Obstetrical Fistulas

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Obstetrical Fistulas

- Preventable
- Treatable
**Obstetrical Fistulas**

- Result from prolonged, obstructed and neglected labor
- Coupled with a lack of medical intervention to relieve it

**Obstetrical Fistulas**

**Definition**

- Tissue destruction due to prolonged pressure of the head during obstructed labor (ischemic lesion).
- Tissue laceration during instrumental delivery, cesarean section or cesarean hysterectomy.
Maternal Morbidity & Mortality

Table 4.1 Incidence of major complications of childbirth, worldwide

<table>
<thead>
<tr>
<th>Complication</th>
<th>Incidence (% of live births)</th>
<th>Number of cases per year</th>
<th>Case-fatality rate (%)</th>
<th>Maternal deaths in 2000</th>
<th>Main causes of morbidities</th>
<th>DALYs lost (10000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum haemorrhage</td>
<td>10.5</td>
<td>13.756.000</td>
<td>1</td>
<td>132.000</td>
<td>Severe anaemia</td>
<td>4,410</td>
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<td>Sepsis</td>
<td>4.4</td>
<td>5.768.000</td>
<td>1.3</td>
<td>79.000</td>
<td>Infertility</td>
<td>6,900</td>
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<tr>
<td>Pre-eclampsia and eclampsia</td>
<td>8.2</td>
<td>4.152.000</td>
<td>1.7</td>
<td>63.000</td>
<td>Not well evaluated</td>
<td>2,310</td>
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<tr>
<td>Obstructed labour</td>
<td>4.6</td>
<td>6.089.000</td>
<td>0.7</td>
<td>42.000</td>
<td>Fistula, insufficiency</td>
<td>2,851</td>
</tr>
</tbody>
</table>

Source: [15].

WHO, 2005

Maternal Mortality Ratios

Figure 4.2 Maternal mortality since the 1960s in Malaysia, Sri Lanka and Thailand

WHO, 2005
Objectives

- Overview clinical literature
- Review reported evaluation, management and outcomes
- Identify complications of treatment
- Introduce elements of classification
- Propose clinical points of discussion

Key Points

- Overview
- Evaluation issues
- Management issues
- Outcomes issues
- Unresolved issues
Overview

Obstetrical Fistulas

- Obstructed neglected labor
- Difficult operative delivery
- Traditional surgical practices
- Pelvic immaturity
- Nutritional deficiencies
- Socio-cultural factors
Predisposing Conditions

- Early age at labor with pelvic immaturity
- Android or anthropoid pelvis
- Genital mutilation
- Cultural and social factors impeding care
- Economic factors impeding access and availability of care

Fistula Development (I)

- Anterior vaginal wall, bladder base and urethra are compressed between the fetal head and the posterior surface of the pubis
- In prolonged obstructed labor, pressure necrosis of the anterior vaginal wall and the underlying bladder neck occurs
- More extensive necrosis involves urethra, trigone and anterior cervix
Fistula Development (II)

- If mother survives, a macerated fetus is expelled 3-4 days later
- Sloughing of devitalized tissue (bladder, vagina) 10 days later
- Wide area of pressure results in an anatomical area widely affected by scarring and devascularization

Types of Obstetrical Fistulas (Elkins)

- **Vesicouterine (cervical)**- c/s and inlet
- **Juxtacervical**- obstruction at pelvic inlet
- **Midvaginal**- midpelvic obstruction
- **Suburethral**- base of pubic bone
- **Total urethral loss**- obstruction at pelvic outlet
- **Combined VVF-RVF**- long and obstructed labor
- **Ureterovaginal**- C/S & C/H
Obstetric Labor Injury Complex

- Urological
- Gynecological
- Rectal
- Orthopedic
- Neuro-vascular
- Dermatological
- Psychological

- Arrowsmith, Hamlin & Wall, 1996

Extent of Injury

- Isolated VVF are more common than combined VVF & RVF (n=309)
  - 78% VVF, 15% VVF & RVF, 7% RVF
  - 70% complicated
    - Much scarring
    - Total destruction of urethra
    - Ureteric orifices at edge or outside fistula
    - Small bladder
    - VVF & RVF
    - Presence of calculi

- Kelly, 1993
Obstetrical Fistulas

- Very little scientific research published
  - Remote areas
  - Limited resources

- Only one RCT (n=79) on IV AB - no benefit regarding success or incontinence

- One comparative retrospective study (n=49) - better results with Martius

Unresolved Issues
- Epidemiology

- No standard data collection
  - Facility vs. Population based

- No standard reporting
  - Difficult cross-study comparisons

- No supported conclusion on impact of:
  - Decreasing age of marriage
  - Delaying the first birth
  - Family planning use
  - Antenatal and birth care
Unresolved Issues
-Physiopathology-

- No studies on fistula prevention and role of:
  - Age
  - Parity
  - Degree of necrosis

- No standard classification

Evaluation Issues

- Low tech
- Complete
Historical Periods

- “Pre-leak” (1000 BC-1300 AD)
- “Mend-the-leak” (1300-1940)
- “Mega-leak” (1940-1990)
- “Para-leak” (1990-2000)
- “Never-leak” (2000)

Elkins, 1997

Investigation

- Confirm extraurethral urinary leakage
- Visualize leakage site(s)
- Assess vaginal mobility, length & scars
- Assess bladder capacity, neck and upper tract
- Assess perineum
- Use liberal sedation or EUA
Physical Findings in VVF

123 patients with VVF (Senegal)
10 associated fistulas
  5 vesicouterine fistulas
  4 rectovaginal fistulas
  1 ureterovaginal fistula
50% associated lesions
  (vagina, urethra, bladder, perineum)
34% radiological anomalies
  • Gueye, 1992

Preoperative Considerations

- Accurate diagnosis
- Recognize associated abnormalities
- Timing of surgery
Associated Pathology (I)

- Sphincteric abnormalities
- Secondary fistula
- Urethral defects
- Ureteral fistula / obstruction

Coexistent ureteric injuries in 10-15% of patients with VVF

Frequency of Urethral Destruction

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th># cases</th>
<th>% urethral destruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Couvelaire</td>
<td>1953</td>
<td>131</td>
<td>20.6</td>
</tr>
<tr>
<td>Carayon et al.</td>
<td>1962</td>
<td>225</td>
<td>52.0</td>
</tr>
<tr>
<td>Docquier</td>
<td>1982</td>
<td>280</td>
<td>24.2</td>
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<tr>
<td>Chiche et al.</td>
<td>1983</td>
<td>578</td>
<td>9.8</td>
</tr>
<tr>
<td>Benchekroun et al.</td>
<td>1987</td>
<td>600</td>
<td>31.0</td>
</tr>
<tr>
<td>Loran et al.</td>
<td>1991</td>
<td>903</td>
<td>9.1</td>
</tr>
<tr>
<td>Falandry</td>
<td>1996</td>
<td>672</td>
<td>17.7</td>
</tr>
</tbody>
</table>
Associated Pathology (II)

- Genital prolapse
- Low bladder compliance
- Detrusor instability

Unresolved Issues

-Diagnosis-

- No standard evaluation
- No standard identification of co-morbidities
  - Foot drop
  - Fecal incontinence
  - POP
  - UTI
  - Amenorrhea
  - Sexual dysfunction
Management Issues

- Preventive measures
- Optimal approaches
- Comprehensive care

Management

- Immediate drainage
- Local cutaneous care +/- infection treatment
- Nutritional care
- Counseling and consent
- Surgical treatment
- Postoperative care
- Rehabilitation and reintegration
Preoperative Care

- Adequate diagnosis
- Treat infections (schistosomiasis, malaria, TB, LGV)
- Treat anemia
- Good nutrition
- Estrogen therapy
- Remove stones (6 weeks)
- AB ? (RCT - Tomlinson, 1998)

Timing of Repair

- **First attempt most successful!**

- Mature fistula concept - Sims
  - 2-4 months
  - Initial drainage results in few closures

- Immediate repair to prevent social ostracism
  - 170 consecutive patients <3 months
  - Closure (n=156) & continence (n=146) - Waaldijk
Early Repair

- Exam every 2 weeks for pliability—usually 4-8 weeks after injury (Carr & Webster, 1996)
- In recurrent fistulas, liberal use of Martius graft and interval 3-6 months post repair (Rangnekar et al., 2000)

Route of Repair

- Vaginal
- Abdominal
- Combined (vaginal & abdominal)
- ? Laparoscopic
General Principles of Repair

- Adequate operative exposure
- Tension free, multiple layer closure
- Bladder drainage
- +/- Pedicle graft interposition

Vaginal Repair

- Preferred method
- Absence of need for abdominal repair
**Indications for Vaginal Repair**

- Simple fistula
- Urethral fistula
- Absent CI:
  - Poor exposure
  - Vaginal scarring & stenosis
  - Small bladder
  - Abdominal pathology
  - Need for ureteral reimplantation

**Abdominal Repair**

- Most complex fistulas
- Complicated fistulas

**Disadvantage:**
- Cost
- Complications
Indications For Abdominal Repair

- Insufficient vaginal size
- Inadequate operative exposure
- Ureteral fistula / obstruction
- Access omental graft
- Concomitant abdominal pathology
- Low bladder compliance

Operative Technique - Abdominal Repair -

- Catheterize ureters
- Circumscribe fistula
- Dissect bladder wall flaps
- Omental interposition
Combined Repair

- When single route inadequate (poor exposure) or insufficient (not successful)
- When previously failed trigonal or supratrigonal repair
- When omental interposition necessary while fistula exposed from below

Requirements For Successful Technique (I)

- Freedom from local infection/inflammation
- Identification of all fistulas and pathology
- Adequate exposure
- Wide mobilization of vagina & bladder
- Fistula excision not always necessary
- Use of appropriate suture material outside bladder mucosa
Requirements for Successful Technique (II)

- Tension-free closure of bladder (multiple layers)
- Graft when indicated
- Post-operative bladder drainage
- Continent diversion may be necessary after multiple failed attempts

- ? When primary diversion

Surgical Graft Techniques

- Labial fat and BC muscle (Martius)
- Full thickness labial graft
- Rectus muscle flap
- Gracilis muscle
- Omental pedicle
- Peritoneal flap
- Free blabber mucosal autograft
  - No randomized data
Urinary Diversions

- Extremely limited acceptability-
  - 0.6% of 2484 patients (Hilton/Nigeria)

- Short and long term morbidity
  - 1/7 fatality; 1/7 reoperation day 10

- Risk of metabolic, infectious, obstructive and renal disorders

- Long term complications in remote situations (Hodges/Uganda)

Postoperative Care

- Adequate bladder drainage 2-3 weeks
- High fluid input and output
- Postoperative AB prophylaxis
- Avoid excessive activity 4-6 weeks
- Perineal hygiene
- Pelvic rest 3 months
Complications of Treatment

- Persistent incontinence
- Gynatresia
- Dyspareunia
- Ureteric injury
- Irritative lower tract symptoms
- Small scarred bladder

Postoperative Morbidities

- Amenorrhea
- Anuria
- Atresia
- Bladder stones
- Gynatresia
- Incontinence (urinary or fecal)
- Leg weakness
- Superficial wound infection
- Urinary retention
- Urinary tract infection
Amenorrhea

- Pituitary-hypothalamic dysfunction (63%)
- Asherman’s syndrome
- Sheehan’s syndrome
- PID

Amenorrhea several months to 15 yrs in 66 patients; in 55 of these, menses returned within 6 months after repair. (Evoh, 1979)

Postoperative Complications (I)

- 56 patients repaired
  - 10 mild SUI, 3 type II, 5 type III
  - 8 DI
  - 8 Gynatresia
  - 10 dyspareunia
  - 8 foot drop
  - 4 amenorrhea

- Elkins, 1994
Postoperative Complications (II)

- When at UVJ:
  - 40% SUI
  - 2% vs. 20% hemorrhage when juxtacervical

- When midvaginal:
  - 60% gynatresia &/or small bladder with instability
  - Elkins, 1994

Management Factors

- Comprehensive evaluation
- Fixity of vaginal structures
- Experience and surgical skills
- Previous attempts
- Late referral
- Mobilization of tissues
- Layer closure without tension
- Treat infections: malaria, TB, LGV, Schistosomiasis
**Unresolved Issues -Management-**

- Timing of repair
- Route of repair
- Newer techniques
- Techniques for incontinence
- Postoperative care
- Unmet needs of surgical treatment
- Management of complications

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**Outcome Issues**

- Predictive factors
- Definition of success
- Standard reporting
### Overall Success Rates

<table>
<thead>
<tr>
<th>Author</th>
<th># cases</th>
<th>% success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wachawan</td>
<td>163</td>
<td>59.1</td>
</tr>
<tr>
<td>Rathee</td>
<td>49</td>
<td>71.4</td>
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<tr>
<td>Falandry</td>
<td>261</td>
<td>81.2</td>
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<tr>
<td>Ghororo</td>
<td>48</td>
<td>81.3</td>
</tr>
<tr>
<td>Enquete Afu</td>
<td>418</td>
<td>82.0</td>
</tr>
<tr>
<td>Docquier</td>
<td>394</td>
<td>83.0</td>
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<tr>
<td>Benchekroun</td>
<td>598</td>
<td>84.0</td>
</tr>
<tr>
<td>Rafique</td>
<td>42</td>
<td>85.7</td>
</tr>
<tr>
<td>Gueye</td>
<td>111</td>
<td>86.0</td>
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<td>Bhattacharya</td>
<td>62</td>
<td>87.1</td>
</tr>
<tr>
<td>Kelly &amp; Kwast</td>
<td>309</td>
<td>88.0</td>
</tr>
<tr>
<td>Muleta</td>
<td>1210</td>
<td>92.6</td>
</tr>
<tr>
<td>Elkins</td>
<td>100</td>
<td>95.0</td>
</tr>
<tr>
<td>Hilton</td>
<td>2484</td>
<td>97.7</td>
</tr>
<tr>
<td>Waaldjik</td>
<td>1716</td>
<td>98.5</td>
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</tbody>
</table>

### Outcome- Primary Repair (I)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Procedure</th>
<th>Author</th>
<th>Year</th>
<th># cases</th>
<th>Success rate (%)</th>
<th>% Incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal</td>
<td>Transvaginal flapsplitting</td>
<td>Wadhawan</td>
<td>1983</td>
<td>82</td>
<td>59.1</td>
<td>17%</td>
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<tr>
<td></td>
<td>Latzko Martius</td>
<td>Elkins</td>
<td>1988</td>
<td>31</td>
<td>77.0</td>
<td>3%</td>
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<tr>
<td></td>
<td>Latzko + Martius Mobilization</td>
<td>Elkins</td>
<td>1988</td>
<td>31</td>
<td>77.0</td>
<td>3%</td>
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<tr>
<td></td>
<td>Chassar Moir</td>
<td>Enzelberger</td>
<td>1991</td>
<td>42</td>
<td>98.0</td>
<td>2%</td>
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<td>Carreras</td>
<td>2001</td>
<td>27</td>
<td>87.0</td>
<td>3%</td>
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<tr>
<td></td>
<td>Chassar Moir + Martius</td>
<td>Falandry</td>
<td>1992</td>
<td>230</td>
<td>87.4</td>
<td>7.4</td>
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<td></td>
<td>Martias Mobilization</td>
<td>Kelly</td>
<td>1998</td>
<td>1138</td>
<td>84.7</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>Gracilis muscle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urethral reconstruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ureter reimplantation</td>
<td></td>
<td></td>
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## Outcome- Primary Repair (II)

<table>
<thead>
<tr>
<th>Approach</th>
<th>Procedure</th>
<th>Author</th>
<th>Year</th>
<th>Total # cases</th>
<th>Success rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal</td>
<td>Vesical autoplasty; transvesical, extraperitoneal or transperitoneovesical</td>
<td>Gil-Vernet</td>
<td>1989</td>
<td>39</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>Transvesical, simple layered</td>
<td>Motiwala</td>
<td>1991</td>
<td>58</td>
<td>95.0</td>
</tr>
<tr>
<td></td>
<td>Transperitoneal +/- omental flap</td>
<td>Motiwala</td>
<td>1991</td>
<td>10</td>
<td>90.0</td>
</tr>
<tr>
<td></td>
<td>Modified O’Conor – transvesical, no flap</td>
<td>Moriel</td>
<td>1993</td>
<td>16</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td>O’Conor</td>
<td>Demirel</td>
<td>1993</td>
<td>17</td>
<td>94.0</td>
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</table>

## Outcome Primary Repair

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Total # cases</th>
<th>Success rate (%)</th>
<th>Incontinence (%) after successful closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bird</td>
<td>1967</td>
<td>70</td>
<td>71.0</td>
<td>10.0</td>
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<tr>
<td>Ashworth</td>
<td>1973</td>
<td>152</td>
<td>74.0</td>
<td>12.0</td>
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<td>Kelly</td>
<td>1983</td>
<td>248</td>
<td>83.0</td>
<td>10.0</td>
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<tr>
<td>Ahmad</td>
<td>1988</td>
<td>325</td>
<td>61.0</td>
<td>-</td>
</tr>
<tr>
<td>Martey</td>
<td>1989</td>
<td>100</td>
<td>95.0</td>
<td>-</td>
</tr>
<tr>
<td>Ojengbede</td>
<td>1989</td>
<td>150</td>
<td>90.0</td>
<td>-</td>
</tr>
<tr>
<td>Lawson</td>
<td>1989</td>
<td>369</td>
<td>75.0</td>
<td>-</td>
</tr>
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<td>Waaldijk</td>
<td>1989</td>
<td>500</td>
<td>88.0</td>
<td>11.0</td>
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<tr>
<td>Ward</td>
<td>1989</td>
<td>1789</td>
<td>85.0</td>
<td>-</td>
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<tr>
<td>Kelly &amp; Kwast</td>
<td>1993</td>
<td>309</td>
<td>88.0</td>
<td>6.2</td>
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<td>Waaldijk</td>
<td>2004</td>
<td>1716</td>
<td>95.2</td>
<td>6.5</td>
</tr>
</tbody>
</table>
Outcome

- No standard definition of success!
  - Closure of fistula
  - Repair incontinence
  - Restore ability to have sexual intercourse
  - Return of menstruation
  - Re-integration into society

Predictors of Adverse Outcome

- Subjective observations of moderate to severe scarring or damage to urethra or bladder neck (Arrowsmith)
- Type of fistula and state of perifistular tissues, but also 1st procedure (Gueye)
- Location most significant (Gassesew)
- # previous attempts, severity, health, facilities, experience & expertise (Kelly)
### Differences between fistula repairs resulting in failure or cure at the Addis Ababa Fistula Hospital 1987-1988

<table>
<thead>
<tr>
<th>Fistula characteristics</th>
<th>Failure (n=71)</th>
<th>Cure (n=1096)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Ruptured Uterus</td>
<td>12</td>
<td>17.1</td>
</tr>
<tr>
<td>Limb Contractures</td>
<td>6</td>
<td>8.5</td>
</tr>
<tr>
<td>Preoperative Feeding</td>
<td>26</td>
<td>38.6</td>
</tr>
<tr>
<td>≥ 4 Attempts at Repair</td>
<td>7</td>
<td>9.9</td>
</tr>
<tr>
<td>Transfusion Blood/Plasma</td>
<td>64</td>
<td>90.1</td>
</tr>
<tr>
<td>Anesthesia in Addition to Spinal</td>
<td>58</td>
<td>81.7</td>
</tr>
<tr>
<td>Fistula Complicated (much scarring, total destruction of the urethra, ureteric orifices at the edge of, or outside the fistula, small bladder, RVF associated, calculi)</td>
<td>71</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* p<0.001; ** p<0.0005

- Kelly & Kwast, 1993

### Outcome With Graft

<table>
<thead>
<tr>
<th>Type of fistula</th>
<th>Martius flap (n=21)</th>
<th>Anatomic repair (n=25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healed</td>
<td>Incontinent</td>
</tr>
<tr>
<td>Urethrovaginal fistula involving bladder neck (n=12)</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Vesicovaginal fistula (n=34)</td>
<td>13</td>
<td>0</td>
</tr>
</tbody>
</table>

- Rangnekar et al., 2000
### Outcome - Recurrent Fistulas

<table>
<thead>
<tr>
<th># repairs</th>
<th>Type of prior procedure</th>
<th>Procedure at last repair attempt</th>
<th>Author</th>
<th>Year</th>
<th># cases</th>
<th>Success rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-7</td>
<td>Abdominal</td>
<td>Abdominal (vesical autoplasty, omental graft)</td>
<td>Gil-Vernet</td>
<td>1989</td>
<td>42</td>
<td>100.0</td>
</tr>
<tr>
<td>1-3</td>
<td>Abdominal (O’Conor) Or Vaginal (Martius)</td>
<td>Abdominal (O’Conor) Or Vaginal (Martius)</td>
<td>Arrowsmith</td>
<td>1994</td>
<td>98</td>
<td>96.0</td>
</tr>
<tr>
<td>1, 2</td>
<td>Unreported procedures</td>
<td>Hilton</td>
<td>2003</td>
<td>2484</td>
<td>81.0/65.0</td>
<td></td>
</tr>
<tr>
<td>1, 2, ≥3</td>
<td>Unreported procedures</td>
<td>Lawson</td>
<td>1989</td>
<td>54/30/9</td>
<td>70.0/66.7/33.3</td>
<td></td>
</tr>
</tbody>
</table>

### Treatment Success

- **When is success defined:**
  - At discharge? 7-14 days
  - Long term? > 6 months

- **Single vs. Multiple repair operations:**
  - Report success for 1st, 2nd, 3rd, etc
  - Report success combined rate for all operations
## Outcome - # Procedures

<table>
<thead>
<tr>
<th>Outcome &amp; # procedures</th>
<th>% patients</th>
<th>% cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry (1)</td>
<td>81.0 % (n=79)</td>
<td>81.0 %</td>
</tr>
<tr>
<td>Dry (2)</td>
<td>8.0 % (n=8)</td>
<td>89.0 %</td>
</tr>
<tr>
<td>Dry (3)</td>
<td>4.0 % (n=4)</td>
<td>93.0 %</td>
</tr>
<tr>
<td>Dry (&gt;3)</td>
<td>3.0 % (n=3)</td>
<td>96.0 %</td>
</tr>
<tr>
<td>Incontinent</td>
<td>4.0 % (n=4)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.0 % (n=98)</td>
<td></td>
</tr>
</tbody>
</table>

- Arrowsmith, 1993

## Fistula Cure

- For a 100% cure, the following conditions must be fully satisfied:
  - Complete continence by day and night
  - Bladder capacity > 170ml
  - No SIU
  - Normal coitus without dyspareunia
  - No traumatic amenorrhea
  - Ability to bear children

- Coetzee & Lightgow, 1996
Subsequent Pregnancy (I)

- C/S
- 12 of 33 patients pregnant within 1 year of repair delivered vaginally
- Criteria for vaginal delivery:
  - Non-recurring cause of obstructed labor
  - Graft interposition at closure
  - In-hospital closely supervised delivery

  - Kelly, 1979

Subsequent Pregnancy (II)

- Determinant factors of success
  - Antenatal supervision, nutrition, UTI Rx
  - Improved maternal education
- Elective C/S for all fistula patients
- Elements of continued improvement
  - Continued education against harmful socio-cultural practices that prevent antenatal care and early use of Ob care

  - Emembolu, 1992
**Unresolved Issues**

- **Outcome**
  - No standard definition of cure
  - No standard classification
  - No standard reporting system
    - Time
    - Number of procedures and type
    - Type of fistula repair
    - Associated morbidities

**Classification**

- Anatomy
- Function
- Surgical complexity
- Outcome predictability
# Classification systems for VVF

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Classification</th>
</tr>
</thead>
</table>
| 1852 | Simms        | 1. Uethro-vaginal, confined to urethra  
               | 2. Fistula at bladder neck or root of urethra  
               | 3. Body & floor of bladder destroyed  
               | 4. Utero-vesical fistula              |
| 1958 | McConnachie  | Grade 1: Normal, healthy tissues  
               | Grade 2: Mild scarring  
               | Grade 3: More scarring, poor vaginal access  
               | Grade 4: Repeat repair  
               | Grade 5: Inoperable per vagina  
               | Type A: Less than 1 cm diameter  
               | Type B: Over 1 but less than 2 cm diameter  
               | Type C: Over 2 cm diameter  
               | Type D: Any of above type with rectovaginal fistula |
               | 2. Simple recto-vaginal fistula  
               | 3. Simple urethra-vaginal fistula  
               | 4. Vesico-uterine fistula  
               | 5. Difficult high recto-vaginal fistula  
               | 6. Difficult urinary fistula - complex |
| 1972 | Lawson       | 1. Juxtaurethral  
               | 2. Vault  
               | 3. Mid-vaginal  
               | 4. Juxtacervical |
| 1985 | Tahzib       | 1. Juxta-urethral  
               | 2. Mid-vaginal  
               | 3. High  
               | 4. Massive  
<pre><code>           | 5. Other |
</code></pre>
<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Gueye</td>
<td>1. Simple - far from ureters, urethra intact</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Complex – partial or total loss of urethra</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Complicated – total loss of urethra +/- RVF</td>
</tr>
<tr>
<td>1992</td>
<td>Iloabachie</td>
<td>1. Juxta urethral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Juxta cervical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Gynecological</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Giant fistula</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Mid vaginal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Vesico uterine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Elkins</td>
<td>1. Vesico-cervical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Juxta-cervical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Mid-vaginal vesico-vaginal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Sub-urethral vesico-vaginal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Urethro-vaginal</td>
</tr>
<tr>
<td>1995</td>
<td>Waaldijk</td>
<td>1. fistula not involving closing mechanism</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II Aa - fistula involving closing mechanism, without (sub)total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>urethra &amp; without circumferential defect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II Ab - fistula involving closing mechanism, without (sub)total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>urethra &amp; with circumferential defect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II Ba - fistula involving closing mechanism, with (sub)total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>urethra &amp; without circumferential defect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>II Bb - fistula involving closing mechanism, with (sub)total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>urethra &amp; with circumferential defect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>III - involving ureter &amp; other exceptional fistulas</td>
</tr>
<tr>
<td>Year</td>
<td>Author</td>
<td>Classification</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>----------------</td>
</tr>
<tr>
<td>1994</td>
<td>Hilton</td>
<td>1. Simple&lt;br&gt;2. Complex – poor access for repair, significant tissue loss, ureteric involvement, coexistent RVF.</td>
</tr>
<tr>
<td>2004</td>
<td>Browning</td>
<td>1. Simple - minimal vaginal scarring and good bladder volume&lt;br&gt;2. Complex - severe vaginal scarring and/or reduced bladder volume, needing some degree of vaginoplasty or even reconstruction of the vagina.</td>
</tr>
<tr>
<td>2004</td>
<td>McKay</td>
<td>1. Simple&lt;br&gt;2. Complex, fistulas involving other organs: urethra, ureter, uterus, rectum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Goh</td>
<td>Type 1: Distal edge of fistula &gt; 3.5 cm from external urinary meatus&lt;br&gt;Type 2: Distal edge of fistula 2.5-3.5 cm from external urinary meatus&lt;br&gt;Type 3: Distal edge of fistula 1.5-&lt;2.5 cm from external urinary meatus&lt;br&gt;Type 4: Distal edge of fistula &lt; 1.5 cm from external urinary meatus&lt;br&gt;(a) Size &lt; 1.5 cm, in the largest diameter&lt;br&gt;(b) Size 1.5-3 cm, in the largest diameter&lt;br&gt;(c) Size &gt; 3 cm, in the largest diameter&lt;br&gt;i. None or only mild fibrosis (around fistula and/or vagina) and/or vaginal length &gt; 6 cm, normal capacity&lt;br&gt;ii. Moderate or severe fibrosis (around fistula and/or vagina) and/or reduced vaginal length and/or capacity&lt;br&gt;iii. Special consideration e.g. postradiation, ureteric involvement, circumferential fistula, previous repair</td>
</tr>
<tr>
<td>2005</td>
<td>Chapple</td>
<td>1. Simple – the healing quality of the tissue margins are virtually normal and these can be resolved by simple, meticulously sutured, layer closure.&lt;br&gt;2. Complex – recurrent fistulas, fistulas with extensive tissue loss, developmental deficiencies, impaired healing potential of its margins, all fistulas that involve the sphincter mechanism, post-obstetric and urethra-vaginal.</td>
</tr>
</tbody>
</table>
## Classification systems for RVF

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Classification</th>
</tr>
</thead>
</table>
| 1980 | Rosenshein | I-loss of perineal body not associated with an identifiable fistulous tract  
II-loss of perineal body associated with a fistulous tract involving the lower third of the vagina  
III-fistulas involving the lower third of the vagina with an intact or attenuated perineal body  
IV-fistulas involving the middle third of the vagina  
V-fistulas involving the upper part of the vagina |
| 2004 | Goh | Type 1: Distal edge of fistula > 3.5 cm from hymen  
Type 2: Distal edge of fistula > 3.5 cm from hymen  
Type 3: Distal edge of fistula > 3.5 cm from hymen  
Type 4: Distal edge of fistula > 3.5 cm from hymen  
(a) Size < 1.5 cm, in the largest diameter  
(b) Size 1.5-3 cm, in the largest diameter  
(c) Size > 3 cm, in the largest diameter  
i. No or mild fibrosis around fistula and/or vagina  
ii. Moderate or severe fibrosis  
iii. Special consideration e.g. postradiation, previous repair. |

## Classification

- **Comparative assessment of the published fistula literature is currently impossible**
  
- No accepted standardized method  
- Previously based on type, size and site  
- No definition of terminology used
Classification Issues

- Size (length and width)
- Location
- Degree of vaginal scarring
- Number of fistulas
- Attachment to pelvic wall
- Condition of urethral sphincter
- Location of ureteral orifices
- Complicating factors: RVF, inflammation

VVF Type

- Simple
- Complex
- Complicated
Simple VVF Characteristics

- Single opening
- Less than 2 cm
- Minimal scarring
- Vagina > 6 cm

Complex VVF Characteristics

- Multiple openings
- 2 - 4 cm in size
- Failed previous repair
- Moderate scarring; scarred trigone, UVJ
- Vagina <4 cm
- Partially absent urethra
- Vesicocervical (uterine)
**Complicated VVF Characteristics**

- Over 4 cm in size
- Short vagina (<4 cm)
- Absent urethra
- Reduced bladder capacity
- Ureteral involvement
- RVF
- Severe scarring

**VVF Site**

- Urethral
- Trigonal
- Supratrigonal
- Urethrotrigonal
**VVF Classification**

- Type I - Simple
- Type II - Complex
- Type III - Complicated

A - Urethral
B - Trigonal
C - Supratrigonal
D - Urethrotrigonal

- 1, 2, 3... # repair attempts

**Conclusions**

- Urgent need for prevention
- Urgent need for standard classification
- Need for management protocols
- Need for training
- Need for research
Unresolved Issues
-Topics for Discussion-

- Simple fistulas
- Complex fistulas
- Complicated fistulas
- Complications of fistula treatment

Simple Fistulas (I)

- **Role of preventive bladder drainage**
- Preoperative care
- Optimal length of postoperative drainage
- Postop care and recurrence prevention
- Incontinence management
- Long term follow-up of repaired fistulas
Simple Fistulas (II)
- Optimal low-tech repair & training
- Criteria for referral
- When to use graft
- When to use an abdominal route
- Newer techniques
- Long term true success
- Fate of subsequent pregnancy

Complex Fistulas (I)
- Frequency and incidence of associated injuries
- Frequency of upper tract abnormalities
- Role of ureteral catheterization
- Optimal grafting
- When to sling concomitantly
Complex Fistulas (II)

- When to augment bladder or substitute
- When to augment vagina and how
- When to combine approaches
- How many repeats
- **When to consider diversion**
- Urethral reconstruction
- Complete urethral loss

Complicated Fistulas (I)

- What diagnostic studies
- **When primary diversion and which**
- Optimal approach to RVF
- Role of augmentation graft
- Assessment of defecatory dysfunction
- Associated injuries
Complicated Fistulas (II)

- Where to carry out complex procedures
- **Optimal follow-up of diverted patients**
- Long term studies on sexual function
- Optimal skin care
- Children issues

Complications of Repair (I)

- **Vaginal Atresia**
  - Optimal approach, vaginal, abdominal
  - Optimal material
  - Long term results
  - Functional results

- **Urinary Diversion**
  - Long term follow-up
  - Optimal follow-up
  - Morbidity and mortality
  - Optimal reimplantation
  - Mobile vs. Fixed units
Complications of Repair (II)

- Urinary Incontinence
  - Incidence of neurologic dysfunction
  - Incidence of contracted bladder
  - Optimal sphincter repair and timing
  - When and what sling
  - When and what augmentation
    - Criteria
    - Follow-up
    - Material

A Call to Action

- Training
- Research
- Specialized centers
- Early intervention
- Prevention
I am old, and need to remember. You are young, and need to learn.

If I forget the words, will you remember the music?

- Ashanti proverb

Thank You!