Complications of Sling and Prolapse Surgery – Evaluation and Management

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Complications of Stress Incontinence Surgery (Slings): (Excluding Voiding Issues)

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Complications of Vaginal Sling Surgery

- Bleeding
- Infection
- Bladder injury/Perforation
- Bladder outlet obstruction
- Urethral injury
- Neurologic injury/pain
- Mesh related
  - Extrusions into vagina
  - Mesh erosions into urethra
  - Mesh erosions into bladder
Bleeding During Sling Surgery

• Retropubic passage:
  – entry into retropubic space
    • Sling placement/close observation
    • Foley catheter into bladder, 60cc in balloon and compression
  – Trochar passage
    • Point cautery
    • Usually due to close passage near urethra/periurethral neurovascular compartments
  – Retropubic TVT passage (recognition of injury is key)
    • Exploration (retropubically/open): not transvaginally
Bleeding in Slings

• May occur 0.5 to 8% of time
• No difference between Burch BNS and fascial slings based on SisteR trial (2009)
• TOT lower likelihood of bleeding and transfusion rates overall less than 1%
Obturator Anatomy
Vasculature

**Distances**
- Medial branch vessel 3.1 cm (2.3-4.8 cm)
- Lateral branch vessel 4.3 cm (3.0-5.3 cm)

*Device to most medial vessel 1.1 cm*
- Device to canal 2.3 cm
Bleeding into Obturator Space

• Very little data
  – Most bleeding will stop with some pressure and placement of sling/compression
  – Foley balloon and inflate with 60 cc sterile water
• What is the utility (if any) of a vaginal pack?
• case reports
• Compartment syndrome potential
• Use of angiography and embolization?
Bleeding during Retropubic Space entry

• Entry into retropubic space
  – Preservation of endopelvic fascia
• Enter just lateral to periurethral fascia
• Medial to levator fascia and musculature
• Oblique angle 30 degrees from midline towards ipsilateral shoulder
Infections

• Sling related infections (with new type 1 meshes are extremely uncommon)
  – Obtape
  – ProteGen

• Urinary tract infections can occur within the first month after sling surgery
  – Discharge
  – Slowing of urine stream
  – Catheters etc..
Perioperative Urinary Tract infections

• Post-sling UTI incidence varies from 8-33% (Anger, Laurikainen)
  – Studies not designed to look at this problem
  – Loss to follow-up
  – Lack of standardized perioperative management
  – Perioperative antibiotic protocols often not standardized
  – Diagnostic methods not clear

• Skin and vaginal infections are rare (Laurikainen)

• Overall infection after sling is 5.5 % (Paraiso)

• Single dose may be as effective as 24 hr or more, less antibiotic related AE’s (Swartz et al, Urology 2009)

• Used more commonly as a metric in *Outcomes*
Ob Tape Complications/Infection?

Courtesy of Howard B. Goldman, MD
Infections/ Abscess

66 y/o female s/p TOT sling, fever, pain in thigh, fluctuance, no palp mass

Courtesy of Howard B. Goldman, MD
Bladder Injury/Perforation

- Not uncommon
- Most series of retropubic slings show rates of 0-24%
- TOT slings too
- 6x less TOT
- Recognized?
- Cystoscopy
  — SUI guidelines
TVT Complications
Bladder perforation

- Proper recognition of entry
  - Fluid emanating from space (urine)
  - Irrigation of foley (+/- Indigo Carmine)
  - Cystoscopy
- Suture passage (no further therapy)
- Multilayer closure +/- Martius flap
- No overlapping suture lines
- Good urinary drainage x 5 - 7 days
  - Cystogram to confirm healed bladder wall
LIGHT TEST FOR CYSTOCOELE

Vasavada, Comiter, Raz, Urol 1999
Urethral Injury

- Overall low incidence (< 1%)
- Again, essential to recognize injury
  - Careful cystourethroscopy
  - Reposition needle/trochars
  - Large injury: probably best to abort surgery (mesh)
    - Primary repair
    - Martius flap ??
- TOT incidence is extremely low but higher with outside in than inside out (BJU int 2010)
Bowel Injury

• Recognition is again key
• Fatal reports (several)
  – MAUDE database
  – Some from expert TVT implanters
  – Can occur in antegrade slings too (Kobashi et al, 2005)
• Prior abdomino-pelvic surgery
  – Should this contraindicate a tvt sling?
Neurologic Injury/Pain

• Trochar passage retropubically (ilioinguinal nerve branches) esp if too lateral
• TOT sling passage can injure groin nerves (higher incidence in less obese patients)
  – Runners
  – Athletic patients
  – Considerations for consent
• TOT (outside in vs inside out): at least transiently, inside out seems to have more pain/neurologic potential abn
• Positioning.... Especially if longer case (prolapse etc..)
Neurologic injury

- Entrapment of ilioinguinal nerve branches just lateral to pubic symphysis
- Obturator branches in groin
  - Mesh arms
- Sacrospinous ligament fixation
- Patient positioning:
  - Gentle positioning
  - Avoidance of excessive pressure and tension

*Rovner et al. 1999*
Neurologic Injury: Positioning Mechanism of Injury
Mechanism of injury
Nerve & Vascular Injury

S. Pubic Ramus

Accessory Obturator Vein

Obturator Nerve

Pubocervical Fascia

TVT Needle

External Iliac Vein
Management of Nerve Injury

- Conservative (NSAIDS), rest, time
- Neural pain medications (neurontin etc)
- Pain injections/steroid injections
- Physical therapy
- Removal of sling material
  - May not help pain
  - May elicit more trauma
Mesh Related Complications of Vaginal Sling Surgery

• Extrusion (vaginal exposure)
• Perforation (into urinary tract)
  – Urethra
  – Bladder
• Optimal management
Recent Update from US-FDA

• In particular, the literature review revealed that: Mesh used in transvaginal POP repair introduces risks not present in traditional non-mesh surgery for POP repair.

• Mesh placed abdominally for POP repair appears to result in lower rates of mesh complications compared to transvaginal POP surgery with mesh.

• There is no evidence that transvaginal repair to support the top of the vagina (apical repair) or the back wall of the vagina (posterior repair) with mesh provides any added benefit compared to traditional surgery without mesh.

• While transvaginal surgical repair to correct weakened tissue between the bladder and vagina (anterior repair) with mesh augmentation may provide an anatomic benefit compared to traditional POP repair without mesh, this anatomic benefit may not result in better symptomatic results.
Proportion of Patients with Treatment Failure at 2 Years, According to Overall Composite Criteria, Composite Criteria Specific to Stress Incontinence, and Other Criteria

Burch vs Autologous Fascia Sling

### Table 2. Adverse Events.

<table>
<thead>
<tr>
<th>Event</th>
<th>Burch Procedure (N=329)</th>
<th>Sling Procedure (N=326)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Serious adverse events‡</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients with event</td>
<td>32 (10)</td>
<td>42 (13)</td>
<td>0.20</td>
</tr>
<tr>
<td>Total events</td>
<td>39</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ureteral injury</td>
<td>2</td>
<td>0</td>
<td>0.12</td>
</tr>
<tr>
<td>Ureterovaginal fistula</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Incidental vaginotomy</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Incidental cystotomy</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Erosion of suture into bladder</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Recurrent cystitis, leading to diagnostic cystoscopy</td>
<td>5</td>
<td>6</td>
<td>0.83</td>
</tr>
<tr>
<td>Pyelonephritis</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Catheter complication</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Voiding dysfunction leading to surgical revision</td>
<td>0</td>
<td>20</td>
<td>0.25</td>
</tr>
<tr>
<td>Pelvic pain</td>
<td>0</td>
<td>2</td>
<td>0.25</td>
</tr>
<tr>
<td>Bleeding</td>
<td>3</td>
<td>1</td>
<td>0.62</td>
</tr>
<tr>
<td><strong>Wound complication requiring surgical intervention</strong></td>
<td>13</td>
<td>11</td>
<td>0.83</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory distress requiring intubation</td>
<td>0</td>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td>Laryngospasm requiring reintubation</td>
<td>0</td>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>Adverse events¶</strong></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Patients with event</td>
<td>156 (47)</td>
<td>206 (63)</td>
<td></td>
</tr>
<tr>
<td>Total events</td>
<td>305</td>
<td>415</td>
<td></td>
</tr>
<tr>
<td>Genitourinary</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cystitis</td>
<td>203</td>
<td>305</td>
<td></td>
</tr>
<tr>
<td>Pyelonephritis</td>
<td>202</td>
<td>299</td>
<td></td>
</tr>
<tr>
<td>Vascular or hematologic</td>
<td>1</td>
<td>6</td>
<td>0.29</td>
</tr>
<tr>
<td>Deep-vein thrombosis</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Wound complication not requiring surgical intervention</strong></td>
<td>69</td>
<td>71</td>
<td>0.69</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>7</td>
<td>8</td>
<td>0.80</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>10</td>
<td>9</td>
<td>1.00</td>
</tr>
<tr>
<td>Neurologic</td>
<td>6</td>
<td>5</td>
<td>1.00</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>0</td>
<td>2</td>
<td>0.25</td>
</tr>
<tr>
<td>Allergic (hives, itching)</td>
<td>0</td>
<td>2</td>
<td>0.25</td>
</tr>
<tr>
<td>Constitutional</td>
<td>3</td>
<td>0</td>
<td>0.25</td>
</tr>
<tr>
<td>Dermatologic (rash, erythema)</td>
<td>2</td>
<td>4</td>
<td>0.45</td>
</tr>
</tbody>
</table>
5-Year Continence Rates, Satisfaction and Adverse Events of Burch Urethropexy and Fascial Sling Surgery for Urinary Incontinence

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E. Ann Gormley † † for the Urinary Incontinence Treatment Network

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** Abbreviations and Acronyms

LIQ = Incontinence Impact Questionnaire
SUI = stress urinary incontinence
UDI = Urogenital Distress Inventory
UI = urinary incontinence
UUI = urinary urgency incontinence

** Purpose:** We characterized continence, satisfaction and adverse events in women at least 5 years after Burch urethropexy or fascial sling with longitudinal followup of randomized clinical trial participants.

**Materials and Methods:** Of 655 women who participated in a randomized surgical trial comparing the efficacy of the Burch and sling treatments 482 (73.6%) enrolled in this long-term observational study. Urinary continence status was assessed yearly for a minimum of 5 years postoperatively. Continence was defined as no urinary leakage on a 3-day voiding diary, and no self-reported stress incontinence symptoms and no stress incontinence surgical re-treatment.
Figure 3.
Proportion of patients reporting continence at 5 years by composite criteria and individual outcome components
Note: Other therapy includes medical, device, behavior, and other.
# Staging of Complications

## Category, Time, Site (CTS) Classification

**Table 2: A CLASSIFICATION OF COMPLICATIONS RELATED DIRECTLY TO THE INSERTION OF PROSTHESES (MESHES, IMPLANTS, TAPES) OR GRAFTS IN FEMALE PELVIC FLOOR SURGERY**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>A (Asymptomatic)</th>
<th>B (Symptomatic)</th>
<th>C (Infection)</th>
<th>D (Abscess)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Vaginal: no epithelial separation Include prominence (e.g. due to wrinkling or folding), mesh fibre palpation or contraction (shrinkage)</td>
<td>1A: Abnormal prosthesis or graft finding on clinical examination</td>
<td>1B: Symptomatic e.g. unusual discomfort / pain; dyspareunia (either partner); bleeding</td>
<td>1C: Infection (suspected or actual)</td>
<td>1D = Abscess</td>
</tr>
<tr>
<td>2 Vaginal: smaller ≤ 1cm exposure</td>
<td>2A: Asymptomatic</td>
<td>2B: Symptomatic</td>
<td>2C: Infection</td>
<td>2D = Abscess</td>
</tr>
<tr>
<td>3 Vaginal: larger &gt;1cm exposure, or any extrusion</td>
<td>3A: Asymptomatic 1-3Aa if no prosthesis or graft related pain</td>
<td>3B: Symptomatic 1-3B (b-e) if prosthesis or graft related pain</td>
<td>3C: Infection 1-3C 1/3D (b-e) if prosthesis or graft related pain</td>
<td>3D = Abscess</td>
</tr>
<tr>
<td>4 Urinary Tract: compromise or perforation Including prosthesis (graft) perforation, fistula and calculus</td>
<td>4A: Small intraoperative defect e.g. bladder perforation</td>
<td>4B: Other lower urinary tract complication or urinary retention</td>
<td>4C: Ureteric or upper urinary tract complication</td>
<td>4D = Abscess</td>
</tr>
<tr>
<td>5 Rectal or Bowel: compromise or perforation Including prosthesis (graft) perforation and fistula</td>
<td>5A: Small intraoperative defect (rectal or bowel)</td>
<td>5B: Rectal injury or compromise</td>
<td>5C: Small or Large bowel injury or compromise</td>
<td>5D = Abscess</td>
</tr>
<tr>
<td>6 Skin and / or musculoskeletal: complications including discharge pain lump or sinus tract formation</td>
<td>6A: Asymptomatic, abnormal finding on clinical examination</td>
<td>6B: Symptomatic e.g. discharge, pain or lump</td>
<td>6C: Infection e.g. sinus tract formation</td>
<td>6D = Abscess</td>
</tr>
<tr>
<td>7 Patient: compromise including hematoma or systemic compromise</td>
<td>7A: Bleeding complication including haematoma</td>
<td>7B: Major degree of resuscitation or intensive care*</td>
<td>7C: Mortality*</td>
<td>7D = Abscess</td>
</tr>
</tbody>
</table>

**TIME (clinically diagnosed)**

<table>
<thead>
<tr>
<th>T1: Intraoperative to 48 hours</th>
<th>T2: 48 hours to 2 months</th>
<th>T3: 2 months to 12 months</th>
<th>T4: over 12 months</th>
</tr>
</thead>
</table>

**SITE**

<table>
<thead>
<tr>
<th>S1: Vaginal: area of suture line</th>
<th>S2: Vaginal: away from area of suture line</th>
<th>S3: Trocar passage Exception: Intra-abdominal (S5)</th>
<th>S4: other skin or musculoskeletal site</th>
<th>S5: Intra-abdominal</th>
</tr>
</thead>
</table>

**N.B.**

1. Multiple complications may occur in the same patient. There may be early and late complications in the same patient. i.e. All complications to be listed. Tables of complications may often be procedure specific.
2. The highest final category for any single complication should be used if there is a change over time. (patient 888)
3. Urinary tract infections and functional issues (apart from 4B) have not been included.

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**IUGA**

**ICS**
Mesh Complication Presentation

• Extrusion
  – Vaginal discharge
  – Pain
  – Dyspareunia

• Perforation
  – Pain
  – Urinary tract infections
  – Overactive bladder and irritative LUTS
  – Obstructive voiding symptoms
  – hematuria
Mesh Exposure from Slings

• Data shows incidence of less than 2% (Abdel-Fattah et al, BJU Int, 2006)
• Most were in ObTape patients
• Etiology
  – Thin flap dissection
  – Vaginal atrophy
  – Breakdown of incision lines
Mesh Extrusion

• Management options
  – Vaginal estrogens (limited confirmational data)
  – Flap coverage (small series of good results)
    • Consent for possible need for repeat management
  – Mesh excision and closure of vaginal walls
    • Risk of recurrent SUI
Mesh Extrusion “Button-Hole”

- Reported series are mostly in TOT sling patients
- High lateral sulcus
- May elicit pain
Managing Mesh Complications

• Resolution of mesh exposure may be done with antibiotics and estrogen cream

• Treat in office when mesh exposure is:
  – Easy to reach and near the introitus
  – Small and requires minimal excision

• Treat in OR if mesh exposure is:
  – Large and requires reapproximation of mucosa
Vaginal Erosions of Mesh are Increasing in Incidence as the Use of Mesh Increases

Erosions can be found after:

- Slings
- Abdominal sacral colpopexy (open or laparoscopic)
- Cystocele and rectocele repairs
- Tunneller procedures for vaginal apex prolapse
Diagnosis of Mesh Perforation

• History:
  – Pain
  – Urinary tract infections
  – Overactive bladder and irritative LUTS
  – Obstructive voiding symptoms
  – hematuria

• Physical exam (tenderness suburethrally ?)

• Cystoscopy (flexible) bias

• Ultrasonography: transvaginal/labial

• Urodynamics ? Is patient obstructed ?
Mini-Sling Complications

Presenting Complaints:
- pain
- dyspareunia
- UTI
- obstruction
- erosion
- extrusion

76% had >1 complaint
Adjustable (Remeex) Complications

Table 4. Complications classified according to the modified Clavien system.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Complication</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>De novo urgency</td>
<td>15</td>
<td>14.7</td>
</tr>
<tr>
<td></td>
<td>Suprapubic pain</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Bladder perforation</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Acute urinary retention</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Hematoma</td>
<td>2</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Suprapubic discomfort</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>De novo dyspareunia</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>II</td>
<td>Wound infection</td>
<td>4</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Urinary tract infection</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Persistent suprapubic pain</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>IIIa</td>
<td>Recurrent stress urinary incontinence</td>
<td>13</td>
<td>12.7</td>
</tr>
<tr>
<td></td>
<td>Urinary retention</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>IIIb</td>
<td>Infection, sling removed</td>
<td>2</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Park, et al Urology 2015
Urethral Perforation/Erosion

- Presenting symptoms may dictate best treatment option
  - Elderly patient
  - Minimal symptoms
  - Hematuria
  - No irritative or obstructive symptoms
Erosion into Urethra

• Should be noted on preop cystoscopy
• Can be managed with endoscopic rx (not scissors, TUR or Bugbee but rather Holmium laser)
• Follow up cysto to assure no remaining edges
Perforations/Erosions into Bladder

- Optimal management again depends on patient symptoms
  - Endoscopic (holmium laser)
  - Transvesical (definitive)
    - Single port (Cleveland Clinic experience)
    - Open (allows excision of all portions of mesh)
  - Transvaginal (if posterior).... Fistula potential
Mesh entering at the 11 o'clock position with minimal stone formation (A), and the continuation of the mesh traversing the urethra with increasing stone formation (B). Fig. 1. Solomon and Jelovsek. Technique to Remove a Misplaced Midurethral Sling. Obstet Gynecol 2015.
Nasal speculum (A), Blakesley graspers (B), curved ethmoid scissors (C), and curved ethmoid scissors (D).

Fig. 2. Solomon and Jelovsek. Technique to Remove a Misplaced Midurethral Sling. Obstet Gynecol 2015.
The urethra directly after the mesh was excised (A), and the urethra 3 months after surgery (B). Fig. 3. Solomon and Jelovsek. Technique to Remove a Misplaced Midurethral Sling. Obstet Gynecol 2015.
Endoscopic Management

Case Report

Repeated Endoscopic Excision of an Eroding Calcified Mesh Sling—Continued Follow-Up Is Required

Tsia-Shu Lo, MD*, and Zalina Nusee, MD

From the Division of Urogynecology, Department of Obstetrics and Gynecology, Chang Gung Memorial Hospital, Chang Gung University, School of Medicine, Taoyuan, Taiwan, Republic of China (Dr. Lo), and the Department of Obstetrics & Gynaecology, Kulliyyah of Medicine, International Islamic University, Jalan Hospital Campus, Kuantan, Pahang, Malaysia (Dr. Nusee).

ABSTRACT

The tension-free vaginal tape (TVT) procedure is the most popular worldwide for treating stress urinary incontinence. Intravesical mesh erosion related to the use of the TVT sling is rare. We report a rare case of mesh erosion over the bladder dome, with stone formation developing 11 years after TVT surgery. The diagnosis was made by cystoscopic examination after a 5-month history of lower urinary tract symptoms. Cystoscopic cystolithotomy was performed. No obvious mesh material was seen except for a small filament that was excised cystoscopically. Repeat cystoscopic follow-up was performed a year later. A recurrent stone formation resulted from a nonvisible mesh filament. Repeat cystoscopic cystolithotomy was performed, and the patient refused further surgical intervention. In women with a history of undergoing the TVT procedure and who have persistent lower urinary tract symptoms, a cystoscopic examination is mandatory to avoid delay in diagnosis and under-reporting of sling-related complications. Despite satisfactory cystoscopic management, long-term regular follow-up is still required. Journal of Minimally Invasive Gynecology (2010) 17, 383–385 © 2010 AAGL. All rights reserved.

Keywords: Complication; Mesh; TVT
Conclusions

• Mesh use for slings is likely here to stay...
• Consent process is an interaction between physician and patient
• Surgical principles in exposure (flaps) and closure are important considerations
• Complications can and will occur
• Recognition is key
• If postoperative recognition, complete removal (exposed and then some margin.. Will be necessary in most patients)
Urinary Retention and Voiding Dysfunction after Incontinence Surgery

Kamran P Sajadi, MD
Assistant Professor
OHSU Urology
• **True incidence unclear**

  – Literature estimates 5 – 21%

  – Varies by procedure, era

- MUS 2 – 4%
- PVS 4 – 10%
- Burch 4 – 22%
- Needle Suspension 5 – 7%
- MMK 5 – 20%

Etiology

• Obstruction / Incomplete Emptying
  – Excessive tension
    • Tight sling
    • Hyperangulated suspension
  – Misplaced sutures or sling
  – Cystocele
  – Impaired detrusor contractility
  – Dysfunctional voiding
Presentation

• Urinary Retention
  — Acute
    • Failed voiding trials, needing CIC
  — Chronic / Incomplete Bladder Emptying
    • Recurrent UTIs
Presentation

- **Voiding Symptoms**
  - Positional voiding
  - Straining, Intermittency
  - Weak stream
  - Dysuria

- **Storage Symptoms**
  - Urgency/Frequency
  - Urgency Incontinence
Evaluating for Bladder Outlet Obstruction

- **History and Symptoms**
- **Urinalysis and PVR**
  - Elevated PVR raises suspicion
  - Normal PVR does NOT rule out obstruction
- **Exam**
  - Recurrent/Exacerbated prolapse
  - Urethral angle
  - High-tone pelvic floor dysfunx

Evaluating for Bladder Outlet Obstruction

• **Cystoscopy**
  - Degree of angle
  - Foreign body
  - May be done in OR if loosening anyway

• **Urodynamics**
  - Often not necessary
  - Equivocal cases, disprove if low suspicion
• Endoscopy Evaluation
Utility of Urodynamics

• **Retention**
  – Can confirm obstruction, may not rule out
  – Learned voiding dysfunction

• **LUTS without Retention**
  – May rule out obstruction
  – May identify other causes of symptoms
Utility of Urodynamics

- **Webster & Kreder, 1990**
  - “Urodynamics may fail to diagnose obstruction”

- **Foster & McGuire, 1993**
  - No urodynamic parameter predicted success

- **Nitti & Raz, 1994**
  - \( P_{\text{det}} \) & \( Q_{\text{max}} \) neither predictive of outcome
  - All “acontractile” patients successful
Transvaginal Sling Incision

  - Multicenter, 600 patients
  - 17 (2.8%) with retention
    - Time from sling mean 64 (6 – 228) days
  - All retention resolved
  - 1 urethral injury
  - Recurrent SUI in 6%
Transvaginal Sling Incision

- **Recurrent SUI**

<table>
<thead>
<tr>
<th></th>
<th># Patients</th>
<th>Recurrent SUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klutke</td>
<td>17</td>
<td>6%</td>
</tr>
<tr>
<td>Gamé</td>
<td>30</td>
<td>8.7%</td>
</tr>
<tr>
<td>South</td>
<td>112</td>
<td>8.9%</td>
</tr>
<tr>
<td>Clifton</td>
<td>93</td>
<td>14%</td>
</tr>
<tr>
<td>Laurikainen</td>
<td>50</td>
<td>51%</td>
</tr>
</tbody>
</table>

Klutke et al, Urology 58:697, 2001
Gamé et al, Prog Urol 171:1629, 2006
Clifton et al, J Urol 191: 710, 2014
Pubovaginal Sling Incision

- Inverted-”U” or midline incision
- Isolate sling in midline
- Incise sling

Goldman HB, Urol Clin N Am 2011
Pubovaginal Sling Incision

• Free sling from underlying tissue
  – Sharp or blunt

• No endopelvic fascia perforation

• Similar to synthetic
  – More exposure needed
  – Slightly more dissection
## Pubovaginal Sling Incision

### Results of Therapy for Bladder Outlet Obstruction after Pubovaginal Sling (PVS) Surgery

<table>
<thead>
<tr>
<th>STUDY</th>
<th>NO. PATIENTS</th>
<th>MANAGEMENT</th>
<th>TIME TO TREATMENT (MEAN)</th>
<th>SUCCESS RATE</th>
<th>RECURRENT SUI</th>
<th>REPEAT SURGERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defreitas and Herschorn, 2000</td>
<td>16</td>
<td>Lateral sling lysis</td>
<td>NA</td>
<td>94%</td>
<td>34%</td>
<td>NA</td>
</tr>
<tr>
<td>Amundsen et al, 2000</td>
<td>32</td>
<td>22 transvaginal urethrolysis</td>
<td>39 wk (5-150)</td>
<td>84% (not stratified by procedure)</td>
<td>12.5%</td>
<td>1 patient received collagen injections</td>
</tr>
<tr>
<td>Kusuda, 2001</td>
<td>5</td>
<td>Sling lysis</td>
<td>6 wk-2 yr</td>
<td>100%</td>
<td>None</td>
<td>NA</td>
</tr>
<tr>
<td>Nitti et al, 2002</td>
<td>19</td>
<td>Sling lysis</td>
<td>10.6 mo (3-72)</td>
<td>84%</td>
<td>17%</td>
<td>2 patients received collagen injections; 1 patient had repeat PVS</td>
</tr>
<tr>
<td>Goldman, 2003</td>
<td>14</td>
<td>Sling lysis</td>
<td>8.6 mo (3-26)</td>
<td>93%</td>
<td>21%</td>
<td>1 patient received polypropylene sling</td>
</tr>
<tr>
<td>Thiel et al, 2005</td>
<td>13 (2 lost to follow-up)</td>
<td>Sling lysis</td>
<td>65 days (36-235)</td>
<td>45% improved; 45% cured</td>
<td>7.7%</td>
<td>No repeat surgery</td>
</tr>
</tbody>
</table>

SUI, stress urinary incontinence.
Urethrolysis

• **Indications**
  
  – Failed biologic sling incision
  
  – Previous retropubic suspension
    
    • Burch
    
    • MMK
    
    • Needle Suspension
  
  – Significant periurethral scar

• **Circumferential freeing of urethra from pubis**
Transvaginal Urethrolysis

- Inverted-"U" incision

- Bilateral dissection

- Perforate endopelvic fascia sharply

- Develop retropubic space bluntly
Transvaginal Urethrolysis

- Sharp and blunt dissection anterior to urethra to free from pubis
- Index finger or penrose drain between pubic bone and urethra
Suprameatal Urethralysis

- Curved incision above urethra

Petrou SP et al, J Urol 161:1268, 1999
Suprameatal Urethrolysis

• Sharply mobilize urethra and bladder neck off pubis
• Incise pubourethral ligaments
• Enter retropubic space
• Clitoral proximity
  – Sexual dysfunction?

Petrou SP et al, J Urol 161:1268, 1999
Retropubic Urethrolysis

- Sharp mobilization of urethra by sharp dissection
  - Bladder neck to urethral meatus
- Paravaginal defect repair
- Flap interposition between urethra and pubis
  - Omentum
  - Peritoneum
Retropubic Urethralysis

Goldman HB, Urol Clin N Am 2011
# Urethrolysis Results

<table>
<thead>
<tr>
<th>Study</th>
<th># Patients</th>
<th>Approach</th>
<th>Success</th>
<th>SUI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster &amp; McGuire</td>
<td>48</td>
<td>Transvaginal</td>
<td>65%</td>
<td>0</td>
</tr>
<tr>
<td>Nitti &amp; Raz</td>
<td>42</td>
<td>Transvaginal</td>
<td>71%</td>
<td>0</td>
</tr>
<tr>
<td>Cross et al</td>
<td>39</td>
<td>Transvaginal</td>
<td>72%</td>
<td>3%</td>
</tr>
<tr>
<td>Goldman et al</td>
<td>32</td>
<td>Transvaginal</td>
<td>84%</td>
<td>19%</td>
</tr>
<tr>
<td>Petrou et al</td>
<td>32</td>
<td>Suprameatal</td>
<td>67%</td>
<td>3%</td>
</tr>
<tr>
<td>Webster &amp; Kreder</td>
<td>15</td>
<td>Retropubic</td>
<td>93%</td>
<td>13%</td>
</tr>
<tr>
<td>Petrou &amp; Young</td>
<td>12</td>
<td>Retropubic</td>
<td>83%</td>
<td>18%</td>
</tr>
<tr>
<td>Carr &amp; Webster</td>
<td>54</td>
<td>Various</td>
<td>78%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Urethrolysis Outcomes

• Increased PVR only urodynamic criteria predictive of success (Nitti & Raz)

• ↑success in spontaneous voiders (74%) compared to those on catheters (54%) (Foster & McGuire)

• No difference between retention (65%) and those with storage symptoms (67%) (Petrou et al)
Laparoscopic or Robotic Urethralysis

Robotic-Assisted Urethralysis for Urethral Obstruction After Retropubic Bladder Neck Suspension—A Case Series Report

- 6 patients s/p Burch
  - Open retropubic space
  - Remove Burch sutures
  - Mobilize urethra
- Median operative time 127 (93 – 210) min
- LOS 1-2 days
- Symptoms resolved in 5/6 (83%)
- 1 patient with SUI requiring treatment

Bogdan et al, J Endourol 28:214, 2014
Repeat Urethrolysis

- Scarpero et al, 2003
- 24 women failed ≥ 1 prior urethrolysis
- Repeat urethrolysis (transvaginal or retropubic)
- Mean follow-up 14 months

Repeat Urethrolysis

- **Retention Patients**
  - Normal emptying, relief of symptoms in 94%
  - PVR ≤ 100mL

- 91% able to get rid of catheters

**Post Void Residual (ml)**

Scarpero et al
Repeat Urethrolysis

• **Storage symptoms, no retention**
  
  – 16 patients
  
  • 2 (12%) completely resolved
  
  • 11 (69%) improved but require medication
  
  • 3 (19%) no improvement

• **Stress Urinary Incontinence**
  
  – Recurrent in 4 (18%), persistent in 2 (12%)
  
  – 5 underwent collagen with 80% improved

Urethrolysis Approach

• Transvaginal
  – Less morbid
  – Faster
  – Quicker Recovery

• Retropubic
  – Highest success rate
  – Failed transvaginal approach
  – Concomitant abdominal/retropubic surgery
  – Surgeon preference
Flap Interposition with Urethralysis

- **Transvaginal or Supra-emeatal**
  - Re-do surgery
  - Consider if urinary tract injury

- **Retropubic**
  - Easy access to flap
  - Peritoneum or omentum
  - Avoid “having to come back”
Conclusions

• **BOO after Incontinence Surgery**
  – 2-4% in modern era
  – Occurs even in experienced hands
  – Prevalence probably varies by your ability to recognize it
Conclusions

• Consider loosening/mobilization < 2 weeks
• Otherwise sling incision if sling
• Urethrolysis for others or failed incision

• Vast majority of interventions successful
• Earlier is better, but still offer if a long ways out
Complications of Prolapse Surgery: Prevention, Evaluation and Management

Howard B Goldman MD

Section of Female Pelvic Medicine and Reconstructive Surgery
Glickman Urologic and Kidney Institute
The Cleveland Clinic
Lerner College of Medicine
Cleveland, Ohio
Outline

• Perioperative
• Postoperative
  – Bleeding
  – Infection
  – DVT
  – Voiding dysfunction
  – Pain/Nerve Injury
  – Graft complications
Perioperative Complications

- Bleeding
- Bladder injury
- Ureteral injury
- Rectal injury
Bleeding

• Incidence depends on definition
• Varies by procedure
• Overall less than 2% require blood transfusion
  – Potential for significant bleeding during SSF
  – During abdominal sacrocolpopexy watch out for left common iliac artery
Sacrospinous fixation transvaginal
Bleeding

- Incidence depends on definition
- Varies by procedure
- Overall less than 2% require blood transfusion
  - Potential for significant bleeding during SSF
    - Stay 2 cm medial to ischial spine and superficial under the ligament – not necessary to go around entire coccygeous muscle
    - Pudendal vessels and nerves lay deep to the coccygeous and near/lateral to iliac spines.
Mild Bleeding

• Not unusual

• For very small bleeders
  – finish procedure - pack

• Larger bleeders
  – cautious cautery
  – oversew with absorbable suture
  – finish procedure and pack
Moderate-Significant Bleeding

• As on prior slide
• If deep in vagina/pelvis may be difficult to access
• Temporary packing
• **Judicious clip placement** – **Disposable long shaft**
• Disposable clip applier with long shaft
Moderate-Significant Bleeding

• As on prior slide
• If deep in vagina/pelvis may be difficult to access
• Temporary packing
• Judicious clip placement – Disposable long shaft
• **Hemostatic agents – Floseal**
Moderate-Significant Bleeding

• As on prior slide
• If deep in vagina/pelvis may be difficult to access
• Temporary packing
• Judicious clip placement – Disposable long shaft
• Hemostatic agents – Floseal
• **Embolization**
Bladder Injury

• Always try to close with multiple layers
• Straightforward in “traditional” cystocele repair
• If doing deep lateral dissection – mesh kits
  – May be difficult to visualize
    • Reapproximate tissue in that area – may only get one layer
  – Evaluate location of ureters – check for efflux
  – ? If mesh should be placed
    • My personal preference....
• Leave Foley catheter for 7-10 days
Ureteral Injury

- Many not diagnosed at time of surgery
- Delay in diagnosis contributes to morbidity
- At time of surgery can remove sutures and/or stent fairly easily
Ureteral Injury/Obstruction During Plication

- May catch or kink ureters
- 0.5-2%
- Check for ureteral efflux after sutures placed (without pulling too much)/tied
- If necessary remove sutures and redo
Ureteral Injury/Obstruction During Vault Suspension

• Not rare during ureterosacral ligament vault suspension 1-11%
• Ureter not far from USL
  • Stay medial and cephalad
• Check for ureteral efflux after sutures placed – put tension on them
  – I check again at end of case after all tied down
• If no efflux – cut sutures on that side and replace
Anatomic Considerations

Apical Compartment

Relationship of the Ureter to the Uterosacral Ligament

Ureteric course diverges from the ligament as it courses cephalad

Photo: James L. Raders MD
# Ureteral Injury


### Table: The incidence of ureteral obstruction and injury during vaginal surgery for pelvic organ prolapse

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of procedures Performed</th>
<th>Ureteral obstruction</th>
<th>Ureteral injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterosacral vaginal vault</td>
<td>355</td>
<td>21</td>
<td>3</td>
</tr>
<tr>
<td>ligament suspension</td>
<td></td>
<td>5.9 (3.9-8.9)</td>
<td>0.9 (0.2-2.6)</td>
</tr>
<tr>
<td>Proximal McCall culdeplasty</td>
<td>204</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.4 (4.4-8.2)</td>
<td>0.9 (0.3-4.5)</td>
</tr>
<tr>
<td>Colpocleisis</td>
<td>48</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2 (1.2-1.4)</td>
<td>—</td>
</tr>
<tr>
<td>Distal McCall culdeplasty</td>
<td>185</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.5 (0.1-1.3)</td>
<td>—</td>
</tr>
<tr>
<td>Anterior colporrhaphy</td>
<td>574</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.4 (0.1-1.3)</td>
<td>—</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Overall</td>
<td>700</td>
<td>36</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.1 (3.7-7.1)</td>
<td>0.9 (0.4-1.9)</td>
</tr>
</tbody>
</table>
Ureteral Injury during Dissection

• Unusual
  – More common in stage 4(3?) AVW prolapse

• Can occur with dissection deep to pubocervical fascia
  – Commonly used in synthetic mesh repairs

• Stent/Repair/Reimplant
Avoiding Bladder and Ureteral Injury

• Appropriate Exposure
• Stay in the right plane
  – Synthetic mesh – hydrodissection
  – Trochars – cysto with a 70 angle lens
• For stage 4 (?3) AVW prolapse – consider ureteral catheters
• Cystoscopy to check bladder integrity and ureteral efflux
Rectal Injury

• Can occur during rectocele repair or dissection for vault/enterocele

• Careful dissection

• Know where the rectum is at all times
  – ? Rectal pack?

• More common during repeat rectocele repair

• For SSF – don’t try to force retractors into pararectal space – place gently
Rectal Injury

• Almost always can do layered primary repair
• Call colorectal surgery to help
  — ? safer if any medicolegal issues arise
• Probably no need to keep NPO (if below peritoneal reflection) – follow the colorectal surgeons advice
• (If planned posterior mesh – would ABORT)
Postoperative Complications

- Infection
  - UTI – not rare
  - Wound infection
    - unusual
  - Deep Infection
  - Spondylodiscitis - ASC
Deep infection

• Pelvic abscess
  – Drain
    • Transvaginally – US guidance
    • Percutaneously – CT guidance
  – Antibiotics
Deep Infection

• Abscess in thigh
  – Related to arms of mesh passed through obturator region
  – Incise and drain
  – Antibiotics
  – Warm Baths
Pyogenic spondylodiscitis associated with sacral colpopexy and rectopexy: report of two cases and evaluation of the literature

Katie Propst • Elena Tunitsky-Bitton • Megan O. Schimpf • Beri Ridgeway
• Rare infection of disc space after abdominal sacrocolpopexy
• Often festers for some time
• Any unusual back pain after ASC
  – Get MRI

• Techniques to reduce risk
  – Proper identification of S1 vertebra
  – Awareness of suture and suture depth
  – Early treatment of uti/vaginal infection
Abdominal Sacro-colpopexy Suspension Suture Location

Avoid Area of L5-S1 disc space
Post-op Bleed

• Pack
  – Supportive care

• Arteriography
  – Embolize
Vesicovaginal Fistula

• Uncommon after cystocele repair
  – Unrecognized bladder injury at time of repair
  – Inadequate closure/drainage after recognized bladder injury

• More common with mesh repairs
  – Deeper dissection during repair
  – Placement of foreign body
VVF

- No mesh involved
  - Transvaginal repair after tissue healed
    - Usually more distal than typical VVF
      - Easier to access
    - Transabdominal repair if more comfortable with that approach
      - Not necessary to wait 3 months

- Mesh involved
  - Will discuss with intravesical mesh
Ureteral Injury

• Mean delay to dx – 5.6 days
• Multiple presenting symptoms
  – Incontinence
  – Flank pain
  – Sepsis
  – Ileus
  – 5% “silent” - dxed later as non-fxn/hydro kidney
• Typically some CT abnormality noted first
  – Hydroureteronephrosis down to pelvis
Ureteral Injury

• Cysto, retrograde, stent
  – Suture removal often necessary

• Percutaneous nephrostomy
  – Antegrade stent

• Reimplant
  – Usually at a later date – after stent/nephrostomy
Ureteral Injury

• 46 yo woman 4 days sp vag hysterectomy and uterosacral vault suspension

• At time of surgery had ? efflux on right and one stitch removed and replaced

• Now presents with right flank pain, nausea and vomiting
Pain

• Dyspareunia
  – Posterior repair
    • Vaginal stenosis
    • Ridging in posterior wall

• Mesh
  – Local tenderness
  – Forniceal/arm pain

• Nerve pain
  – Positioning – use padding and position carefully
  – Nerve entrapment
“Nerve Pain”

- Can occur with deep bite of USL

- Buttock pain in 10-15% of SSF suspension
  - May be due to nerve within SSF-coccygeous
  - Usually temporary
  - Anti-inflammatories/time

- Rare cases may require stitch removal

Graft Complications

- Biologic versus Synthetic
Biologic Graft Complications

• Infections/Fluid collections
  – Usually spontaneously drain
• Extrusion/Wound healing
  – May reepithelialize
  – May require removal
Synthetic Graft Complications

- Pain
- Vaginal Extrusion
- Intravesical Erosion
- Rectal Erosion
Pain – Fornix/Groin

• 2-5 %

• Often due to taut arm of mesh
  – Can usually palpate taut band in fornix

• Prevention – leave a bit of laxity

• Treatment
  – Anti-inflammatory
  – Local injection
  – Incision of arm
Incision of Arm

- Palpate arm
- Inject local in fornix
- Incise over arm
- Get around arm
- Incise arm
Pain At Body of Mesh

- Initial conservative management
- If persists remove
  - If not extruded – important to map out the exact areas of tenderness to make sure those areas are removed at time of surgery
Thigh/Groin Pain after Reconstruction with Mesh Arms through Groin

- Tension from arms - too tight?
- Removal of vaginal portion resolves pain in 2/3 of patients
- If not – may need thigh dissection to remove thigh portion of arms
Rectal Erosion of Mesh

• May be asymptomatic or can cause significant morbidity
• Probably under-reported as most do not do routine rectal exams
• Risk factors
  – Previous rectocele repairs
  – Rectal disease – can lead to disasters
    • Inflammatory Bowel Disease
    • Diverticulitis
Mesh Extrusion

• 3-15% - depending on series

• Prevention
  – Pre-op hormonal cream
  – Dissect and place deep to pubocervical fascia
  – Ensure mesh lays flat
  – Avoid excessive vaginal wall trimming
Mesh Extrusion - Management

• Observation – if not sexually active and not symptomatic
• Hormonal cream – I have not had much luck
• Trim in office – very small exposures
• Remove in OR
Removal of Mesh

- Decision of whether to remove just localized area of mesh vs all mesh
  - Based on sx, pain, etc
- Infiltrate with lidocaine with epinephrine
- Excise skin edges
- Undermine and remove mesh 1 cm from skin edges
- Utilize sharp and blunt dissection
  - Kitner/peanut
- Posterior — may benefit from finger in rectum
- Close vaginal skin
Experience with Mesh Removal

- Avg age – 60
- Prior medical tx – 84%
- Latency to presentation 17 wks (0-96)
- Indication for removal
  - Symptomatic mesh erosion 12 (63)
  - Recurrent pelvic organ prolapse 8 (42)
  - Chronic pain 6 (32)
  - Dyspareunia 6 (32)
  - Vesicovaginal fistula 3 (16)
  - Multiple indications 16 (84)

Experience with Mesh Removal

79% excised transvaginally
Follow up – 16-75 weeks
Pain scores – 0 (0-8 scale)
87% free of presenting symptoms

Purely Transvaginal/Perineal Management of Complications From Commercial Prolapse Kits Using a New Prostheses/Grafts Complication Classification System

Farzeen Firoozi,* Michael S. Ingber, Courtenay K. Moore,† Sandip P. Vasavada,‡ Raymond R. Rackley§ and Howard B. Goldman||

From the Glickman Urological and Kidney Institute, Center for Female Pelvic Medicine and Reconstructive Surgery, Cleveland Clinic, Cleveland, Ohio

Conclusions: Although technically difficult in some cases, purely transvaginal mesh excision appears to be safe with resolution of almost all presenting symptoms. Although slightly cumbersome, the new ICS/IUGA prostheses/graft complication classification system can be used to report and more accurately characterize mesh complications.
Mesh Extrusion after Abd Sacrocolpopexy

**Figure 5.** Kaplan-Meier Failure Curve for Mesh Erosion Using Last Clinic Visit as Right Censoring Date

Nygaard I, JAMA, May 2013
Extruded ASC mesh

• Handle similar to transvaginal mesh
• Can be difficult knowing when to stop cephalad dissection
• Often difficult as well suspended and near apex
Intravesical Mesh Erosion
Intravesical Mesh Erosion

• May be associated with VVF

• Can approach abdominally or transvaginally

• Most have reported a transabdominal approach
Intravesical Erosion of Anterior Mesh

Yamada BS, et al, Urology, 2006
Intravesical Mesh Erosion

- May be associated with VVF
- Can approach abdominally or transvaginally
- Most have reported a transabdominal approach

I prefer transvaginal approach
  - Good exposure
  - Minimal morbidity
  - Can remove almost all of mesh under bladder
Transvaginal Excision of Intravesical Mesh

- Determine where mesh is – cysto/palpation
- Bilateral ureteral catheters
- U flap in vaginal wall
- Identify mesh or cut through detrusor till get to mesh
- Cut mesh in midline
- Dissect overlying tissue off of mesh
- Dissect underlying mucosa/detrusor from mesh
- Excise mesh laterally
- Close mucosa
- Close multiple detrusor layers
- Close U flap – vaginal skin
- Foley for 2 weeks

Firoozi F and Goldman HB, Urology, 2010
• 76 yo female with chronic utis, urgency and urge incontinence
• PMH – plenty
• PSH – multiple
  – 18 mo sp placement of transvaginal anterior mesh for recurrent cystocele
• Transvaginal
• Stents placed
• Very deep in muscle
• Removal of mesh
• Ureters intact
Cysto at time of stent removal

Chromic from mucosal closure
Complications of POP Surgery

• Perioperative
• Postoperative
  – Bleeding
  – Infection
  – DVT
  – Voiding dysfunction
  – Pain/Nerve Injury
  – Graft complications
Complications of POP Surgery

• Prevention is the best treatment
• Identify at time of surgery – lowest morbidity if dealt with then
• Mesh repairs have introduced a number of new potential complications
• Even with significant complications – most patients can be treated with minimal residual morbidity
• Key is identifying problem and knowing how to deal with it
Post-surgical dyspareunia: How to avoid the contracted and scarred vagina

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What Do Women Want?
They want a vagina that works and doesn’t hurt
What has to go right?

- Introitus that is pliable, permits at least 2 fingerbreadths, has a smooth perpendicular plane between the posterior vaginal wall and perineal body
- Vaginal length of 8 cm or more
- No contraction rings or bands
- No fixation points that create friction/pulling
- Normal levator ani compliance/ function
- Normal vaginal epithelium
Complications of perineal laceration repair
Distorted perineal anatomy
Gaping genital hiatus
Why do problems develop?

- Underlying pain problem in selected patient?
- Surgical technique?
- Mesh problem?
- Healing problem?
Systemic pain disorders

- Women with a centralized pain processing problem (migraines, IC, vulvodynia, IBS, TMJ, CPP, back pain) are unlikely to do as well with any pelvic surgery
- Screen for these problems with great care
- Pre-operative Gabapentin (800 mg night before surgery)
- Avoid mesh
Traditional surgery
Posterior Repair

- 231 women
- Levator plication
- Questionnaire follow up
- Increase in sexual dysfunction from 18 to 27 % following Posterior repair
- Possibly due to narrowing and shortening

Sacrocolpopexy
### Analysis 1.27. Comparison 1 Surgery for upper vaginal (vault or uterine) prolapse, Outcome 27 Postoperative dyspareunia

Review: Surgical management of pelvic organ prolapse in women

Comparison: 1 Surgery for upper vaginal (vault or uterine) prolapse

Outcome: 27 Postoperative dyspareunia

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Method A n/N</th>
<th>Method B n/N</th>
<th>Risk Ratio M-H,Fixed, 95% CI</th>
<th>Weight %</th>
<th>Risk Ratio M-H,Fixed, 95% CI</th>
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<tbody>
<tr>
<td>1 abdominal sacral colpopexy vs vaginal sacrospinous colpopexy</td>
<td>0/15</td>
<td>4/26</td>
<td></td>
<td>17.5</td>
<td>0.19 [0.01, 3.26]</td>
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<td>Lo 1998</td>
<td>1/11</td>
<td>11/18</td>
<td></td>
<td>43.7</td>
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<td>Maher 2004</td>
<td>6/19</td>
<td>7/17</td>
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<td>38.7</td>
<td>0.77 [0.32, 1.83]</td>
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<tr>
<td><strong>Subtotal (95% CI)</strong></td>
<td><strong>45</strong></td>
<td><strong>61</strong></td>
<td></td>
<td><strong>100.0</strong></td>
<td><strong>0.39 [0.18, 0.86]</strong></td>
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Robotic Sacrocolpopexy

• Longer-Term Outcomes – RSCP

- 51 Subjects
  - 25 Robotic vs 23 Abdominal
- Mean follow-up 44 months

How to evaluate?

• Q-tip test of vestibule and vaginal epithelium
• Levator ani muscle assessment
• Then evaluate mesh: Look for tight bands/ violin strings, points of tension
• Does the whole mesh need to come out, or can you release mesh arms?
• Don’t forget to evaluate the bladder and rectum....
Treatment

Now What?!!
Approach

Team effort

• Physiotherapist
• High volume pelvic floor surgeon
• Pain specialist
Physiotherapy

• Will help with diagnosis and release of trigger points
• Dilator therapy
• Supportive role
Use steroids + lidocaine for scars
Surgical Excision of Mesh

- Pre-operative cystoscopy
- Careful EUA to define mesh and assess rectum
- Dilute Vasopressin solution
- Cut mesh in the midline
- Careful dissection of the mesh from the skin
- Sharp dissection between bladder/rectum
- Release as much tension as possible
- Facial plication if there is prolapse
Vaginal shortening

- Vaginal scar release and dilators
- Consider using Surgisis™ as scaffold for new vaginal epithelium
- Buccal mucosa?
- Full-thickness skin flaps last resort
Persistent Pain

- Obturator neuralgia
- Pudendal Neuralgia
- Both managed with a combination of central neuromodulation agents and nerve blocks
How to stay out of trouble

• Pain and dyspareunia are a reality with ANY pelvic surgery
• Reserve mesh for robust indications
• Do not assume equivalence of mesh kits
• Sacrocolpopexy is a good option
AVOID

- Aggressive epithelial trimming
- SSLF in women with TVL < 9 cm
- Repeat vaginal procedures
- Managing abnormal introital abnormalities in anatomy with silver nitrate and dilators
- Mesh kits
DO

• Frequently check vaginal and rectal caliber throughout procedure
• Aggressively manage vaginal scar tissue with local injections/ dilators/ PT
• Consider SCP instead of repeat vaginal operation