

## W24: Approaches to Pelvic Organ Prolapse Surgery

Workshop Chair: Philippe Zimmern, United States

27 August 2013 14:00 - 17:00

Start	End	Topic	Speakers
14:00	14:30	Goals of repair and anatomical principles	<ul style="list-style-type: none"> <li>• Kimberly Kenton</li> </ul>
14:30	15:00	Vaginal repairs	<ul style="list-style-type: none"> <li>• Sandip Vasavada</li> </ul>
15:00	15:30	Laparoscopic repair & use of mesh	<ul style="list-style-type: none"> <li>• Kimberly Kenton</li> </ul>
15:30	16:00	Break	None
16:00	16:30	Robotic repairs	<ul style="list-style-type: none"> <li>• Philippe Zimmern</li> </ul>
16:30	16:50	Assessment of outcomes	<ul style="list-style-type: none"> <li>• Sandip Vasavada</li> </ul>
16:50	17:00	Case discussion and Q&A	<ul style="list-style-type: none"> <li>• Kimberly Kenton</li> <li>• Sandip Vasavada</li> <li>• Philippe Zimmern</li> </ul>

### **Aims of course/workshop**

This course is intended to update the reconstructive pelvic surgeon and all interested trainees on the pros and cons of modern surgical approaches in the management of pelvic organ prolapse. This interactive course will feature concise lectures on current debates with each approach, including robotic surgery. The course will include multiple surgical video clips, and provocative case discussions to enhance the interaction with the audience.

## APPROACHES TO PELVIC ORGAN SURGERY

Thursday, 30 May 2013, 09:50:25 GMT

Chair: Philippe E. Zimmern, MD

Speakers: Kimberly Kenton, MD

Sandip Vasavada, MD

### PROGRAM

Course Introduction Philippe Zimmern

00-30 1. Goals of Repair and Anatomical Principles Kim Kenton

30-60 2. Vaginal repairs Sandip Vasavada

60-90 3. Laparoscopic Repair & Use of Mesh Kim Kenton

Break 90-110

110-130 4. Robotic repair Philippe Zimmern

130-150 5. Assessment of Outcomes Sandip Vasavada

150-180 6. Case discussion and Q&A Moderator: Philippe Zimmern



## GOALS OF PROLAPSE REPAIR

Kimberly Kenton MD, MS  
Professor, Obstetrics & Gynecology and Urology  
Division Chief, Female Pelvic Medicine & Reconstructive Surgery

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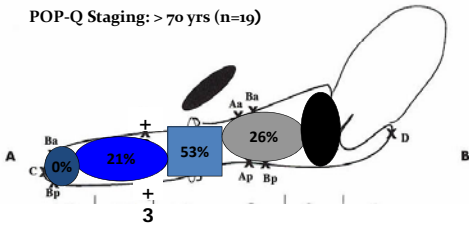
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## Clinically Relevant Anatomy

Swift, S., *The distribution of pelvic organ support in a population of female subjects seen for routine gynecologic health care. Am J Obstet Gynecol, 2000, 183:2*

POP-Q Staging: > 70 yrs (n=19)



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## Normal Support



- Connective tissue
  - Uterosacral ligaments
  - Cardinal ligaments
- Muscle
  - Levator ani
- Upper 2/3 vagina
  - Horizontal
  - Lay on levators

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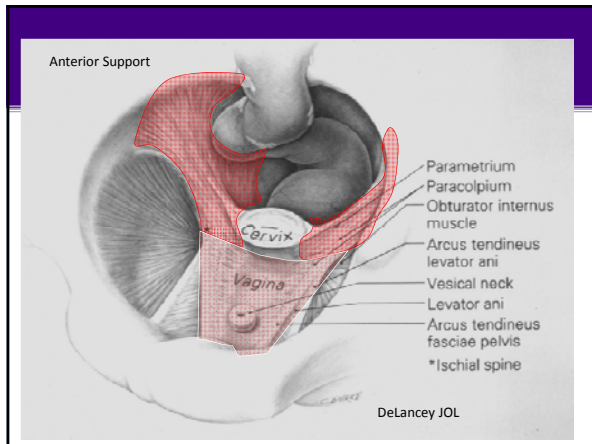
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### Why Worry About The Apex Anyway?

- Isolated anterior or posterior defects are **RARE**
- 1997 Hospital Discharge Survey
  - Isolated cystocele or rectocele repairs = 18% POP surgery
- $\geq$  Stage II POP
  - Linear relationship: apex & anterior & posterior vaginal walls
  - Anterior or posterior vaginal wall is  $\geq$  Stage II  $\Rightarrow$  Apex is within 2 cm hymen
    - Rooney K. AJOG 2006.

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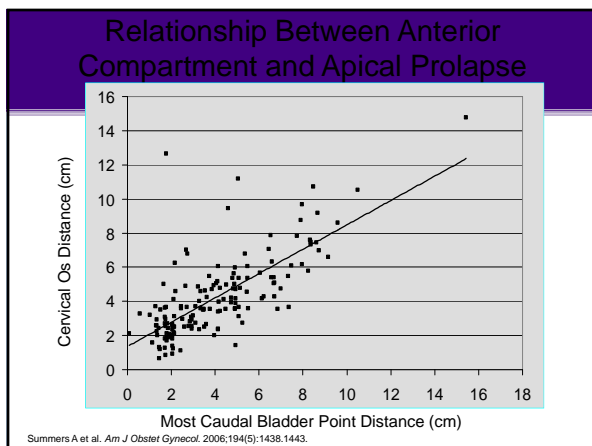
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## What About Other Factors?

Element	R <sup>2</sup>	Added	P value
Apical	.60		<.001
Vaginal length	.77	.17	<.001

77% explained by apex and length

Hsu Y et al. *Int Urogynecol J Pelvic Floor Dysfunct.* 2008;19(1):137-142.

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## Clinical Implications

- Apical support is the dominant factor in cystocele
- Surgically correcting apical descent is important in cystocele cure
- Tie apex into cuff closure during vaginal hysterectomy

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## Posterior Compartment

- Posterior repair  
– 149 Stage III-IV POP: Isolated SCPXY

	Pre-OP Mean±SD	1-Year Post-OP Mean±SD	P value
Anterior vaginal wall (Ba)	3.5±2.7	-2 ±1	<.0005
Apex (C)	1±5	-9±2	<.0005
Posterior vaginal wall (Bp)	1±3.6	-2±1	<.0005
Genital hiatus (Gh)	4±2	3± 1	.001

Concomitant repairs typically not necessary

Genital hiatus narrows with correction of apex

No need for concomitant anterior/posterior repair

Correction of apex corrects posterior and anterior vaginal wall defects

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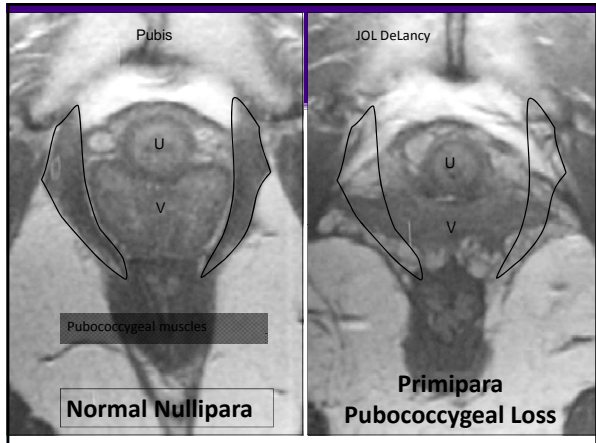
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Is Levator Damage Seen More Often in Women With Pelvic Organ Prolapse Than in

Case-Control Study

- 151 cases (POP-Q  $\geq +1$ )
- 134 controls (POP-Q  $\leq -1$ )

DeLancey JO et al. Obstet Gynecol. 2007;109(2)(Pt 1):295-302.

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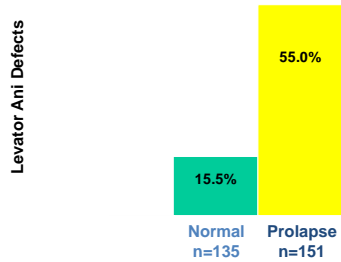
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## Major Levator Ani Defects: Case-Control Study of Pelvic Organ Prolapse



DeLancey JO et al. *Obstet Gynecol.* 2007;109(2)(Pt 1):295-302.

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## So, how should we select the best

- Determine outcomes meaningful to patients
  - Know individual patient's goals
  - Know procedures



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- Optimize
  - Patient satisfaction
  - Patient outcomes
  - Patient quality of life
- Minimize
  - Complication
  - Recovery



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## Best method for assessing outcomes?

- Optimal method is unclear
- No consensus of what constitutes “success”
- Wide variety of definitions for “success”
  - Results in highly variable estimates of success
- Shift toward patient centered outcomes

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# Traditional Anterior, Posterior, and Apical Compartment Repairs A Technique Based Review

Sandip Vasavada, MD

Center for Female Urology and Pelvic Reconstructive Surgery  
The Glickman Urological and Kidney Institute  
The Cleveland Clinic

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## “Traditional repairs vs Augmented repairs”

- Should we abandon “traditional repairs”?
- If no, then what situations to use
  - First time occurrence of prolapse
  - Thin tissues/ atrophic
  - Sexually active patients?
- Constant need to “innovate” or “keep up”
- Is this because traditional repairs are doomed to failure.....

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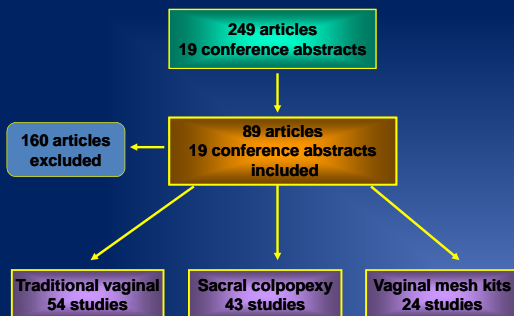
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Systematic Review of all Prolapse Surgeries. From Diwadkar et al, (Obst and Gynec, Feb 2009)



Courtesy of Mark Walters

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## Results of Vaginal Mesh Kits

- 3425 patients
- Mean follow-up of 17.1 months
- Most common complications:
  - Mesh erosion or infection 5.8%
  - Fistulas 0.2%
  - Dyspareunia 2.2%

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	Traditional Vaginal Repairs			Sacral Colpopexy			Mesh Kits		
	%	95% CI	Range	%	95% CI	Range	%	95% CI	Range
<b>Total complication rate</b>	15.3	14.7-16.3	0-52.8	17.1	16.1-18.1	0-52.2	14.5	13.3-15.7	0-23.1
<b>Reoperation for prolapse recurrence</b>	3.9	3.5-4.4	0-29.1	2.3	1.9-2.7	0-31.3	1.3	1.0-1.7	0-16.0
<b>Total reoperation rate</b>	5.8	5.3-6.3	0-29.2	7.1	6.4-7.8	0-26.2	8.5	7.6-9.4	0-30.0

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**Complication Grade By Repair Group**

	Traditional Vaginal Repairs		Sacral Colpopexy		Mesh Kits	
	%	95% CI	%	95% CI	%	95% CI
<b>Dindo Grade I</b>	6.2	5.7-6.7	5.5	4.9-6.1	3.9	3.3-4.6
<b>Dindo Grade II</b>	6.9	6.4-7.6	5.8	5.2-6.4	2.2	1.7-2.7
<b>Dindo Grade IIIa</b>	0.2	0.1-0.4	1.0	0.7-1.2	1.3	0.9-1.6
<b>Dindo Grade IIIb</b>	1.9	1.7-2.3	4.8	4.2-5.4	7.2	6.3-8.0

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**Conclusions of Review**

- Traditional vaginal procedures
  - Highest reoperation rate for prolapse recurrence
  - Lowest rates of complications that required surgical intervention
  - Lowest total reoperation rate
- Vaginal mesh kits
  - Shortest follow-up period
  - Highest rate of complications that required surgical intervention
  - Highest total reoperation rate (recurrence + complications)

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**Challenges in Vaginal Prolapse Surgery**

- Anterior Vaginal Wall Prolapse
- Apical Prolapse
  - At time of hysterectomy
  - Post-hysterectomy
- Posterior Vaginal Wall Prolapse

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## Anterior Vaginal Wall Prolapse



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## Four Defects of Anterior Vaginal Wall Prolapse

- **Repair of central defect**
  - re-approximation of widened pubocervical fascia
- **Repair of lateral defect**
  - Suspension/support of bladder base and apex
- **Urethra and BN support**
  - vaginal sling (if necessary), same or separate incision
- **Cardinal ligament repair/ Bladder base/ Apex**
  - dissection and approximation to midline

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## Anterior Vaginal Wall Prolapse

- **Identify and correct all defects**
  - Central and lateral defects if possible....
- **Evaluate potential other coexistent defects of pelvic organ support (e.g enterocele, rectocele, vault mobility)**
- **Assess and address potential urethral incompetence**

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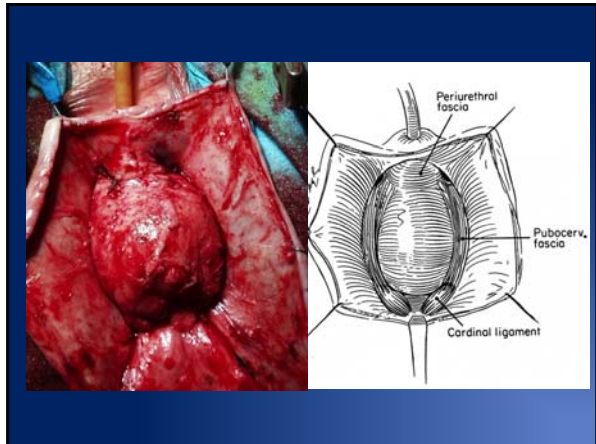
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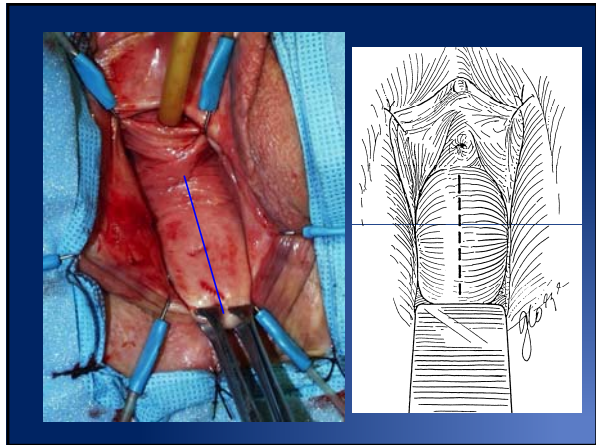
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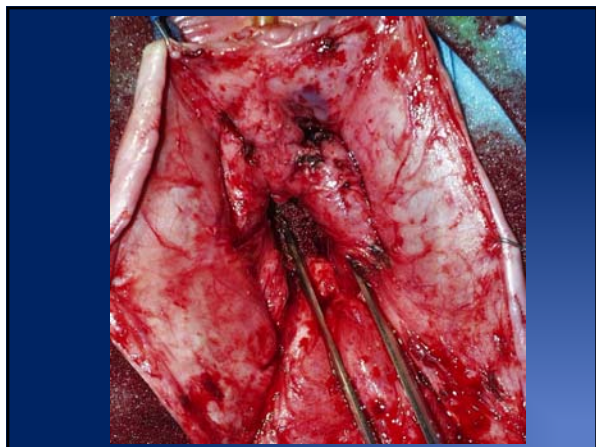
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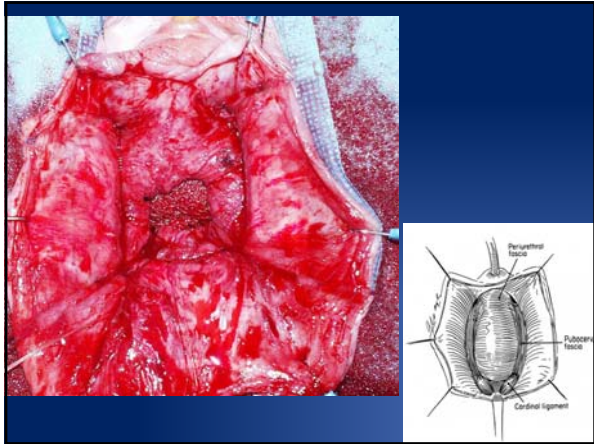
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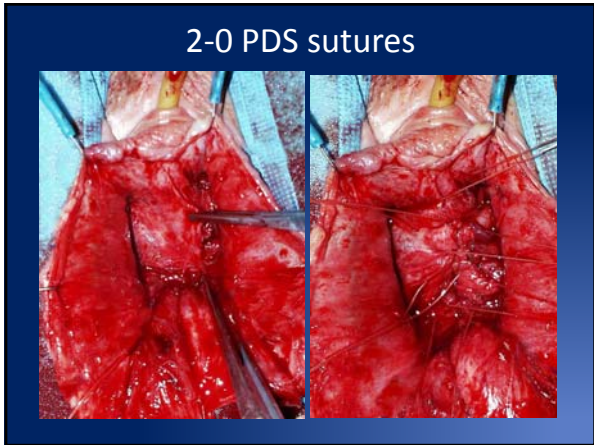
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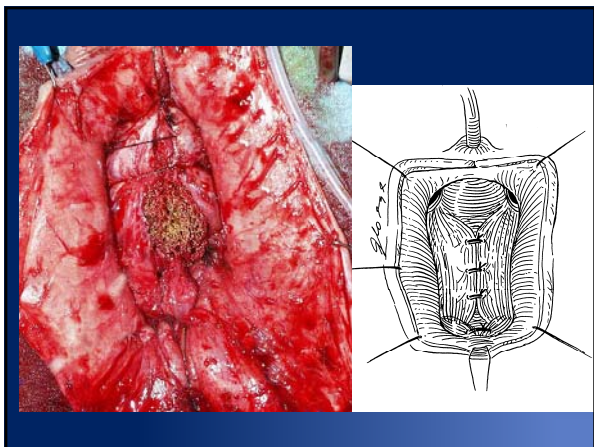
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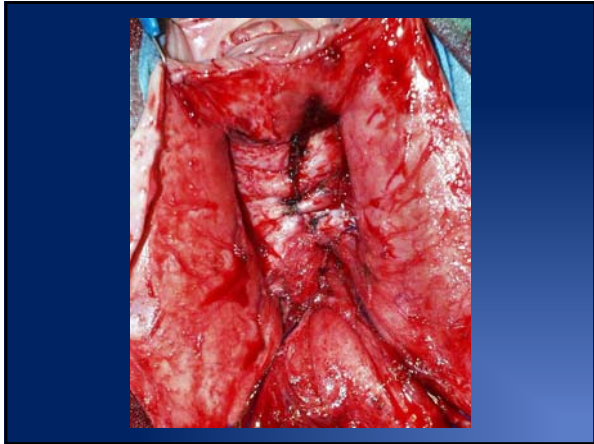
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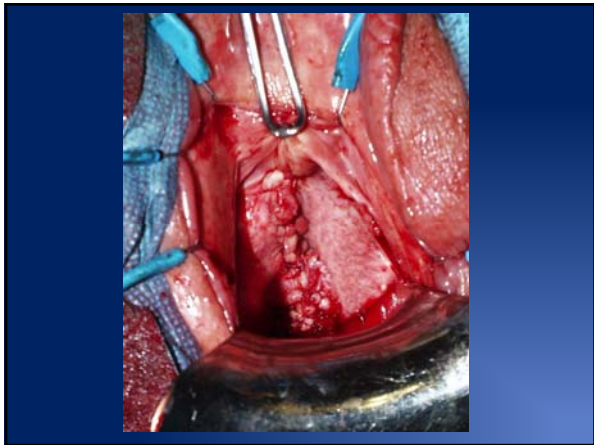
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Traditional Cystocele Repair

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## Anterior Colporrhaphy+/- Absorbable Mesh

- Weber, AM, Walters, MD, Piedmonte, MR, Ballard, LA (Am J Obstet Gyn 2001)
  - 109/114 patients underwent ant colporrhaphy 3 techniques
    - Standard
    - Standard + mesh (polyglactin)
    - Ultralateral colporrhaphy
  - Evaluated by POP-Q
  - Median follow up was 23.3 months
  - 7% stage I preop, 37% stage II preop, 54% stage III preop, 2% stage IV
  - 30% satisfactory outcomes after standard colporrhaphy alone, 42% standard + mesh, and 46% ultralateral colporrhaphy
  - VAS: symptom severity improved overall (6.0 +/- 2.7 → 1.1 +/- 0.8)
  - **Addition of mesh did not seem to make a difference**

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## Anterior Colporrhaphy

- Sand, PK et al. (Am J Obstet Gyn, June 2001)
  - Prospective randomized trial of stage 2 < cystocele with and without vicryl mesh
  - Follow up at 2,6,12,52 weeks postop
  - 80 with mesh, 80 none
  - Technique: mesh reduction of prolapse only
  - After 1 yr, 43% patients without mesh and 25% with mesh had recurrence to mid vaginal plane ( $p = 0.2$ ), concurrent slings may be protective as well
  - Mesh does make a difference

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## Conclusions

- The success rate of anterior colporrhaphy varies considerably depending upon the definition of treatment success used.
- When strict anatomic criteria are used, the success rate is low.
- When more clinically relevant criteria are used, treatment success is better with only 10% developing anatomic recurrence beyond the hymen, 5% developing symptomatic recurrence and 1% undergoing retreatment during the study follow-up.

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## Vaginal Vault Suspensions

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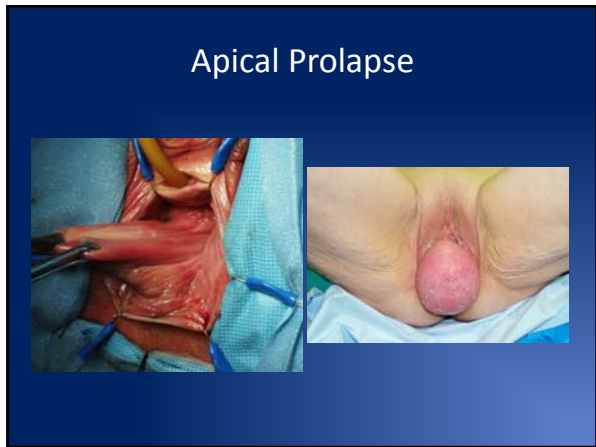
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- ### Objectives of Vaginal Vault Surgery
- Preserve normal vaginal axis
  - Minimize complication rates, blood loss, postoperative discomfort, and cost
  - Repair all coexistent pelvic floor defects
  - Attempt to restore
    - Vaginal anatomy
    - Visceral function
    - Sexual function
    - Quality of life

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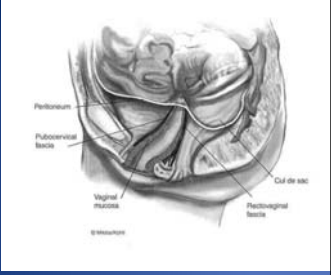
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## Vaginal Vault Suspension

- Many patients with significant prolapse have vault support weakness
- Many subsequent failures due to lack of vault suspension
- Resuspension of the vault anchors the anterior/posterior repair
- Why don't many repair vault?
  - Not properly diagnosed
  - Lack of adequate training
  - Time consuming, complex procedures



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## Solid Support of the Vaginal Apex is the Cornerstone of a Good Vaginal Prolapse Repair

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## Transvaginal Procedures for Vaginal Vault Prolapse

- Modified McCall's Culdoplasty
- Iliococcygeus Vaginal Vault Suspension
- Levator Myorrhaphy
- Sacrospinous Ligament Fixation (SSLF)
- High Uterosacral Vaginal Vault Suspension (USVVS)
- Total Vaginal Mesh Apical Suspension
- Colpocleisis

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### Abdominal Repairs for Vaginal Vault Prolapse

- Open Abdominal Sacrocolpopexy
- Open Uterosacral Ligament Suspension
- Laparoscopic Abdominal Sacrocolpopexy
- Robotic Sacrocolpopexy

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### Mayo/McCall culdoplasty

- Elevation of vaginal apex to high uterosacral ligament
- Proven efficacy in enterocele repair
- Wide experience in specific centers
- Reported high success rates
- Usefulness in complete prolapse in question

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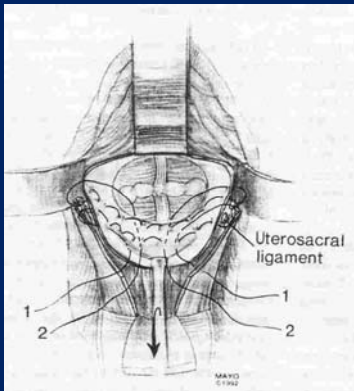
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### Mayo Culdoplasty

- 660 patients, posthysterectomy vault prolapse (TVH - 43%, TAH - 49%)
- questionnaire and/or telephone contact
- follow-up 11-22 yrs.
- satisfaction - 82%
- complications: bladder/bowel entry (2.3%), ureteral damage (0.6%), hematoma (1.3%)
- subsequent repairs - 5.2% none - 71%
- "bulge" - 11.5% none - 61.2%

Webb, Aronson, Ferguson, Lee. *Obstet Gynecol* 1998;92:281-5.

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### Iliococcygeus suspension

- Transmucosal sutures placed to coccygeus fascia, bilaterally
  - inferior to white line, anterior to ischial spine
- Reported success rates similar to sacrospinous fixation
- Simplicity and decreased morbidity
- May allow for only 6-7 cm depth

Shull, et al. *Am J Obstet Gynecol* 1993;168:1669-77.  
Meeks, et al. *Am J Obstet Gynecol* 1994;171:1444-54.  
Peters, et al. *Am J Obstet Gynecol* 1995;172:1894-902.  
Maher, Dwyer, et al. *Obstet Gynecol* 2001;98:40-4.

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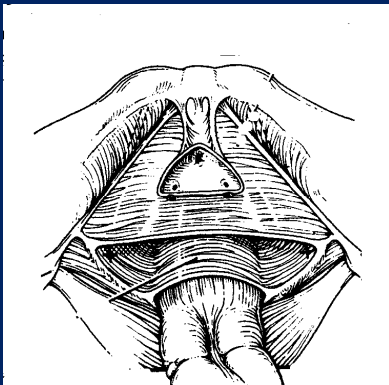
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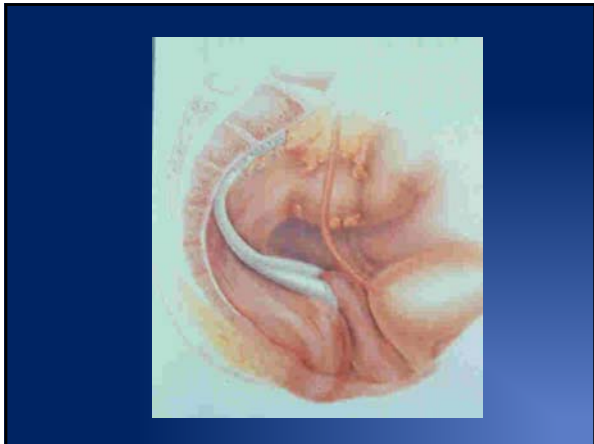
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### Levator Myorrhaphy

- Transvaginal placement of sutures through levator complex and shelf towards midline to anchor upper vagina
- Similar in concept to Mayo Culdoplasty
- Uses #1 absorbable sutures thru neovaginal apex and into levator muscles bringing them towards the midline to contralateral side. Then, 2 purse string sutures to close enterocele sac

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### Levator Myorrhaphy

A fluoroscopic image showing the placement of a suture during a levator myorrhaphy procedure. The image shows the internal pelvic structures in grayscale, with a bright white suture line visible.

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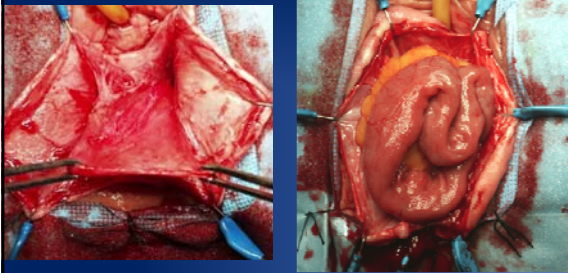
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Exposing peritoneal sac



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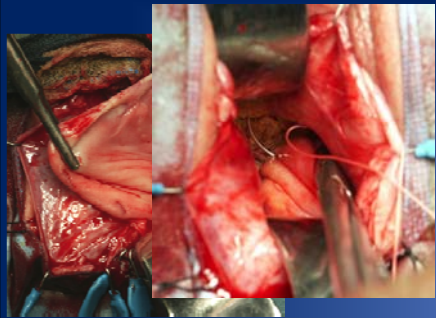
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Vault suspension sutures



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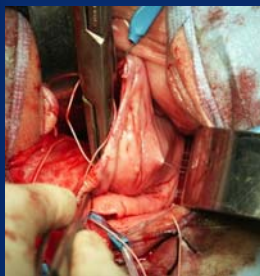
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Out of peritoneal sac  
1 cm from original entrance



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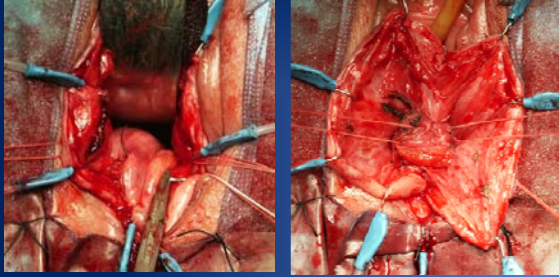
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### Purse string sutures Pre-rectal



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### Levator Myorrhaphy Results

- Lemack, GE et al (Eur Urol Dec 2001)
  - 35 patients (mean age 71, f/u 27.0 months)
  - 5 recurrent prolapse (3 ant enterocele, 1 vault)
  - 7/35 recurrent cystoceles (5 grade 1, 2 grade 2)
  - Satisfaction > 90% in 17/35
  - One ureteral injury

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### Sacrospinous Ligament Fixation

- Objective success 73-97%
- Various definitions of success
- Sites of failure often not specified
- Prospective trials:
  - ASC vs SSLF
  - Abd better (Benson)
  - Maher (equivalent)



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### Uterosacral Vaginal Vault Suspension

- Placement of sutures through “normal” vaginal apical suspension points
- Thought to be more physiologic suspension of apex
- Addresses level I and II support continuity
- Low, but not insignificant complication of ureteral injuries as the ligament is close to the ureters especially distally

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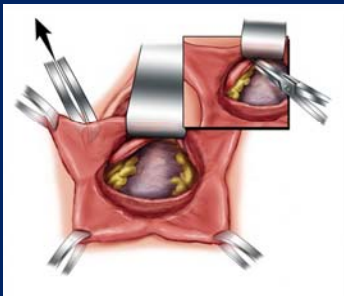
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### Uterosacral Vaginal Vault Suspension



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### Uterosacral Vaginal Vault Suspension



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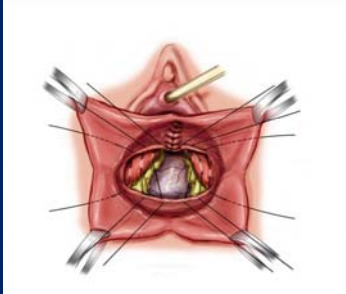
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### Uterosacral VVS




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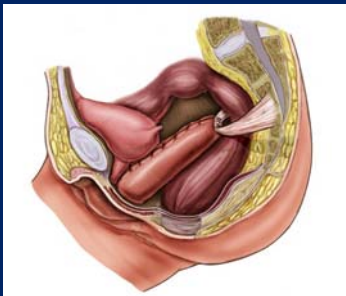
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### Uterosacral VVS




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### Uterosacral VVS Results

First Author	Year	No.	Follow-up Months (range)	Definition of anatomic success	Anatomic success -all segments	Anatomic recurrence by segment	Reoperation for POP
Jenkins	1997	50	(6-48)	Not defined	96%	Anterior 4%	None reported
Comiter	1999	100	17 (6.5-35)	Grade 0-1	96%	Apex/enterocele 4%	4 (4%)
Barber	2001	46	15.5 (3.5-40)	Stage 0-1 or asymptomatic Stage 2	90%	Apex 5% Anterior 5% Posterior 5%	3 (6.5%)
Karram	2001	168	21.6 (6-36)	Grade 0-1	88%	Apex 1% Anterior or posterior 11%	11 (5.5%)
Shull	2001	289	Not stated	Grade 0-1	95%	Apex 1% Anterior 3.5% Posterior 1.4%	None reported
Amundsen	2003	33	28 (6-43)	Stage 0 or 1	82%	Apex 6% Posterior 12%	None reported

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## Posterior Compartment Repairs

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## Posterior Wall Prolapse

- May occur in up to 50% of patients with concomitant anterior and apical defects
- Rectocele
- Enterocele
- Sigmoidocele
- perineocele

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## Rectocele repairs when to do ?

- Symptomatic
  - Defecatory dysfunction
  - Digitation
  - Symptomatic bulge
- Asymptomatic: caution....
  - Size ??
  - Risks and benefits ?
    - Pain
    - Dyspareunia
- How about at time of sacrocolpopexy ?

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## PELVIC FLOOR REPAIR Traditional

- *Rectocele repair* by plication of prerectal and pararectal fascia
- *Narrowing the levator hiatus* by approximation of levator fascia
- *Perineal repair* by approximation of bulbocavernosus, transverse perineum and anal sphincter

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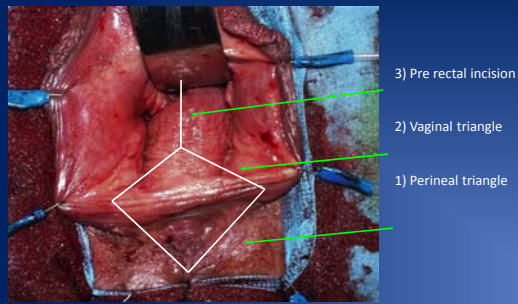
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## Pelvic floor repair



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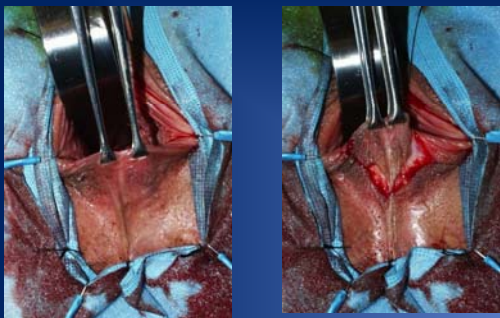
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## Perineal incision



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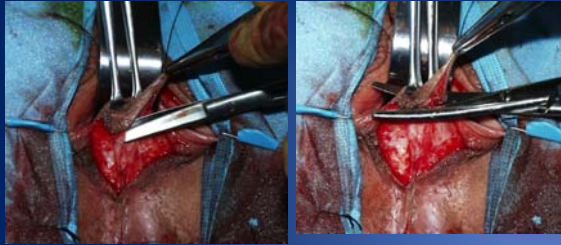
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Dissection and excision



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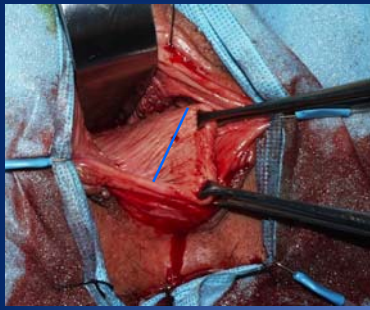
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Posterior vaginal triangle



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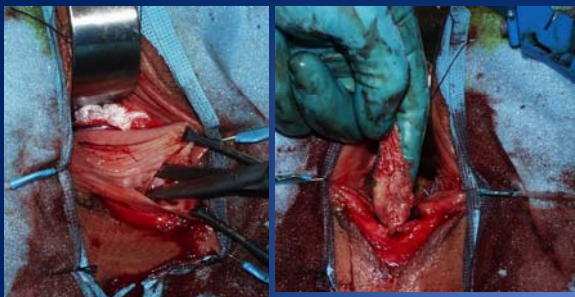
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Dissect and excise posterior triangle



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Dissection and excision posterior vaginal wall



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## PELVIC FLOOR REPAIR

- *Rectocele repair* by plication of prerectal and pararectal fascia
- *Narrowing the levator hiatus* by approximation of levator fascia
- *Perineal repair* by approximation of bulbocavernosus, transverse perineum and anal sphincter

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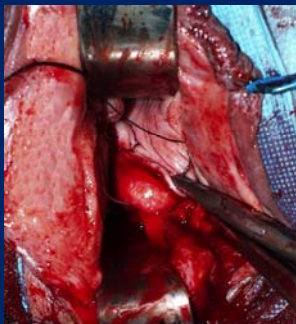
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Inclusion of Pararectal and Prerectal fascia



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## Pelvic Floor Repair

Steps as Necessary

- *Rectocele repair* by plication of prerectal and pararectal fascia
- *Appropriately narrowing the levator hiatus* by approximation of levator fascia
- *Perineal repair* by approximation of bulbocavernosus, transverse perineum and anal sphincter

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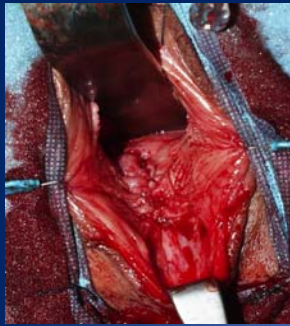
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## Re-approximation of levator hiatus



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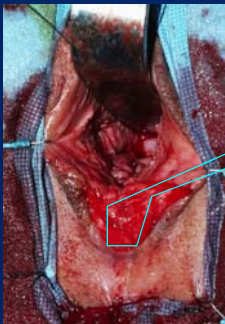
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## Perineal repair



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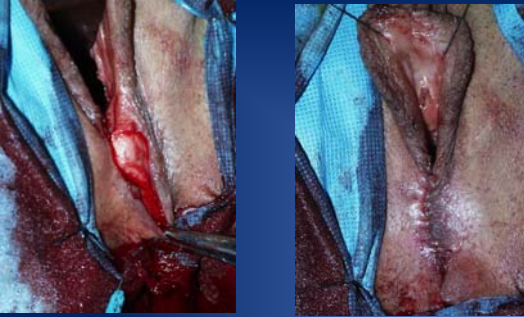
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### Perineal repair




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### Standard Posterior Colporrhaphy

Study	N	Mean Follow-up (mo)	Anatomic Cure (%)	Vaginal Dystrophia (%)	Defecatory Dysfunction (%)	Fecal Incontinence (%)	Dyspareunia (%)	De novo Dyspareunia in Sexually Active Patients, n (%)
McIlgren et al	25	12	96	50	100	8		2 (8)
Postoperative	25		0		88	8		
Weber et al	53	12						14 (26)
Postoperative	53							
Sand et al*	70	12	90					
Postoperative	67							
Maher et al	38	12.5	89	100	100	3	37	1 (4)
Postoperative	38		16		13	0	5	
Paraiso et al†	37	17.5	86	4	80			(20)
Postoperative	28		35		32		45	

\* Prospective studies only.  
† Two randomized controlled trials.

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### Site Specific Repairs



Study	N	Mean Follow-up (mo)	Anatomic Cure (%)	Vaginal Dystrophia (%)	Defecatory Dysfunction (%)	Fecal Incontinence (%)	Dyspareunia (%)	De novo Dyspareunia in Sexually Active Patients, n (%)
Sandall et al*	69	12	82	39	71	13	29	1 (2)
Postoperative	61		25	39	8		19	
Kenyon et al*	66	12	90	30	41	30	28	3 (7)
Postoperative	46		15	57			8	
Wester et al*	125	6	82	24	60	24	67	3 (4)
Postoperative	72		21	50	21	46		
Ahramov et al*	124	12	56		33	15	8	12 (11)
Postoperative	124				37	19	16	
Singh et al	42	18	92		57	9	31	
Postoperative	33				27	5	38	
Glavind and Madsen	67	3	100		40		12	2 (3)
Postoperative	67				4		6	
Paraiso et al†	37	17.5	78	58	85		48	(14)
Postoperative	27		21	35		28		

\* Retrospective studies, the remainder are prospective.  
† Prospective, randomized controlled trials.

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### Graft Augmented Posterior Repairs

Study	N	Mean Follow-up (mo)	Anatomic Cure (%)	Graft Type	Defecatory Dysfunction (%)	Vaginal Digitation (%)	De novo Dyspareunia in Sexually Active Patients n (%)	Mesh Erosion (%)
Milani et al <sup>†</sup>	63		94	Prolene	45		4 (6)	13
Postoperative					30			
Altman et al <sup>‡</sup>	32	38	62	Acellular porcine dermis (Pelvicol)	100			
Postoperative	23				< 50			
Sand et al <sup>†</sup>	73	12	92	Polyglactin				
Postoperative	65							
Paraiso et al <sup>†</sup>	31	17.5	54	Acellular porcine small intestinal Submucosa (Fortagen)	97	51		
Postoperative	26				21	7	(6)	

<sup>†</sup> Prospective studies only.  
<sup>‡</sup> Randomized controlled trial

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### Conclusions

- Prolapse is an ever changing field
- Address apex if at all possible
- Mesh use data suggests better anatomic outcomes but are they using same “success criteria”?
- Traditional cystocele repairs probably “work” better than we give credit for
- Use rectocele repairs as necessary but maybe tide has changed in “prophylactic repairs”: use symptoms instead

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## LAPAROSCOPIC SACROCOLPOPEXY

**Kimberly Kenton MD, MS**  
 Professor, Obstetrics & Gynecology and Urology  
 Division Chief, Female Pelvic Medicine & Reconstructive Surgery

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## 2010 Cochrane Review

ASC vs SSLS

□ 3 RCT

- ASC
  - Lower rate of recurrent vault POP
  - Lower grade POP when recurrence
  - > time to recurrence
  - Less dyspareunia

- SSLS
  - Shorter OR time
  - Quicker recovery
  - Less expensive

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## ASC vs SSLS

- 6 months: Apex ≥ Hymen
- N=89, vault

	Apex	Anterior	Posterior	Subjective
ASC	4%	7%	17%	94%
SSLS	19%	14%	7%	91%

Maher CF, et al. Abdominal sacral colpopexy or vaginal sacrospinous colpopexy for vaginal vault prolapse: A prospective randomized study. Am J Obstet Gynecol 2004;190:20-6.

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### ASC Outcomes

- -Long-term outcomes for robotic & open ASC comparable
- -Robotic ASC
  - maintenance of anatomic support and pelvic floor function 44 months after surgery

[Geller EJ, Parnell BA, Dunivan GC. Robotic vs abdominal sacrocolpopexy: 44-month pelvic floor outcomes. *Urology*. 2012;79:532-6].

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### RCT's Laparoscopic vs. Robotic Assisted

Paraiso M, OG 2011;118  
N=78 (R=40, L=38) vault prolapse

- Robotics Longer
  - Incision to closure [67 min (43-89 min)]
  - Anesthesia, room time, suturing

Anger JT et al.  
N=78 (R 40, L 38) SCH (60%) / vault

- Robotics Longer (21 mins, p<0.03)
- No difference in subjective or objective outcomes

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### Expert Opinions – 4 Important Tips

- Use graft rather than direct sacral affixation of the vagina, but avoid playing synthetic graft on a denuded vaginal apex
- Spread vaginal sutures over to spread out tension (anterior and posterior), rather than simple fixation at the apex
- Avoid excessive tension on the anterior vaginal graft to minimize the SUI risk
- Decrease presacral hemorrhage risk by suture placement thru anterior longitudinal ligament closer to the promontory, rather than at S3-4

Nygaard I, *Obstet Gynecol* 2004;104:805-23

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### Patient Positioning

- Arms tucked & pronated
- Hands & bony prominences protected
- Feet resting on heels in supportive stirrups
  - No pressure on popliteal fossa, lateral knee



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### Trendelenburg

- Remember that patient may slide towards head of bed
  - Keep bowel out of pelvis
  - Access to presacral space
- Must use material to prevent sliding:
  - Gel mat, bean bag
  - Shoulder supports
  - Taping patient to table
- Lower extremities move closer to surgical site
  - Must be re-positioned to a "hips neutral" position



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### Positioning: Prevent Patient Sliding

- 2 Options
  - Shoulder Pads



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### Positioning: Prevent Patient Sliding

#### Hug U Vac



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### Positioning: Low-rise stir-ups



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### Local Anesthetic

- Inject subcutaneously prior to incision
- May decrease post-op pain
- Use needle to localize accessory trocar path



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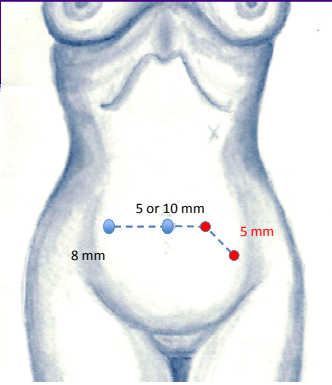
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### Port Placement

- 5 or 10 mm umbilicus
  - 10 if morcellating
- 8 mm accessory port
  - Pass suture
- 2, 5 mm for sewing



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### Gortex® Suture for 8 mm port



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### Lucite Stent



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### Soft Polypropylene Mesh



- 2 Strips vs “Y”
- Anterior
  - Several centimeters
- Posterior
  - Rectal reflection
- NO concomitant vaginal repair

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### Below Promontory



**Most Prominent Structure**

- 73% - Intervertebral disc
- 27% - Superior aspect of S1

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### Pre-sacral Dissection

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Posterior Dissection

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Sewing Mesh on Vagina

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Fixing Mesh on Sacrum

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Pre-sacral Suturing

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Lessons learned .....

- Patient positioning EVERYTHING!
  - Maximum Trendelenberg
  - Hug U Vac
- Low profile Allen stir-ups
- Minimal mesh (dose effect)
- Fixation of mesh
  - 2 separate pieces
  - Posterior first
- Don't over-correct anterior wall - "loose"
- Suture just below promontory

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Thank you for your attention!



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Speaker: Philippe E. Zimmern, MD

#### 4. ROBOTIC REPAIR

Pelvic organ prolapse (POP) will occur in over 11% of women who are post-hysterectomy and there is a lifetime risk of 19% in the general female population for undergoing a surgical procedure for POP<sup>1</sup>. There are numerous proven surgical options for women with POP including trans-vaginal repair with or without mesh interposition, and mesh sacrocolpopexy (MSC) using either an open or a laparoscopic approach. Open MSC is considered the gold standard surgical technique for correction of POP with long term success rates approaching 78-100%<sup>2</sup>. The main drawback of open MSC when compared with a trans-vaginal repair is peri-operative morbidity secondary to the large incision necessary for completion of the procedure. Laparoscopic approach has become a more attractive option especially after the advent of the da Vinci® robotic system which allows for improved ease of maneuvering and intra-corporeal suturing. Up to this point, there have been few series reported in the literature on robotic sacrocolpopexy (RMS) with mostly short follow-up. We describe our current technique and present a table summary of main published series in the literature so far.

#### Technique

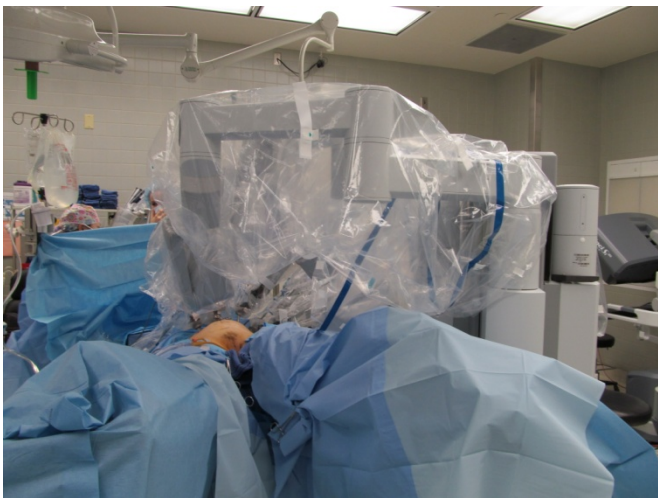
The RMS is performed using the da Vinci® robot. This system utilizes two robotic arms, a camera arm and an optional fourth robotic arm. The bladder is drained with a 16 French foley catheter. An EEA clamp is placed in the vagina at the beginning of the procedure to aid with prolapse dissection. After gaining pneumoperitoneum and in maximum Trendelenburg position, the camera is inserted through a 12 mm port at the umbilicus, with the robotic arms inserted following a 'W' shape configuration as previously described<sup>6</sup>. An assistant port is placed laterally on the right side, for a total of 5 ports. Docking the robot was done initially at the foot of the bed, however more recently we have evolved to docking from the side in order to maintain access to the vagina. Any abdominal adhesions are taken down as necessary to free the pelvic cavity. At this point small intestines, omentum and left colon are retracted into the upper abdomen, sometimes aided by the Endo Paddle® (a laparoscopic retracting device). Once the pelvis is fully exposed, the trajectory of the right ureter is identified as well as the area of the promontory. Next,

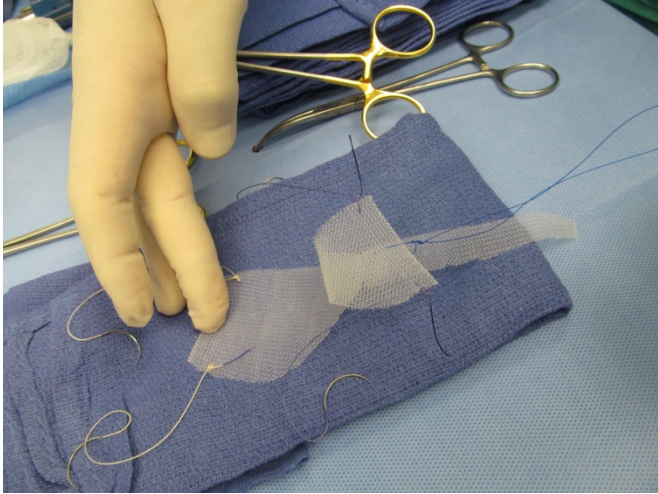
the peritoneum is opened at the back wall of the vaginal cuff transversely in order to gain access to the recto-vaginal space. Then, the dissection is continued anteriorly between the vaginal cuff and the base of the bladder when an anterior compartment prolapse is involved. The anterior dissection is carried distally to above the level of the trigone (3-5 cm distal to the vaginal apex). Posteriorly, the dissection is carried down as distally as possible. The peritoneum over the vaginal cuff is left intact whenever possible to diminish the risk of vaginotomy and of secondary erosion by thinning out the vaginal wall in that area. The peritoneum is then incised from the bottom of the enterocele sac to the sacral promontory on the right side of the rectosigmoid. At this point, the anterior vertebral ligament is exposed. Next, on the back table the anterior and posterior components of the mesh are sutured together in a Y-shape fashion and are measured, trimmed and secured with 2-0 polyglactin sutures at each extremity. The prepared mesh is introduced into the abdomen through the assistant port. The mesh is secured as distally as possible over the posterior vaginal wall with the preplaced absorbable sutures. Additional sutures are placed more proximally and bilaterally over the posterior vaginal wall near the vaginal apex. Because these sutures are absorbable, there is no concern about possibly transfixing the vagina and obtaining a strong vaginal purchase. The anterior portion of the mesh is then secured to the anterior vaginal wall in a similar fashion. Once secured to the vagina, the mesh is then laid in its prepared peritoneal groove extending up to the anterior vertebral ligament. The mesh is secured to the anterior vertebral ligament using two, 2-0 Ethibond® non-absorbable, sutures. The mesh is positioned to follow the concavity of the sacrum, under no tension to ensure vaginal cuff support in a normal anatomic configuration. The peritoneum is then closed over the mesh using running 2-0 polyglactin sutures. A pack is placed in the vagina for 24 hours. The robot is undocked and the port sites are closed in a standard fashion. After IV injection of indigo carmine, cystoscopy is performed to confirm no bladder or ureteral injury.

Table: Review of published robotic sacrocolpopexy series (2006-2012)

Authors	N	Type of Mesh	Type of suture for vaginal mesh anchoring	Anatomic results	mesh erosion	Re-operation for POP	Follow up (months)
Moreno Sierra, et al <sup>18</sup>	31	polypropylene	Non-absorbable	0% recurrent apical prolapse	NR	None	24.5
Tan-Kim, et al (2011) <sup>19</sup>	43	Gynemesh®	2-0 polypropylene	0% recurrent apical prolapse	5%	NR	6
Akl, et al <sup>20</sup> (2009)	80	polypropylene (unspecified)	2-0 prolene	1.25% recurrent apical prolapse	6%	2 rectocele/cystocele repairs, 1 revision of MSC	4.8
Kramer, et al <sup>15</sup> (2009)	21	polypropylene (AMS)	2-0 polyglactin	5% recurrent apical prolapse, 57% recurrent vaginal wall prolapse	0%	12 secondary cystocele or rectocele repairs	25.2
Geller, et al (2008) <sup>6</sup>	73	Intepro®	CV-2 polytetrafluoroethylene	NR	NR	None	1.5
Daneshgari, et al (2007) <sup>21</sup>	12	polypropylene (unspecified)	permanent (unspecified)	0% apical prolapse reported	NR	NR	3.1
Elliott, et al (2006) <sup>9</sup>	21	Intepro®	1-0 polytetrafluoroethylene	5% recurrent apical prolapse	9.5%	1 transabdominal MSC	24

NR=not reported





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## Assessment of Outcomes of Prolapse Repairs

Sandip Vasavada, MD  
Cleveland Clinic Glickman Urological Institute  
Cleveland, Ohio

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## Outcomes Assessment

- What is best measure?
  - Symptoms
  - Bulge
  - Anatomic measurement (i.e. Baden-Walker or POP-Q)
  - Satisfaction
  - Physician assessment

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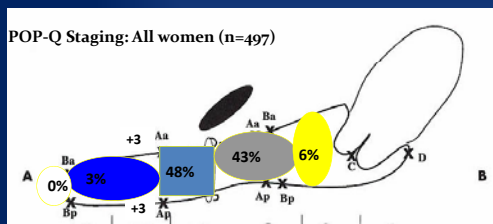
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## Epidemiology of POP

Nearly half would not meet NIH definition for “optimal” or “satisfactory” anatomic outcome



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### Defining success

- Some degree of loss of anatomic support is normal
- Perfect anatomic support is associated w/ worse HRQOL (PFIQ 10pts worse for Stage 0 than Stage 1 or greater)
- Symptomatic cure is more clinically relevant than anatomic cure
- Definitions of anatomic success commonly used are too strict and often not clinically relevant

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### What is a failure after Prolapse surgery?

- Reoperation or retreatment?
- Complications ?
- Recurrence of symptoms?
- Anatomic recurrence
  - Stage 2+?
  - Beyond hymen?
  - Stage 3+?

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### Anterior colporrhaphy: A randomized trial of three surgical techniques

Anne M. Weber, MD, Mark D. Walters, MD, Marion R. Piedmonte, MA, and Lester A. Ballard, MD  
*Cleveland, Ohio (Am J Obstet Gynecol 2001;185:1299-306.)*

- RCT, n = 114, May 1996 – 2000
- Cure: POPQ, Aa & Ba  $\leq$  -2
- % Cure at last follow-up
  - Standard 30%
  - Standard + Polyglactin 910 mesh 42% NS
  - "Ultralateral" anterior colporrhaphy 46%
- Mean follow-up: 23.3 months (4.5 to 43 months)

*Courtesy of Matt Barber*

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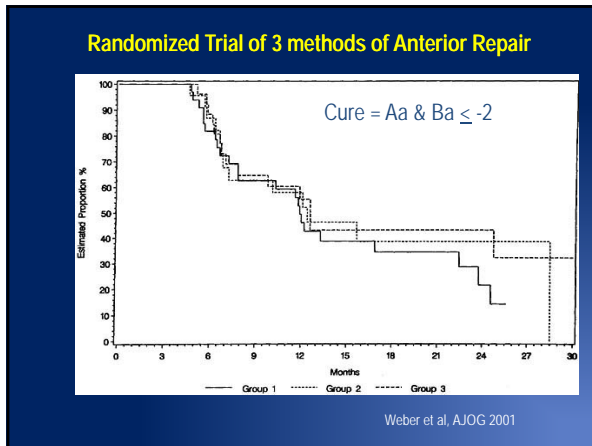
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### Definition of Cure

- 2001 NIH Workshop on Standardization:
  - “Optimal” anatomic outcome – Stage 0
  - “Satisfactory” anatomic outcome – Stage 1
- NIH definitions too strict
  - over 75% of women presenting for annual exams would not meet “optimal” definition and 40% would not meet the “satisfactory” anatomic outcome definition.

Weber et al, IUGJ 2001

Swift et al, AJOG 2000  
Swift et al, AJOG 2005  
Trowbridge et al, AJOG 2008

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### Definition of Cure

- The hymen is an important threshold for symptom development.
- The pelvic symptom that best correlates with advanced prolapse is a vaginal bulge that can be seen or felt.
- The absence of vaginal bulge symptoms postoperatively has a significant relationship with a patients assessment of treatment success and HRQOL while anatomic success alone does not.

Swift et al, 2000  
Tan et al, 2005  
Bradley et al, 2005  
Barber et al, 2010

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NIH Pelvic Floor Disorders Network Recommendation

Success after POP surgery:

- No prolapse beyond the hymen (Aa, Ba, C, Ap, Bp  $\leq$  0)
- No vaginal bulge symptoms and
- No retreatment

Barber et al, Obstet Gynecol 2010

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Objective

Reanalyze the results of the trial by Weber et al comparing three techniques for surgical correction of anterior vaginal prolapse using more clinically relevant definitions anatomic and symptomatic prolapse recurrence.

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Methods

- Re-analysis of trial by Weber et al
- 114 subjects undergoing surgery for anterior vaginal prolapse randomized (1:1:1) to one of three techniques
- Exclusions: any planned incontinence procedure other than suburethral plication.
- Pre- and Post-operative data abstracted from original case report forms.
- Follow-up at 6, 12, 24 months:
  - POPQ exam by blinded examiner
  - Symptom questionnaires (VAS)

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## Methods

- Prolapse VAS : “How much are you bothered by symptoms related to vaginal prolapse” (0 “not at all” – 100 “extremely”)
- Treatment success:
  - POPQ Ba, Bp, C  $\leq$  0 cm
  - Absence of prolapse symptoms (VAS < 20)
  - No retreatment

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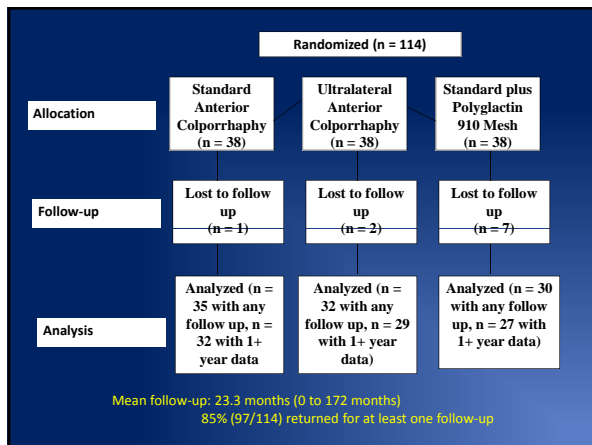
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## Concurrent Surgery

- TVH 53%
- Posterior colporrhaphy 94%
- Enterocele repair 26%
- Vaginal vault suspension 44%

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### Outcomes at one year

	Standard	Ultralateral	Mesh	Overall
Median POPQ value (range)				
Ba	-1.5 (-3 to +1)	-1.3 (-3 to +4)	-1 (-3 to +2)	-1 (-3 to 4)
C	-6 (-9 to +1)	-6 (-10 to +4)	-6 (-7.5 to -2)	-6 (-10 to 4)
Bp	-3 (-3 to +1)	-2.5 (-3 to +4)	-3 (-3 to 0)	-3 (-3 to 4)
No prolapse beyond the hymen	25/28 (89%)	22/26 (85%)	22/23 (96%)	69/77 (90%)
Absence of POP Symptoms	32/32 (100%)	27/29 (93%)	21/23 (91%)	80/84 (95%)
No reoperations for POP	32/32 (100%)	29/29 (100%)	27/27 (100%)	88/88 (100%)
No prolapse beyond hymen, no symptoms, no retreatment	25/28 (89%)	21/27 (78%)	21/23 (91%)	67/78 (86%)

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### A Few More Considerations..

- Just because bulge is gone, does not mean all is ok
  - Incontinence
  - Defecatory dysfunction
  - Sexual dysfunction
  - Mesh complication
- *Re-assess patient outcomes and goals and expectations*

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### Conclusions

- The success rate of anterior colporrhaphy varies considerably depending upon the definition of treatment success used.
- When strict anatomic criteria are used, the success rate is low.
- When more clinically relevant criteria are used, treatment success is better with only 10% developing anatomic recurrence beyond the hymen, 5% developing symptomatic recurrence and 1% undergoing retreatment during the study follow-up.
- Patient outcomes and expectations should be reviewed

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