results of the MASERATI100 study.
- 100 patients (27 intersphincteric, 73 transsphincteric).
- Overall healing rates at 1 year follow up: 53.5%.
  - Intersphincteric fistula healing rates: 70.4%.
- No significant change in fecal incontinence score.
- By regression analysis, Intersphincteric fistulae were not associated with better healing.
Collagen paste (guidelines)

The current range of trials on the application of collagen paste for anal fistulas does not allow definite conclusions. Recommendation grade: C

Permacol injection may be used to treat complex anal fistula. In conclusion, there is insufficient information on this treatment. Grade of recommendation: 2B
Fisutla plugs

- **Surgisis©** biomedical product made of porcine small-intestinal submucosa.

- **Gore Bio-A©** is 100% synthetic bioabsorbable material Polyglycolic Acid: Trimethylene Carbonate (PGA:TMC).

- The fistula is cleaned with H2O2.

- Plug was inserted through the internal opening.

- Excess fistula plug was trimmed from both ends.

- The plug was secured at the internal opening.

- External opening left for drainage.

- Proposed as sphincter saving tech. for complex fistulae.
## Fisutla plugs

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Number</th>
<th>Follow up</th>
<th>Healing %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robb et al.,</td>
<td>2004</td>
<td>17</td>
<td>12 m</td>
<td>65%</td>
</tr>
<tr>
<td>Champagne</td>
<td>2006</td>
<td>46</td>
<td>12 m</td>
<td>83%</td>
</tr>
<tr>
<td>Poirier et al.,</td>
<td>2006</td>
<td>28</td>
<td>3 m</td>
<td>54%</td>
</tr>
<tr>
<td>Ky et al.,</td>
<td>2007</td>
<td>42</td>
<td>3 m</td>
<td>81%</td>
</tr>
<tr>
<td>Christoforidis</td>
<td>2007</td>
<td>57</td>
<td>3 m</td>
<td>40%</td>
</tr>
<tr>
<td>Cintron et al,</td>
<td>2007</td>
<td>28</td>
<td>3 m</td>
<td>54%</td>
</tr>
<tr>
<td>Abbas et al.,</td>
<td>2007</td>
<td>17</td>
<td>7 m</td>
<td>24%</td>
</tr>
<tr>
<td>Safar et al.,</td>
<td>2007</td>
<td>39</td>
<td>4 m</td>
<td>14%</td>
</tr>
<tr>
<td>Van koperen</td>
<td>2007</td>
<td>27</td>
<td>8 m</td>
<td>41%</td>
</tr>
<tr>
<td>Thekkinkattil</td>
<td>2007</td>
<td>38</td>
<td>6 m</td>
<td>39%</td>
</tr>
<tr>
<td>Herold et al.,</td>
<td>2008</td>
<td>18</td>
<td>6 m</td>
<td>39%</td>
</tr>
</tbody>
</table>
Fisutla plugs

The overall success rates were around 50% and decreasing by time. And also adoption rate is decreasing by time.
Fistula plug (guidelines)

Plugging has added a **new option** for the treatment of high anal fistula, but the healing rates are quite low. Nevertheless, it seems to be a secure and simple method resulting in low complication rates and minor disturbance of continence. Recommendation grade: B

The fistula plug is a **relatively ineffective** treatment for fistula-in-ano. Grade of Recommendation: Weak recommendation. Evidence, 2B.

Simple anal fistula **may be** treated with novel techniques including ..., ..., ..., ... and the anal fistula plug. Grade of recommendation: 2C

Fistula plugs are a **valid option** for treating perianal fistula. Evidence 1b

Did not mention
• Results are inconsistent and relatively ineffective.

• More importantly: relatively expensive options
  - Permacol & Plugs cost > 500 €
  - Even some plugs have been discontinued by the manufacturer.

• There might be a place for them in complex fistulae, but not in simple ones.

My Recommendation

This product has been discontinued.
Advancement flap
Advancement flap
(Technical considerations)

- Proposed as sphincter saving technique for complex fistulae.

The general key components:

- Create a flap that is sufficient to cover the internal opening.
- The base of the flap proximally should be at least twice its width at the apex.
- The flap is raised by a curvilinear incision around the dentate line.
- It is better not to extend the incision > 1/3 of the anal canal circumference to avoid stricture formation.
- Care should be taken not to raise a flap that is too thin.
- Flap should be sutured distal to the internal opening.

But,

Full thickness, partial or mucosal ???

Core out or curette the track ???
Advancement flap

- **26 studies** including **1655** patients.
- **Overall recurrence rate:** **21%**
  - Full thickness: **7.4% (best)**
  - Partial thickness: 19%
  - Mucosal: 30.1%
  - Coring-out & curettage had similar recurrence rates (19 vs 21%)

- **Overall incontinence rate:** **13.3%**
  - Full thickness: **20.4% (worst)**
  - Partial thickness: 10.2%
  - Mucosal: 9.3%
  - Coring-out & curettage had similar incontinence rates (14.3 vs 12%)
Advancement flap

Vs Fistulotomy --> No significant diff. in healing, incontinence, Recurrence, QOL.

The only study to separately report results of advancement flap in simple fistulae.
- 64 patients with simple fistula.
  - Healing rates 37/64 (57%).

No significant diff. in healing rates between complex and simple fistulae.
Application of local antibiotic gentamicin–collagen does not make any difference in terms of healing and recurrence.

Table 5 Flap repair for anal fistulae (n = 3).

<table>
<thead>
<tr>
<th>Study, Year</th>
<th>Participants</th>
<th>n</th>
<th>Interventions</th>
<th>Outcome</th>
<th>Follow-up</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho KS, 2005 [23]</td>
<td>High transsphincteric fistulae confirmed on preoperative ultrasound</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perez, 2006 [6]</td>
<td>Complex fistulae</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gustafsson, 2006 [7]</td>
<td>Intersphincteric or high anal fistulae</td>
<td>83</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n, study sample size.
Flap (guidelines)

All the guidelines reported the flap procedure as a sphincter saving technique for treatment of complex anal fistulae, as almost all the studies were on complex fistulae patients as we have seen.
- Flap procedure is a valid sphincter saving option in complex fistulae patients.

- In simple fistula, it can be used to treat an anal fistula where simple fistulotomy is thought likely to result in impaired continence or when the patient is refusing to accept the risk.