PELVIC ORGAN PROLAPSE AND INCONTINENCE SURGERY

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Director, Urogynecology
Pelvic Organ Prolapse Surgery

- Much more common than continence surgery
- Continence procedures often performed concomitantly
- Most commonly performed vaginally; abdominal routes include open, laparoscopic and robotic-assisted
Pelvic organ prolapse

- Pelvic organ sagging through the vagina may be defined as cystocele (bladder prolapse), enterocoele (bowel prolapse), rectocele (rectal prolapse), metrocele (uterine prolapse) or any combination of two or more of these conditions.
FIGURE 118-1. Sagittal section showing normal anatomy (A); cystocele and rectocele (B).

FIGURE 118-3. Posterior enterocele without eversion (A); enterocele with eversion (B).
Pelvic Support Disorders

- Hernia-like protrusions into the vagina by the bladder, rectum, or uterus, caused by weakness of pelvic ligaments, connective tissue, and muscles.
- Because women today are living longer, pelvic support disorders are becoming a greater gynecologic health issue.
- A woman has about an 11% lifetime risk of undergoing surgery for pelvic support disorders and incontinence.
- Causes of pelvic support disorders are most likely multifactorial; risk factors include trauma during childbirth, increased abdominal pressure secondary to obesity, chronic coughing or straining at stool, estrogen deficiency, and intrinsic connective tissue weakness.
Indications for surgery?
- Pessary unsuccessful or declined
- Symptomatic stage II-IV

Definition of successful surgery?
- What is the best method for assessing outcome that combines anatomical and functional results
Various types of pessaries: (A) Ring, (B) Shaatz, (C) Gellhorn, (D) Gellhorn, (E) Ring with support, (F) Gellhorn, (G) Risser, (H) Smith, (I) Tandem cube, (J) Cube, (K) Hodge with knob, (L) Hodge, (M) Gehrung, (N) Incontinence dish with support, (O) Donut, (P) Incontinence ring, (Q) Incontinence dish, (R) Hodge with support, (S) Inflatoball (latex).
More questions

- Is there a single best primary surgery or should this be individualized based on recurrence risk?
- What is the best way to minimize de novo functional problems, like dyspareunia and incontinence?
International Consultation on Urological Diseases (ICUD) Modification of Oxford System

- Levels of Evidence
  - 1. RCTs
  - 2. Prospective cohort
  - 3. Retrospective case control
  - 4. Case series
  - 5. Expert opinion without evidence
ICUD Modification of Oxford System

- Grades of Recommendation (positive or negative)
  - A. Usually consistent Level 1 evidence
  - B. Usually consistent Level 2 or 3 or “majority”1
  - C. Usually Level 4 or “majority”2/3, Delphi expert
  - D. Non-structured expert opinion, none/contradictory evidence
Difficulties with study classification

- Level of evidence
  - Quality of RCTs
  - Power
  - CONSORT (Consolidated Standards for Reporting Trials)

- Generalizability of the study
  - Difficult with laparoscopic surgery
Procedures for vault prolapse

- Vaginal approach vs Abdominal approach
  - 3RCT
  - Benson et al (1996)
Route of surgery: Abdominal vs Vaginal

- Experts: Tailor the surgery to the patient
- Practice: Most surgeons have strong preference and rarely deviate
- Evidence: Three randomized surgical trials
- Superior anatomical outcomes abdominally but at higher cost and morbidity
Sacral colpopexy
Depth, axis and caliber......

- Principles of pelvic organ repair.
Laparoscopic sacral colpopexy with Gynemesh as graft material—Experience and results

Neena Agarwala, MD, Nancye Hasiak, APRN, Marcia Shade, RN

Study objective

To evaluate the safety and efficacy of Prolene (Ethicon, Inc., Johnson and Johnson, Somerville, NJ) graft for sacral colpopexy and ease of use laparoscopically.
Abdominal Sacrocolpopexy

- Synthetic material superior to biologic tissue for bridging from vagina to sacrum
- Increased risk of synthetic mesh erosion with concomitant total hysterectomy or smoking
- Laparoscopic/robotic-assisted techniques feasible but comparative studies lacking
Sacrocolpopexy + total hysterectomy = 3–5x mesh erosion rates

- **Culligan et al 2002**
  - SC (n=234) 1.3%
  - SC&TAH (n=11) 27.3%

- **Brizzolara et al**
  - SC (n=64)
  - SC&hyst (n=60)

- **Bensinger et al 2005**
  - SC(n=35) 0%
  - SCH + SC (n=37) 0%
  - TAH+SC (n=49) 8.2%

- **Wu et al 2006**
  - SC (n=212)
  - SC &hyst (n=101)

- **Cundiff etal 2008**
  - SC (n=239) 4%
  - TAH +SC (n=83) 15%
Should the uterus be removed?

- Typically a normal, but displaced organ
- Concomitant total hysterectomy increases risk of mesh erosion
- Significant geographic and cultural differences in use of hysterectomy
- No high quality comparative studies available
Hysteropexy

- Hysteropexy (uterine preservation) is being used to minimize the risk of hysterectomy-associated mesh erosion
- A single Level 1 RCT provides evidence that outcomes of hysteropexy based repairs are inferior to hysterectomy based repairs; several conflicting Level 2 and 3 studies
Despite symptoms or urodynamic evidence of USI (reduced), de novo SUI may occur following prolapse repair.

Reduction testing techniques inadequate.

Increased risk of de novo SUI if pre-operative USI detected.
# CARE STUDY

<table>
<thead>
<tr>
<th>Advantage</th>
<th>3 months</th>
<th></th>
<th>24 months</th>
<th></th>
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<td></td>
<td></td>
<td>Burch</td>
<td>Control</td>
<td>P value</td>
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<tr>
<td>PFDI(i)</td>
<td>19%</td>
<td>39.7%</td>
<td>&lt;0.001</td>
<td>25.9%</td>
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<tr>
<td>Stress test</td>
<td>4.7%</td>
<td>8.6%</td>
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<td>SUI Rx</td>
<td>5.8%</td>
<td>11.0%</td>
<td>0.10</td>
<td>12.9%</td>
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<tr>
<td>SUI Endpoint (i)</td>
<td>22.4%</td>
<td>40.9%</td>
<td>0.002</td>
<td>32.0%</td>
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<tr>
<td>Bothersome SUI (i)</td>
<td>5.9%</td>
<td>24.5%</td>
<td>&lt;0.001</td>
<td>11.6%</td>
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# Laparoscopic Sacrocolpopexy

<table>
<thead>
<tr>
<th>Author</th>
<th>Paraiso</th>
<th>Cosson</th>
<th>Roset</th>
<th>Higgs</th>
<th>Von Theobald</th>
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<tbody>
<tr>
<td>N=</td>
<td>56</td>
<td>77</td>
<td>363</td>
<td>66</td>
<td>100</td>
</tr>
<tr>
<td>FU (months)</td>
<td>13</td>
<td>12</td>
<td>15</td>
<td>66</td>
<td>43</td>
</tr>
<tr>
<td>Success rate</td>
<td>Nr</td>
<td>Nr</td>
<td>96%</td>
<td>68-94% vault</td>
<td>96%</td>
</tr>
<tr>
<td>Complications</td>
<td>SBO 1</td>
<td>Mesh rej 1</td>
<td>SBO 1</td>
<td>Ero 9%</td>
<td>Convert 4</td>
</tr>
<tr>
<td></td>
<td>Erosions 2</td>
<td>Cx infm 1</td>
<td>Hernia 1</td>
<td>Convert 1</td>
<td>Cystotony 6</td>
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<tr>
<td></td>
<td>Reop 16%</td>
<td>Reop 8%</td>
<td>Erosion 2</td>
<td>Proctotony 1</td>
<td>Ureter 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ant recur 1</td>
<td>Reten 2</td>
<td>Enterotony 2</td>
<td>Vascular 2</td>
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</table>
Vaginal Surgery

- Typically performed as a complex procedure to address multiple anatomical defects including apical, anterior and posterior with or without perineorrhaphy
Anterior Vaginal Prolapse

- Commonly associated with apical support loss
- Anterior colporrhaphy is most common POP surgery
- Wide variability in technique
Conflicting data re: Absorbable polyglactin mesh for Ant colp (AC)

- Results of two RCTs conflict
- N=143: AC+M slightly protective
- N=83, AC+M, Ultra AC – no diff

- Major paradigm change: transvaginal synthetic mesh
- Reduces anatomic recurrence in anterior wall
- 2 kit prepared, 1 self prepared
- No evidence to recommend use in apex or posterior wall
## Addition of polypropylene mesh to the anterior repair

<table>
<thead>
<tr>
<th>Author</th>
<th>N</th>
<th>FU (yrs)</th>
<th>Success(%)</th>
<th>Complications</th>
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<tbody>
<tr>
<td>Cervigni</td>
<td>218</td>
<td>3</td>
<td>76</td>
<td>Erosion, Stenosis</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12%, 8%</td>
</tr>
<tr>
<td>De Tayrac</td>
<td>55</td>
<td>3</td>
<td>89</td>
<td>Dyspareunia, Erosion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17%, 9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shrinkage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>De Tayrac</td>
<td>87</td>
<td>2</td>
<td>92</td>
<td>Erosion, Dyspareunia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.5%, 17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cystotomy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>De Tayrac</td>
<td>132</td>
<td>1</td>
<td>93</td>
<td>Erosion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.3%</td>
</tr>
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</table>
# Anterior mesh use

<table>
<thead>
<tr>
<th>Author</th>
<th>Mesh Type</th>
<th>N</th>
<th>Success (%)</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiltunen</td>
<td>Polypropylene</td>
<td>104</td>
<td>97</td>
<td>Erosion 17%</td>
</tr>
<tr>
<td>RCT 2007</td>
<td>AC</td>
<td>97</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Sivaslioglu</td>
<td>Polypropylene</td>
<td>43</td>
<td>91</td>
<td>Erosion 7% Dyspareunia 5%</td>
</tr>
<tr>
<td>RCT 2008</td>
<td>AC vicryl</td>
<td>42</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Nguyen</td>
<td>Polypropylene (armed kit)</td>
<td>38</td>
<td>87</td>
<td>Erosion 5%</td>
</tr>
<tr>
<td>RCT 2008</td>
<td>AC</td>
<td>37</td>
<td>55</td>
<td>Dyspareunia and QoL =</td>
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</table>
Native tissue vaginal apical suspensions

- No evidence for the superiority of any native tissue vaginal apical suspension technique
- Sacrospinous has high cure rate but moderate anterior wall recurrences
- Uterosacral ligament has high cure rates and increased ureteral compromise
Uterosacral ligament suspension
Study Objective

Review of all laparoscopic uterosacral suspension outcomes and complications for patients with pelvic prolapse.
Posterior Vaginal prolapse

- Significant technical variability
  - Midline plication
  - Site specific defect repair
  - Levator plication/Levatorplasty
  - Trans anal techniques

- The anatomical cure rates higher than the functional outcome (bowel complaints)
## Rectocle trial

<table>
<thead>
<tr>
<th></th>
<th>Rectocle</th>
<th>RCT</th>
<th>Paraiso 2006</th>
<th>LoE 1</th>
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<tbody>
<tr>
<td>Site specific</td>
<td>Site specific</td>
<td>PC</td>
<td>Porcine derived acellular collagen matrix graft</td>
<td>P value</td>
</tr>
<tr>
<td>Number</td>
<td>37</td>
<td>37</td>
<td>32</td>
<td>0.02</td>
</tr>
<tr>
<td>Failure at 1 yr</td>
<td>22%</td>
<td>14%</td>
<td>42%</td>
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<tr>
<td>PFDI</td>
<td>146/46</td>
<td>114/39</td>
<td>116/44</td>
<td>0.65</td>
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<tr>
<td>PFIQ</td>
<td>87/22</td>
<td>65/10</td>
<td>63/5</td>
<td>0.65</td>
</tr>
<tr>
<td>PISQ</td>
<td>31/36</td>
<td>29/36</td>
<td>33/37</td>
<td>0.24</td>
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</table>
Rectocele repair
## Site specific vs Fascial Posterior repair

<table>
<thead>
<tr>
<th></th>
<th>Site Specific</th>
<th>Central Fascial Plication</th>
<th>P value</th>
<th>LoE 2</th>
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<tbody>
<tr>
<td>Number</td>
<td>124</td>
<td>183</td>
<td></td>
<td></td>
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<tr>
<td>Review Months</td>
<td>12.2</td>
<td>12.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective success</td>
<td>67%</td>
<td>86%</td>
<td>0.001</td>
<td></td>
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<tr>
<td>Bp</td>
<td>-2.2</td>
<td>-2.7</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Constipation</td>
<td>37%</td>
<td>34%</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>16%</td>
<td>17%</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Fecal Incontinence</td>
<td>19%</td>
<td>18%</td>
<td>NS</td>
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</table>

Source: Abramov 2005 Obstet Gyn
## Level 3 Evidence for Polypropylene Mesh Posterior compartment: Avoid

<table>
<thead>
<tr>
<th>Author</th>
<th>Type of mesh</th>
<th>FU period</th>
<th>Success</th>
<th>Complications</th>
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<tr>
<td>Lim 2007</td>
<td>Vypro Mesh</td>
<td>3 yrs</td>
<td>Rectocle recurrence 22%</td>
<td>Erosion 30% Dyspareunia 27%</td>
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<tr>
<td>Milani</td>
<td>1 Prolene Mesh</td>
<td>17 months</td>
<td>Success 94%</td>
<td>Erosion 6.5% Dyspareunia 63% Sexual activity dec 12%</td>
</tr>
</tbody>
</table>
Selection of Mesh

- Ideal augmenting material not known
- Gore Tex TM mesh should not be used as the risk of mesh erosion is significantly higher than other synthetic materials
- Few comparative studies using synthetic materials; majority of case series suggest larger pore size reduces erosion risk
Uncertainty regarding sequelae of mesh, both functionally and anatomically:

- Erosion
- Pain
- Retraction (shrinkage)
- Infection and sepsis
- Dyspareunia
- Compartment specific disorders
Colpectomy and Colpocleisis

- Effectively resolves POP in women who agree to vaginal closure procedure
- Has low rates of sexual related regret
Graft Interposition Colpocleisis

- Volume 14, Issue 6, Pages 740-745 (November 2007)
- Graft interposition colpocleisis, perineorrhaphy, and tension-free sling for pelvic organ prolapse and stress urinary incontinence in elderly patients
- Neena Agarwala, MD, Nancye Hasiak, APRN, Marcia Shade, RN
- Study objective
- We sought to describe the outcome of combined colpocleisis, perineorrhaphy, and tension-free sling procedure for advanced uterovaginal prolapse and stress urinary incontinence in patients who are elderly and medically compromised.
Grade A Recommendation

- Sacrocolpopexy is a highly recommended apical prolapse procedure
- Synthetic material is superior to biological material for this surgery
- Use of polypropylene mesh for transvaginal anterior wall repair improves 1 year anatomic outcomes; this advantage should be weighed against the risk of mesh-related complications and uncertainty regarding long term functional outcomes
Grade B recommendation

- A single RCT provides Level 1 evidence that concomitant Burch colposuspension is recommended in women without symptoms of SUI at the time of open sacrocolpopexy.
- Concomitant total hysterectomy at time of mesh-augmented repairs increases mesh erosion; consider alternate plans.
- When hysterectomy is indicated, concomitant anterior repair without augmenting materials is reasonable.
Grade B Recommendation

- When native vaginal apical suspension is planned, sacrospinous and uterosacral ligament suspension are recommended equally.
- No evidence to support use of synthetic mesh for transvaginal repair or augmentation in the posterior wall.
- Levator ani plication during PC should be used rarely in sexually active women because of increased risk of dyspareunia.
Grade C Recommendation

- Suspension of the apex by an appropriate method must be considered at the time of each vaginal prolapse repair.
- No evidence of superiority of any specific technique for transvaginal apical suspension using native tissue.
Grade D Recommendation

- Anatomic support defects without accompanying relevant symptoms are rarely an indication for prolapse surgery (minor anatomic defects don’t need correction)

- Evidence based surgical alternatives should be offered to all women planning prolapse surgery (including pessary)
Surgery for Urinary Incontinence in Women

- Surgery for stress incontinence
- Confounding variables
- Surgery for detrusor activity
- Urethral diverticulae
- Non-obstetric urinary fistulae
- Complications of surgery
- Outcome measures
Surgery for Stress Urinary Incontinence in women – worldwide trend
Surgery for stress incontinence

Other procedures
Mid-urethral tapes
TVT
Other retropubic tapes
Transobturator tapes
Mini tapes
Stress Incontinence

Sagging and weakness of the bladder neck. Urine leaks during a cough or movement.
Anterior Colporrhaphy

- Comparable to needle suspension
- Less effective than open colposuspension
- Effectiveness deteriorates substantially with time (LoE2)

Recommendation:
- Anterior colporrhaphy should not be used in the management of SUI alone (Grade A)
- MMK, Needle suspension and Paravaginal repair also should not be used for SUI management (Grade B)
Open Colposuspension

- Comparable success to
  - Mid-urethral retropubic slings (LoE 1)
  - Bladder Neck slings (LoE ½)
  - Transobturator slings (LoE 2)

- Risk of
  - voiding dysfunction > TVT (LoE 1) < BN slings (LoE 1)
  - Prolapse > TVT (LoE 1)
  - De Novo OAB = TVT (LoE 1)
Recommendation for Open Colposuspension

- Can be Recommended as an effective treatment for primary stress urinary incontinence, has longevity (Grade A)
Laparoscopic colposuspension

- Comparable to open with experienced laparoscopists (LoE ½)
- Cure rate ≤ TVT (LoE ½)
- TVT operative time and recovery < colposuspension (LoE ½)

Recommendations:
- An option for treatment of SUI (Grade B)
- Should only be performed by experienced laparoscopists (Grade D)
Rectus sheath fascial sling is effective (LoE1)

No good evidence comparing autologous, biological and synthetic slings
- Autologous fascia may be more effective (LoE 2)
- Adverse events more common with alternative materials (LoE 3)

Recommendations: Autologous fascial sling recommended as an effective treatment for SUI, and has longevity (Grade A)
Urethral bulking agents

- Similar symptomatic improvement with placebo and autologous fat (LoE 1)
- Less effective than conventional surgery (LoE2)
- May need to be seen against lower risks (LoE2)
- No evidence that one agent more effective than other (LoE2)
- No data comparing bulking agents with non-surgical or other minimal access surgical treatments.

Recommendations:
- Women should be made aware that
  - Efficacy diminishes with time
  - Repeat injections may be required
Durasphere™

- Helps the weak muscles of the bladder neck by adding bulk to the area. The added bulk allows the bladder neck to close enough to help stop urine from leaking.
# Stress Incontinence Surgeries

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<tr>
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<th>SUI</th>
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<tr>
<td><strong>Procedure</strong></td>
<td></td>
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</tr>
<tr>
<td>Anterior Colporrhaphy</td>
<td>Recommended</td>
<td>A</td>
</tr>
<tr>
<td>Transvaginal BNS (needle)</td>
<td>Not Recommended</td>
<td>B</td>
</tr>
<tr>
<td>Burch : Open</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Burch : Laparoscopic</td>
<td>B- only experienced laparoscopists</td>
<td></td>
</tr>
<tr>
<td>Paravaginal</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>MMK</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>BN sling: autologous fascia</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>BN sling: other</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Bulking agents</td>
<td>B</td>
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RCTs comparing TVT with traditional incontinence operations

5 trials: TVT vs open colposuspension
- No difference in objective (66-84% vs 51-90%) or subjective cure rate (72-92% vs 72-93%)
- Operation time, hospital stay and return to activity faster with TVT
- Bladder perforation more common with TVT 9% vs 3%
- ISC and need for prolapse surgery more common after colposuspension

4 trials: TVT vs laparoscopic colposuspension
- Higher objective cure rate with TVT in trials with more patients
- Operation time, hospital stay and return to activity faster with TVT

2 trials: TVT vs fascial sling

1 trial: TVT vs no treatment
Are all Mid urethral tapes the same?

- RCTs comparing TVT with retropubic modifications
  - 6 Trials
- RCTs comparing TVT with transobturator tape placement
  - 11 trials
  - Metanalysis Latthe et al BJOG 2007 (114)
  - When compared by subjective cure, TVTO and TOT at 2–12 months were no better than TVT (OR 0.85; 95% CI 0.60–1.21).
  - Adverse events such as bladder injuries (OR 0.12; 95% CI 0.05–0.33) and voiding difficulties (OR 0.55; 95% CI 0.31–0.98) were less common, whereas groin/thigh pain (OR 8.28; 95% CI 2.7–25.4), vaginal injuries or erosion of mesh (OR 1.96; 95% CI 0.87–4.39) were more common after tape insertion by the transobturator route.
TVT is equally effective as colposuspension and traditional sling operations (LoE ½)

Operation time, hospital stay and return to normal activity shorter with TVT than colposuspension (LoE ½)

Post-operative voiding problems and need for prolapse surgery are more common with colposuspension (LoE ½)

Pooled data in NICE guidance - 6x bladder injury for retropubic vs 4x urethral injury for transobturator
Support materials

- **Autologous**
  - Patient’s own tissue
  - Thigh, hip or abdomen
  - Second incision
  - No rejection

- **Allograft**
  - Donor tissue from cadavers
  - Have risk of disease transmission
  - Fascia seems to disappear

- **Synthetic**
  - Synthetic materials
  - Foreign body reaction
  - Prone to erosion
  - No risk of disease transmission

- **Xenograft**
  - Non-human donor tissue
  - May have risk of disease transmission
  - Tissue remodeling
Tension free vaginal tape procedure
Sling placement
Guide the Needle Tip to the Abdominal Incision

Tension Free......
Mid urethral Tapes
“Mini slings”

- Data immature
- No recommendations can be made at this point
Confounding variables

- Age
- Activity
- Medical illness
- Psychiatric illness
- Obesity
- Parity
- Previous continence surgery
- Hysterectomy during anti-incontinence procedure
- Race
- Severity and duration of symptoms
- OAB
- Urethral occlusive forces
- Surgical factors
Cystometrics
MUCP predictive of success for TOT/TVT outcomes in two trials using threshold values of 30/40 cam H2O (LoE 3)

VLPP predictive in 1 and not in 2 trials (LoE 3)

Conclusion: No conclusive value for urethral functional testing in predicting surgical outcome
Technique of Sling

- Training
- Cough test
- Anesthesia
- Optimal tape position
Mid urethral slings – contraindications

- Urethrovaginal fistula
- Urethral diverticulum
- Intraoperative urethral injury
- Untreated urethral malignancy (LoE 5)
Mid urethral slings – increased risk of complications including failure

- Radiation
- UTI
- Steroids
- COPD
- Anticoagulant therapy
- Vaginal atrophy
- Congenital anomalies: Exstrophy, ureteral ectopy
- Pregnancy planned
# Surgery for detrusor overactivity

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Level of Evidence</th>
<th>Recommendation (Grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endoscopic transection</td>
<td>4</td>
<td>Negative (C)</td>
</tr>
<tr>
<td>Bladder overdistention</td>
<td>4</td>
<td>Negative (C)</td>
</tr>
<tr>
<td>Ingleman-Sundberg denervation</td>
<td>4</td>
<td>Negative (C)</td>
</tr>
<tr>
<td>Phenol injection</td>
<td>4</td>
<td>Negative (C)</td>
</tr>
<tr>
<td>Posterior tibial nerve stimulation</td>
<td>(\frac{3}{4})</td>
<td>Positive (C)</td>
</tr>
<tr>
<td>Sacral Neuromodulation</td>
<td>(\frac{1}{2})</td>
<td>Positive (B)</td>
</tr>
<tr>
<td>Augmentation enterocystoplasty</td>
<td>4</td>
<td>Positive (C)</td>
</tr>
<tr>
<td>Tissue engineering</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>
Neuromodulation

- **SNS**
  - Effective for UI, U/F, and retention (LoE 2, 3, 4)
  - Evidence for durability (LoE 3)
  - Complications may limit durability – Lead migration
  - Necessity for continuous stimulation for effect (LoE 4)

- **PTNS**
  - Stimulation effective but durability is a concern (LoE ¾)
InterStim® Therapy -- Sacral Nerve Stimulation (SNS) for Urinary Control

- A revolutionary approach to managing urinary retention and the symptoms of overactive bladder, including urinary urge incontinence and significant symptoms of urgency-frequency alone or in combination in patients who have failed or could not tolerate more conservative treatments.

- Electrical stimulation of the sacral nerves that control voiding function.
Sacral Nerve Stimulation

- Used for refractory urgency, frequency and non-obstructive retention
- Needs a minimally invasive surgery for implantation
- Simplified implant procedure, now performed percutaneously with only local anesthesia.
- The tined lead holds
Step Two: The Implant

- Procedure done in day surgery center or operating room
- Chronic lead is placed above the tailbone area and a stimulator is implanted under skin
- System turned on within first week after implant
Battery programming

- Patient and physician

![Neurostimulator programming](image1.jpg)

**Battery longevity**

Using: Rate = 19-20 Hz, Pulse width = 210 μSec.

![Graph showing battery longevity](image2.jpg)
Activation of somatic afferent axons that modulate sensory processing and micturation reflex pathways in the spinal cord.

Suppression of interneuronal transmission of the bladder reflex pathway

Blocking of transfer of information from bladder to pontine micturation center

No effect on descending excitatory efferent pathway from brain to sacral parasympathetic preganglionic neurons

Prevents involuntary but not voluntary voiding.
Urethral Diverticulae

- No Grade A recommendations:
- Optimal diagnostic algorithm
- Adjuvant Rx for concomitant SUI
- Long term assessment
  - Recurrence rates (17%)
  - De novo SUI (38%)
  - Dyspareunia (22%) (LoE 3)
Sub-urethral diverticulum including 3 large stones: A case report

- Rachel Dickey, Neena Agarwala, MD
- Urethral diverticuli containing calculi are rare according to the literature. This middle aged female, with a former diagnosis of sub-urethral diverticulum, presented with acute pain, hematuria and incontinence. She was found to have 3 large stones in the diverticulum from a previous MRI and was diagnosed with a UTI at the time of presentation. A cystourethrogram and cystoscopy was performed and the UTI was treated. She then had an open diverticulectomy, removal of the stones, repair of the diverticular neck and placement of Surgisis™ zenograft which effectively resolved the diverticulum and stones.
No Grade A recommendations regarding:

- Optimal diagnostic algorithm
- Route of repair (transvaginal vs transabdominal)
- Timing
- Adjuvant grafts
- Drainage
Experiences with a xenograft (acellular bovine collagen matrix) in gynecologic fistula repairs

- Volume 13, Issue 5, Pages 483-485 (September 2006)
- Neena Agarwala, MD, Amber Cohn, MD
- Urogenital fistulas are significant, though uncommon, complications of gynecologic surgery, and fistula repair can be a challenging surgery for even the most experienced gynecologist. An interposition xenograft (acellular bovine collagen matrix), derived from bovine pericardium, has been used to accomplish successful repairs. We report on five urogenital fistula cases in which an interposition xenograft was used in achieving a successful repair. The use of an interposition xenograft is a successful option in urogenital fistula repair.
Complications of surgery

- True incidence not clear
- Reporting is uneven
  - Academic vs community practice
- Low incidence of most complications
  - Power calculation for RCTs may be difficult
  - National registries
- Proper training is likely to reduce complications (LoE 2/3)
- Maintenance of skills (National Institute of Health and Clinical Excellence -NICE 2006) “20 cases per year for each primary procedure”
- Recommendations: Classification of complications
  - Incidence and timing
  - Severity (morbidity)
  - Cost
Outcome measures –
Results vary according to measure used
Developed in non-surgery area
Insensitive to change
Test-retest validation
Clinical value not always apparent

Paul Hilton data
Many influences impact symptoms
Global Impression

Complications

Health Economics

Satisfaction

QoL

Expectations

Personality

Bother

Urodynamics

Moving to Global impression tool
Conclusion

- Until further research establishes a universal outcome tool, it is advisable to use multiple outcomes
  - Symptoms and separate bother questionnaire
  - Clinically important outcomes (pad use, reoperation rates, anticholinergics, clean intermittent self catheterization - CISC, recurrent UTI)
  - Complications
  - QoL tool with minimal clinically important difference- MCID
  - Global Impression Index
  - Health-economic Index
THE
END