Surgical Management on Fecal Incontinence

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Definition

• Involuntary loss of sphincter control
• Inability to defer the call to defecate to a socially acceptable time and palace, resulting in untoward release of gas, liquid or solid stool.
Incidence

Population base study
• Under reporting
• Incidence: 2-5%
• Sex ratio: F (60%)>> M
• Age

Pelvic Floor and Anal Sphincter
Continence physiology

- Sphincter mechanism
- Sensation and reflex
- Rectal capacity / compliance
- Colonic motility
- Stool consistency
Analogy

- Upstream flow – Colonic motility
- Reservoir – Rectal compliance
- Dam – Sphincter mechanism
- Flood gate control – Sensation & reflex
Flooding

Physiology

• Sphincter mechanism
  – Levator ani
  – Puborectalis
  – Anorectal angle
  – Anal sphincter
  – Anal cushion
Pelvic floor

**Physiology**

- **Sensation and reflex**
  - Rectal sensation
    - Sensation of rectal distension
    - Sensation of urge
  - Anal sensation
    - Ano-transitional zone (ATZ)
  - Recto-anal inhibitory reflex
    - Sampling reflex
Motility - Peristalsis

Peristaltic rush
Physiology

- Rectal capacity / compliance
  - Ability to hold feces
  - Distensibility of the rectum

Etiology

- Abnormal colonic transit
- Abnormal stool consistency
- Abnormal rectal compliance
- Abnormal sphincter
- Abnormal pelvic floor
- Abnormal neurology
Clinical Classifications

• Normal pelvic floor

• Abnormal pelvic floor

• Secondary incontinence

• Abnormal colonic transit

• Abnormal pelvic floor
  – Abnormal sphincter
  – Abnormal neurology

• Secondary Incontinence
  – Overflow incontinence /Spurious diarrhoea
Normal Pelvic Floor

– Diarrheal state
  • Infective diarrhoea
  • Laxative abuse
  • Inflammatory bowel disease

– Systemic disease
  • CVA
  • Neuropathy (DM)
  • Dementia
  • Spinal cord lesion

Abnormal Pelvic Floor

– Sphincter injury / Pelvic floor damage
  • Vaginal delivery
  • Obstetrics injury
  • Anorectal surgery
  • Pelvic injury

– Pelvic floor denervation
  • Prolonged labour
  • Chronic straining
  • Rectal prolapse
Overflow Incontinence

• Outlet obstruction / fecal impaction
  – Anatomical
    • Strictures
    • Stenosis
  – Functional
    • Inadequate fibres
    • Metabolic abnormality
    • Abnormal mental state
    • Medication

Clinical Management

• Ascertain of diagnosis
• Rule out secondary causes
  • Assessment of severity
  • Assessment of progress and response to treatment
What to look for

- Odour
- Use of pad
- Soiling of pants
- Excoriation
- Scars
- Fistula openings

What to examine

- Anus
- Ano-vaginal septum
- Perineal body
- Rectum

- Anal pressure
  - Resting
  - Squeeze
Associated Disease

• Uterine prolapse
• Rectal prolapse
• Urinary incontinence

Not incontinence

• Perineal soiling
  – Haemorrhoid prolapse
  – Rectal mucosal prolapse
  – Fistula in ano
  – Perianal dermatological disease

• Urgency
Incontinence Management

General Investigations

• Exclude secondary causes / organic causes
  – Neurological disease
  – Metabolic disease
  – Drugs
  – Endoscopy
Clinical Management

- Ascertained of diagnosis
- Rule out secondary causes
- Assessment of severity

Severity

- Type of incontinence
  - Gas / liquid / solid
- Frequency
  - Episodes / day or episodes / week
- Amount
- Activities of daily living affected
Severity

Assessment score
• Severity index
  – Williams score
  – Wexner Score

• Quality of Life
  – SF-36
  – Fecal Incontinence Quality of Life Scale (FIQL)

Williams’ score

1 – continence to solids, liquids and flatus
2 – continent to solids and liquids but no flatus
3 – continent to solids but occasional episodes of liquid incontinence
4 – occasional episodes of incontinence of solids, and frequent episodes of incontinence to liquids
5 – frequent episodes of incontinence of solids and liquids
**Wexner Incontinence Score**

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>&lt; 1/month</th>
<th>&lt;1/week-1/month</th>
<th>&lt;1/day -1/week</th>
<th>Daily</th>
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<tbody>
<tr>
<td>Flatus</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Liquid</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Solid</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Use of Pad</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Alteration in life style</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>

0 – perfect continence, 20 – severe incontinence

**Clinical Management**

- Ascertain of diagnosis
- Rule out secondary causes
- Assessment of severity
- **Identify type of incontinence**
Specific Investigation

- Anorectal Physiology
- Defecography - Dynamics
- Endoanal Ultrasonography

Constipation Management

- Incontinence
  - Physician Assessment
    - Secondary Incontinence
  - Normal Pelvic Floor
  - Abnormal Pelvic Floor
Incontinence Management

Incontinence

- Physician Assessment
  
  - Secondary Incontinence
    
    - Incontinence
      
      - Normal Pelvic Floor
        
        - Abnormal Transit
      
      - Abnormal Pelvic Floor
        
        - Abnormal Sphincter
        
        - Abnormal Neurology

Investigations

Pelvic floor function
  
  - Manometry

Pelvic floor structural integrity
  
  - Endoanal ultrasonography

Pelvic floor neural integrity
  
  - Pudendal Nerve Terminal Motor Latency
Anorectal physiology

• Functional evaluation of the anorectum, pelvic floor and the anal sphincter

• Parameters:
  – Pressure (Manometry)
  – Volumes
  – Compliances
  – Reflex, Electromyography (RAIF, EMG, PNTML)
  – Dynamics (Defecography)

Manometry
Manometry

• Sphincter length

• Sphincter pressure
  – Resting pressure
  – Squeeze pressure

• Rectal volumes / compliance

Resting & Squeeze Pressure
Endoanal Ultrasonography

- Anatomical examination of the sphincter muscle
  - Sphincter disruption
  - Scar
Normal Sphincter

Electromyography

• Pudendal Nerve Terminal Motor Latency (PNTML)

• Integrity of the pelvic floor neuromusculature
St. Marks Electrode

Pudendal Nerve Terminal Motor Latency

Normal <2.4ms
Pathophysiological Classification

<table>
<thead>
<tr>
<th>Abnormal Pelvic Floor</th>
<th>Anorectal Physiology Test</th>
<th>Traumatic Fecal Incontinence</th>
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<tbody>
<tr>
<td>Abnormal Pelvic Floor</td>
<td>Neuropathy</td>
<td>Neuropathic Fecal Incontinence</td>
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<tr>
<td>Abnormal Pelvic Floor</td>
<td>Sphincter Defect Neuropathy</td>
<td>Combined Fecal Incontinence</td>
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<td>Normal Pelvic Floor</td>
<td>Normal Sphincter No Neuropathy</td>
<td>Idiopathic Fecal Incontinence</td>
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</tbody>
</table>

Idiopathic Fecal Incontinence

Incontinence

Endoanal USG
- Normal
- Abnormal

PNTML
- Normal
- Abnormal

Normal Pelvic Floor
- Abnormal Pelvic Floor
  - Abnormal Sphincter

Abnormal Pelvic Floor
- Abnormal Sphincter
- Abnormal Neurology
Traumatic Fecal Incontinence

- Incontinence
  - Endoanal USG
    - Normal
    - Abnormal
  - PNTML
    - Normal
    - Abnormal

- Normal Pelvic Floor
- Abnormal Pelvic Floor
  - Abnormal Sphincter
  - Abnormal Neurology

Sphincter Defect
Neuropathic Fecal Incontinence

- **Incontinence**
  - **Endoanal USG**
    - Normal
    - Abnormal
  - **PNTML**
    - Normal
    - Abnormal

- **Normal Pelvic Floor**
- **Abnormal Pelvic Floor**
  - Abnormal Sphincter
  - Abnormal Neurology

Prolonge Right PNTML
Combined Fecal Incontinence

Incontinence

- Endoanal USG
  - Normal
  - Abnormal

- PNTML
  - Normal
  - Abnormal

- Normal Pelvic Floor
- Abnormal Pelvic Floor
  - Abnormal Sphincter
  - Abnormal Neurology

Treatment

- Non-operative
- Operative
- Multi-disciplinary
  - Dietitian
  - Physiotherapist
  - Nursing
  - Physician
Non Operative Treatment

- Identification of exacerbating factors
- Perineal management
- Medications
- Physiotherapy

Diet

- Food
  - Caffeine
  - Alcohol
  - Dairy products
  - Artificial sweetener
  - Spicy food
- Dietary fibres
- Fluid intake
Perineal management

• Keep clean
• Keep dry
• Skin barrier
• Management of complications

Medication

• Stool bulking agent / Stool softening

• Anti-diarrheal
  – Loperamide (dec transit, inc fluid reabsorption, reducing secretion)
  – Diphenoxylate [Lomotil]
Physiotherapy

• Bio-feedback
  – Improves 50-60% of patients

• Electrical stimulation

Biofeedback

Manometric    EMG
Operative principles

• Repair
• Reinforce
• Replace
• Re-innervate
• Re-route

Repair

• Anal sphincter injury – overlapping repair
• Pelvic floor weakness – pelvic floor repair
Sphincter Repair

Direct Repair

Overlapping Repair

• Improves continence score in 60%
• Long term results doubtful
Pelvic Floor Repair

• Restore anorectal angle
• Associate procedure for rectal prolapse

Reinforce

• Muscle transposition
  – Gluteus muscle transposition
  – Gracilllis muscle transposition

• Stimulated Gracilllis muscle sling

• Injectable Bulking Agent
Stimulated Gracilis Muscle Sling

Injectable Bulking Agents

- Facilitate closure of anal canal
- No change in anal canal pressure

- Submucosal injection
  - Silicone
  - Carbon-coated zirconium oxide beads
  - Biological tissues
Replace

- Artificial anal sphincter - neosphincter

- High rate of device related complications (85%)
- Evacuation difficulty
- Pain
- Device removal – 50%
Re-innervations

Sacral Nerve Stimulation
Sacral Nerve Stimulation

- Neuromodulation on anal sphincter and rectum
- 75% improves
- 40% complete continence
- Minimally invasive, minimal complications

Re-route

- Stoma
Conclusions

• Multiple etiology
• Specific investigations
• Multi-disciplinary approach to treatment