Rectovaginal and Rectourethral Fistulas

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Outline

- Rectovaginal fistula / Rectourethral fistula
  - Etiology
  - Symptoms
  - Evaluation
  - Treatment

Rectovaginal Fistula - Etiology

- Obstetric Injury
  - 0.1% of vaginal deliveries

- Inflammatory

- Malignancy

- Radiation (1-22%)

- Surgical complication

- Perineal Trauma / Foreign body

- Infection

- Congenital

From “A Cartoon Guide to Becoming a Doctor”

No disclosures
Symptoms RVF
- Passage of gas or stool via vagina
- Recurrent UTI
- Vaginitis
- Foul odor or discharge

Evaluation RVF
- Anorectal and vaginal exam
- Determine size and location
- Is it there??
  - Methylene blue enema
  - Water in vagina/proctoscopy
  - Contrast enema, X-ray of tampon
- Biopsy if history of radiation or cancer
- Colonoscopy
- Endoanal ultrasound

Treatment Criteria
- Classification of fistula
- Condition of surrounding tissue
- Status of anal sphincters
- Number of previous repairs

Classification RVF

<table>
<thead>
<tr>
<th>Classification</th>
<th>Diameter Range</th>
<th>Location</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>&lt; 2.5 CM</td>
<td>Low (near dentate line) Mid</td>
<td>Trauma Infection Obstetric</td>
</tr>
<tr>
<td>Complex</td>
<td>&gt; 2.5 CM</td>
<td>High (near cervix)</td>
<td>IBD Radiation Cancer Previous repairs</td>
</tr>
</tbody>
</table>
Obstetric RVF

- Episiotomy or infection of perineal wound
  - 0.1% incidence after episiotomy
- Prolonged labor resulting in necrosis
  - 50% will heal, wait at least 6 months

Mattingly, Telinde’s Operative Gynecology 1992

In your bag of tricks...

- Transanal
  - Fistulectomy
  - Mucosal advancement flap
  - Anocutaneous advancement
  - Transanal sleeve advancement
- Transperineal
  - Perineoproctectomy
  - Sphincteroplasty
  - Tissue interposition
  - Transvaginal repair
    - Fistula inversion
    - Vaginal advancement flap

Rectal Mucosal Advancement Flap

Anal sphincter integrity and function influences outcome in RVF repair

- 52 women, 62 repairs
- 35 sphincteroplasty, 27 RAF
- Success rates
  - 80% sphincteroplasty vs 41% RAF (p=0.02)
  - Among sphincteroplasty, 90% vs 33% success when levatorplasty done
  - Among incontinent patients 84% sphincteroplasty vs 33% RAF

Tsang, Madoff, Wong, Rothenberger, Finne, Singer, Lowry DCR 1998
Perineoproctotomy

Dissection up to the fistula, then repair in multiple layers
100% success rates in several series
Gordon, Principles and Practice of Surgery, 3rd ed

Why did it fail?

- Technical Factors
  - Thickness
  - Tension
  - Blood supply/flap width
- Perioperative Factors
  - Bowel prep
  - Antibiotics
  - Use of seton preoperatively
  - Diverting stoma

Patient factors
- Age
- Sex
- BMI
- Crohn's disease
- Immunosuppression
- Smoking
- Number of previous repairs

Effect of Smoking

N=105 advancement flaps, healing 60% smokers vs 79% nonsmokers, p=0.05
Zimmerman, BJS 2003
Effect of Crohn’s Disease

Recurrence Rates

<table>
<thead>
<tr>
<th>Cryptoglandular</th>
<th>Crohn’s disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mizrahi 2002</td>
<td>N=41, 3%</td>
</tr>
<tr>
<td></td>
<td>N=28, 57%</td>
</tr>
</tbody>
</table>

Pilot study for injection of adalimumab in perianal Crohn’s disease: 3 pts with ano-vaginal fistula had complete cessation of drainage, confirmed on MRI, mean f/u 17.5 months. Tonelli et al. DCR Aug 2012

Complex or high RVF

- First things first—treat malignancy or IBD
- Diversion to control sepsis and symptoms
- Options
  - LAR or coloanal
  - Transabdominal fistulectomy and layered closure
  - Omental interposition
  - Tissue interposition—Martius, Gracilis

Tissue Transfer Procedures

RVF

- Large obstetric fistula
- Pouch-vaginal fistulas
- Multiple previous repairs
- Radiation induced
- Crohn’s disease

Martius Flap

- For radiation induced RVF, with colostomy, 84% success (N=16) Boronow WJS 1986
- Other series success rate for RVF 43-75%

Aartsen EJ, Eur J Surg Oncol, 1986
**RVF Treatment Summary**

<table>
<thead>
<tr>
<th>Simple</th>
<th>≤ 2.5 CM</th>
<th>Low Mid Obstetric Trauma</th>
<th>Endoanal advancement flap Sphincteroplasty Perineoproctotomy</th>
</tr>
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<tbody>
<tr>
<td>Complex</td>
<td>&gt; 2.5 CM</td>
<td>High IBD Radiation Cancer Previous repairs</td>
<td>Tissue interposition Abdominal approach Colostomy</td>
</tr>
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**Rectourethral Fistulas**
- Congenital
- Perineal trauma/Pelvic fracture
- Malignancy or IBD
- Surgery or radiation for prostate cancer

**Etiology RUF**
- 0.1-3% of radiation pts
- 50% of RUF are due to radiation
- Mostly for prostate CA
  - ablative therapies (cryotherapy or high intensity focused US)
  - XRT
- **Avoid rectal biopsy or elective anal surgery**
Symptoms RUF

- Recturia 73%
- Hematuria 54%
- Fecaluria
- Pneumaturia 34%
- Chronic UTI 68%
- Rarely sepsis or necrotizing fasciitis

Evaluation RUF

- Digital exam, anoscopy
- Cystoscopy and proctoscopy
  - Urethral stricture?
- Retrograde urethrogram
- BE
- ?biopsy
- CT 60% accurate
- Assess fecal and urinary incontinence

Rectourethral Fistulas

![Image of rectourethral fistula]

- Rectum
- Fistula
- Bladder

Treatment RUF

- Joint approach with urologist (address urethral strictures)
- +/- diversion
  - Large >2cm, multiple comorbidities
  - Helps decrease inflammation when done in advance
Approaches for repair of rectourethral fistulas

- Transabdominal
  - Laterosacral - Kraske
- Posterior Transphincteric - York-Mason
- Transanal (Latzko)

Transsphincteric Approach
York- Mason

- Paracoccygeal incision
- Excellent exposure
- Can excise fistula tract
- Transects muscles
- 88-100% success nonradiated pts

Effect of Prior Radiotherapy and Ablative Therapy on Surgical Outcomes for the Treatment of RUF

- Mayo Clinic-45 consecutive pts, 1998-2010
- N=29 s/p radiation
  - Median fistula size 3 cm
  - 79% cystectomy with urinary diversion
  - 6 patients had bladder sparing procedure-- 4 required permanent urinary diversion later for recurrence
- N=16 postoperative, Crohn’s, trauma
  - Median fistula size 0.5cm
  - 60% perineal approach, 13% York-Mason, 13% transabdominal
  - 87% initial success

Transperineal Management of Post-Surgical and Radiated Rectourethral Fistulas
Voelzke, McAninch, Breyer, Glass, Garcia-Aguilar J Urol 2013

- UCSF retrospective review 1998-2011
- N=23
- All had urinary and fecal diversion.
- 30% each group had urethral stricture
- Key technical factor is tension free closure of both sides of fistula
- 10 postoperative RUF—100% success, 2 had dartos muscle flaps
- 13 post radiation/energy ablation, 62% success, 5 had muscle flaps
Problems to consider…

- Transsphincteric and transanal
- Difficult exposure
- Hard to mobilize rectal and urethral tissue with fibrosis
- Can’t fix concurrent urethral stricture or place muscle flap
- Advancement flaps used less because bladder is high pressure side

Current treatment RUF

- Local repair
- Starting to favor transperineal approach
- Interposition muscle flaps
  - For previous failed repairs or large (>2cm)
  - For RUF from radiation/energy ablation

Gracilis Rotational Flap

Dartos flap

Rectal wall opening

Repairsurethral opening

Tacking suture for dartos pedicle
Dartos Flap

• UCSF series of 8 patients
• All but one had colostomy
• 6/8 healed
  • 2 failures had infectious and radiation etiology

Varma et al, 2005

Systematic Review RUF

Hechenbleikner, Buckley, Wick. DCR 2013

N 416

Radiated N=169 (40%)
Surgical repair N=375 (90%)
Transanal repair 22 (5.9%)
Transabdominal repair 47 (12.5%)
Transphincteric repair 59 (15.7%)
Transperineal repair 247 (66%)

Tissue flap (Gracilis, dartos, omental) 269 (72%)
(G=196, D=46, O=23)

Success rate 328 (87.5%)
Permanent FD 37 (10.6%)
Permanent UD 31 (8.3%)

Gracilis #1 flap repair—91% success rate
Dartos flap 90% closure (18/20)

Systematic review RUF

<table>
<thead>
<tr>
<th>Study Type</th>
<th>Transanal Failure Rate</th>
<th>Transabdominal Failure Rate</th>
<th>Transsphincteric Failure Rate</th>
<th>Total Failure Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiated</td>
<td>75% (n=4)</td>
<td>15% (n=13)</td>
<td>5% (n=38)</td>
<td>9% (n=44)</td>
</tr>
<tr>
<td>Nonradiated</td>
<td>0% (n=2)</td>
<td>7% (n=29)</td>
<td>25% (n=4)</td>
<td>25% (n=4)</td>
</tr>
<tr>
<td>Mixed</td>
<td>38% (n=16)</td>
<td>40% (n=5)</td>
<td>24% (n=17)</td>
<td>10% (n=199)</td>
</tr>
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Hechenbleikner, Buckley, Wick. DCR 2013

Nonradiated patients
• 4% permanent FD and 4% permanent UD

Irradiated patients
• 26% permanent FD and 44% permanent UD

Mixed studies
• 10% permanent FD and 4% permanent UD

Hechenbleikner, Buckley, Wick. DCR 2013
Thorough preoperative exam and studies are important for planning approach

Be prepared with an array of procedures

Perineal approaches are favored for exposure and preservation of continence

Due to radiation or other factors that affect wound healing, muscle flaps may be needed