

W23: Approaches to pelvic organ prolapse surgery

Workshop Chair: Philippe Zimmern, United States

21 October 2014 09:00 - 12:00

Start	End	Topic	Speakers
09:00	09:30	Goals of repair and anatomical principles	<ul style="list-style-type: none"> • Sandip Vasavada
09:30	10:00	Vaginal repairs	<ul style="list-style-type: none"> • Kimberly Kenton
10:00	10:30	Laparoscopic repair & use of mesh	<ul style="list-style-type: none"> • Kimberly Kenton
10:30	11:00	Break	None
11:00	11:20	Robotic repairs	<ul style="list-style-type: none"> • Philippe Zimmern
11:20	11:40	Assessment of outcomes	<ul style="list-style-type: none"> • Sandip Vasavada
11:40	12:00	Questions	All

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.

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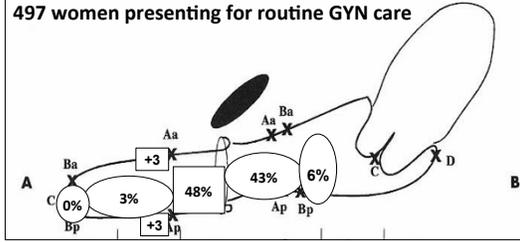
GOALS OF PROLAPSE REPAIR

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

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Know NORMAL Anatomy

497 women presenting for routine GYN care

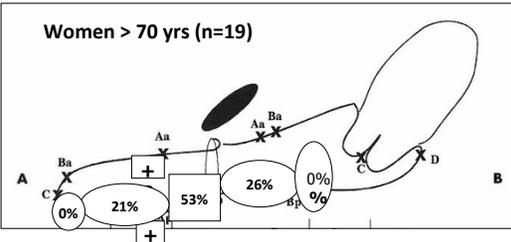


Swift, S., Am J Obstet Gynecol, 2000, 183:2

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Normal Anatomy

Women > 70 yrs (n=19)



Swift, S., Am J Obstet Gynecol, 2000, 183:2

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Relationship: Anatomy & Symptoms

- Vaginal bulge = symptom that most strongly correlates with POP-Q
- Bulge at the hymen seem to be when patients notice it and become symptomatic
- Surgery for <+1 – likely not necessary

(Swift S et al 2003; Bradley CA et al 2005)

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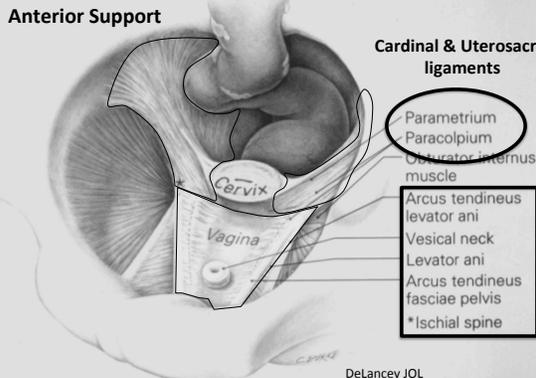
Normal Support



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

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Anterior Support



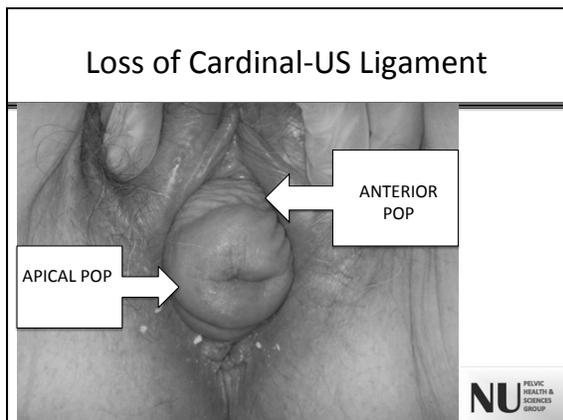
Cardinal & Uterosacral ligaments

- Parametrium
- Paracolpium
- Obturator internus muscle

Anterior Support

- Arcus tendineus levator ani
- Vesical neck
- Levator ani
- Arcus tendineus fasciae pelvis
- * Ischial spine

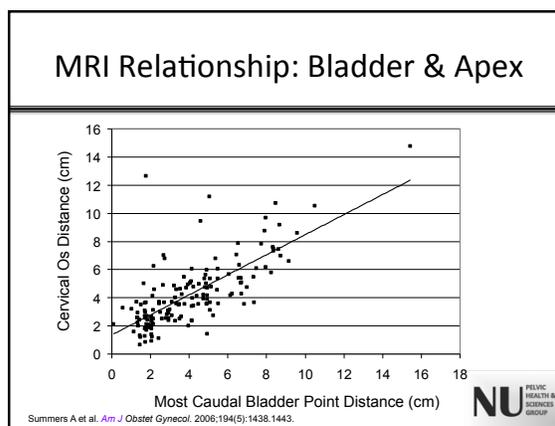
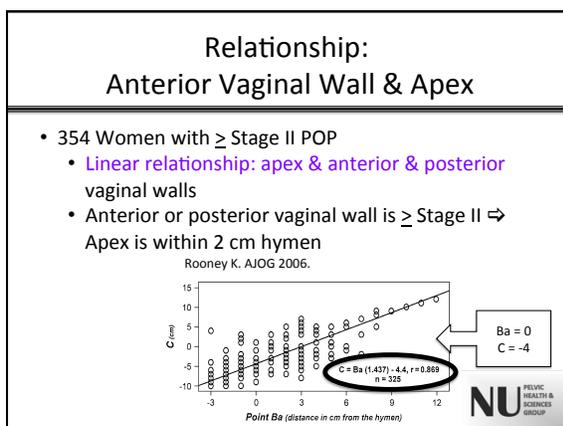
Delancey JOL



Anterior Defects

- Isolated anterior or posterior defects are **RARE**
- 1997 Hospital Discharge Survey
 - Isolated cystocele or rectocele repairs
 - **18% POP surgery US**
- REMEMBER APEX

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What About Other Factors?

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

77% cystocele size 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 anterior vaginal wall support
 - Surgically correcting apical descent is important in correcting anterior vaginal wall POP
 - Necessity for concomitant anterior repairs unclear
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Posterior Compartment

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

Most prolapsed point	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



Guahi M et al

Anterior & Posterior Repairs

- 258 women underwent
 - ASC
 - ASC ± PR (worse pwv support and bowel symptoms preoperatively)
- No difference in anterior, apical or posterior POP-Q points postoperatively (3 mo, 1 year)

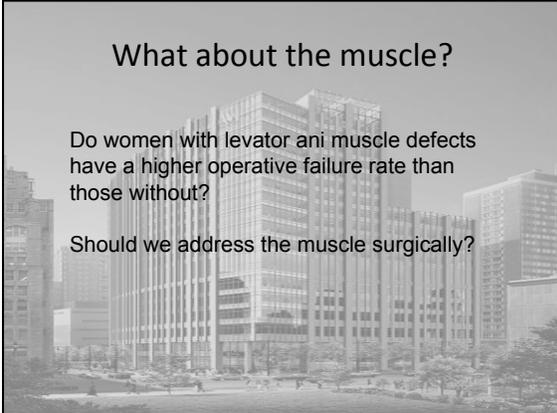
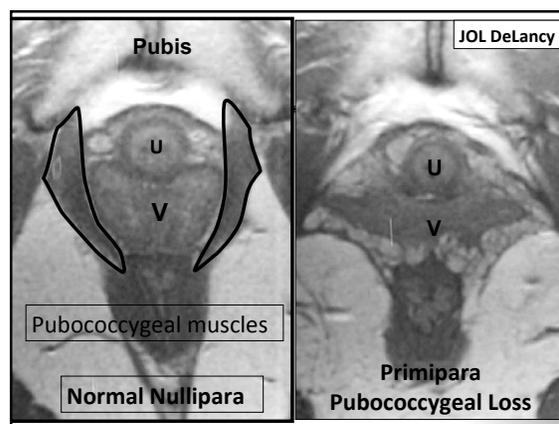
Kaser D et al 2012



What about the muscle?

Do women with levator ani muscle defects have a higher operative failure rate than those without?

Should we address the muscle surgically?

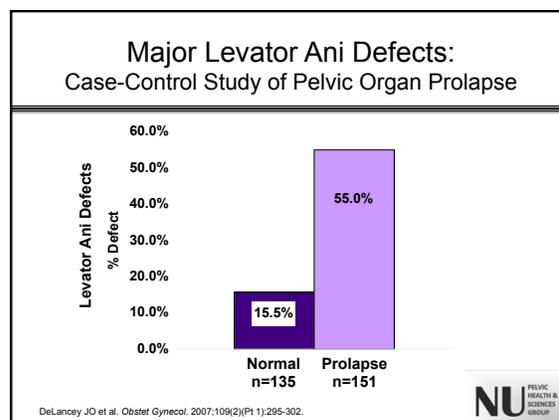
Levator Defects

Case-Control Study

- 151 cases with POP
 - (POP-Q ≥ +1)
- 134 controls
 - (POP-Q ≤ -1)



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



Goals for POP Surgical Repair

- Understand each defect
 - Apical
 - Anterior
 - Posterior
- RARE to have anterior or posterior defect without APICAL defect as well
- If only going to fix one compartment, fix APEX



So, how should we select the best operation for prolapse repair?

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



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



- Understand each woman's symptoms and treatment goals
- Select surgical procedure that optimizes those goals anatomically and functionally

Goals for POP Surgery



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

ICS Barcelona 2013

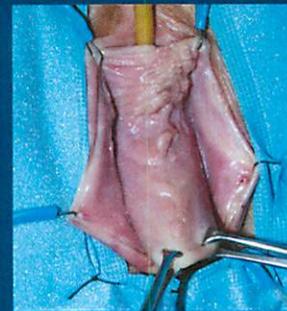
“Traditional repairs vs Augmented repairs”

- 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.....

Challenges in Vaginal Prolapse Surgery

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

Anterior Vaginal Wall Prolapse

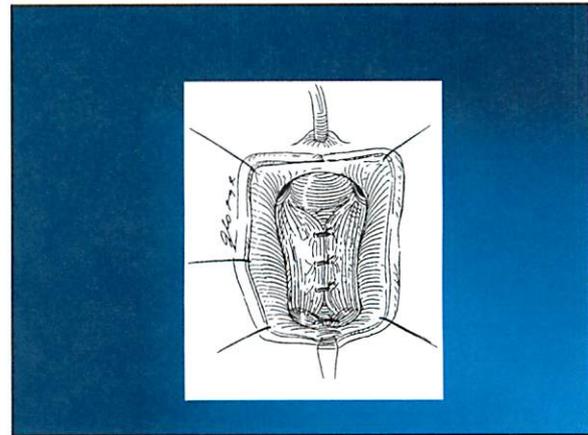
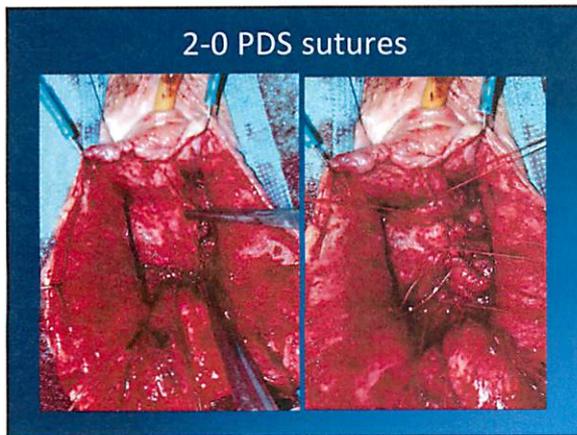
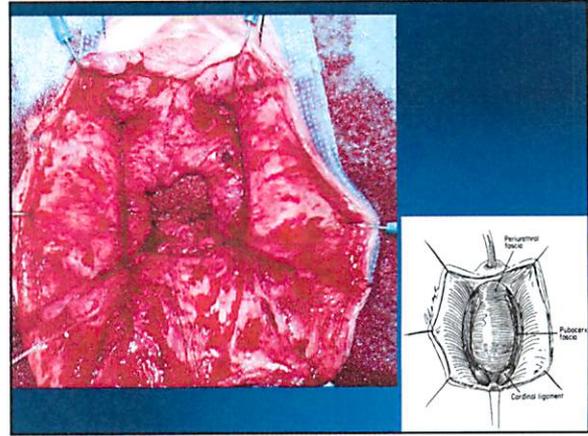
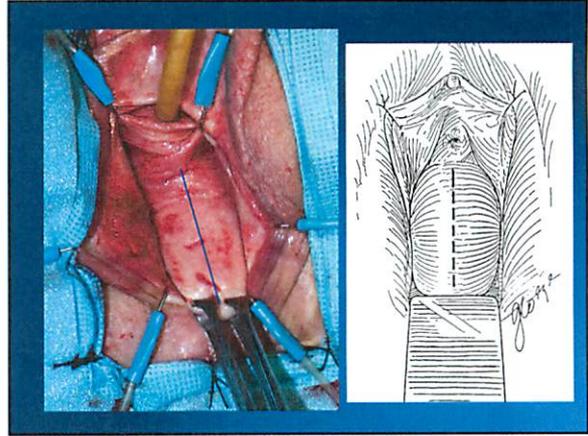
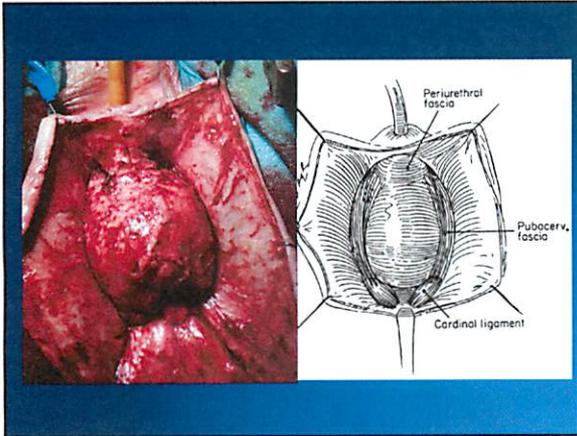


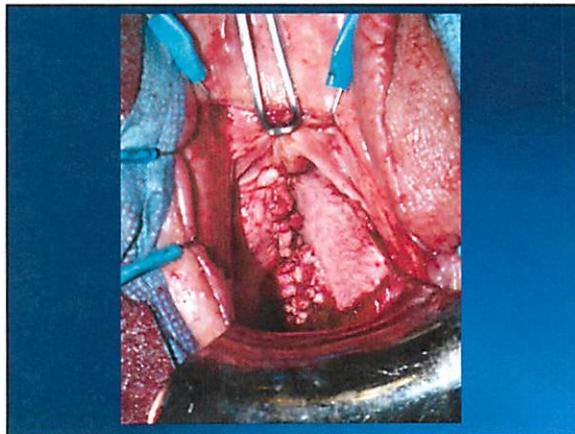
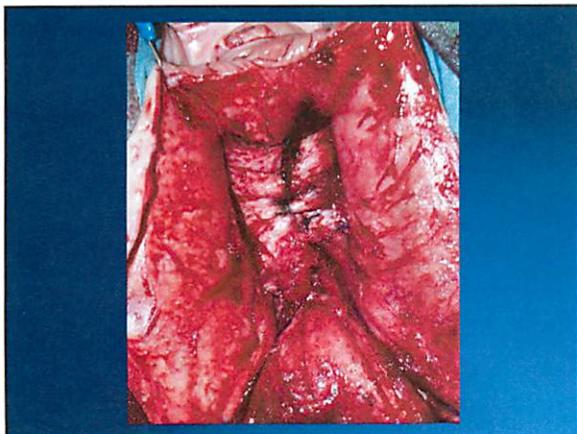
Four Defects of Anterior Vaginal Wall Prolapse

- 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

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 selectively address potential urethral incompetence (OPUS Trial Data 2012)





Traditional Cystocele Repair

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

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

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.

Vaginal Vault Suspensions

Apical Prolapse

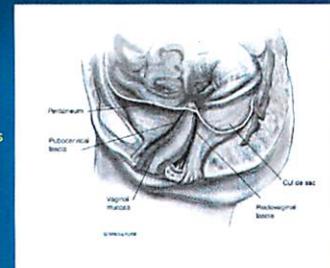


Objectives of Vaginal Vault Surgery

- 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

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



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

Transvaginal Procedures for Vaginal Vault Prolapse

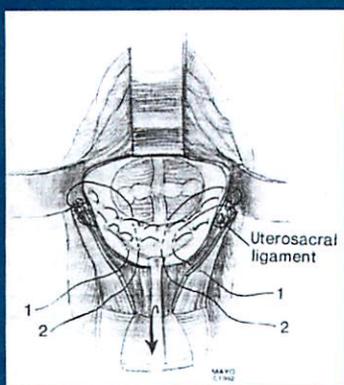
- Modified McCall's Culdoplasty
- Iliococcygeus Vaginal Vault Suspension
- Levator Myorrhaphy
- Sacrospinous Ligament Fixation (SSLF)
- High Uterosacral Vaginal Vault Suspension (USVVS)
- Total Vaginal Mesh Apical Suspension
- Colpocleisis

Abdominal Repairs for Vaginal Vault Prolapse

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

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



Mayo Culdoplasty

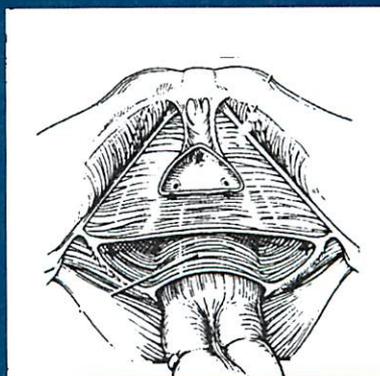
- 660 patients, posthysterectomy vault prolapse (TVH - 43%, TAH - 49%)
- questionnaire and/or telephone contact
- follow-up 11-22 yrs.
- satisfaction - 82%
- complications: bladder/bowel entry (2.3%), ureteral damage (0.6%), hematoma (1.3%)
- subsequent repairs - 5.2% none - 71%
- "bulge" - 11.5% none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

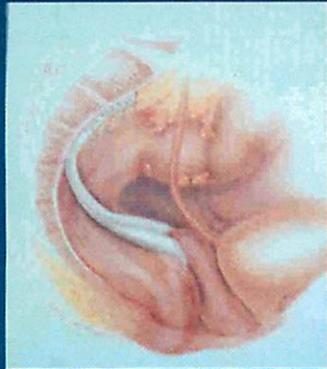
Webb, Aronson, Ferguson, Lee. *Obstet Gynecol* 1998;92:281-5.

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.





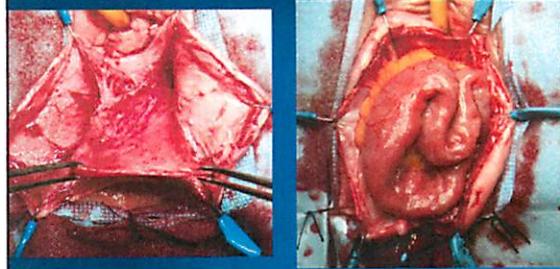
Levator Myorrhaphy

- 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

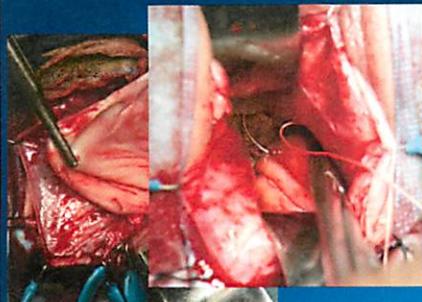
Levator Myorrhaphy



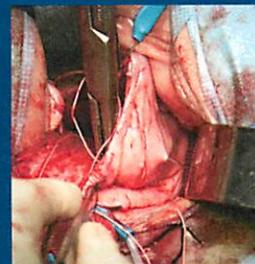
Exposing peritoneal sac



Vault suspension sutures



Out of peritoneal sac 1 cm from original entrance



Purse string sutures Pre-rectal



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

Sacrospinous Ligament Fixation

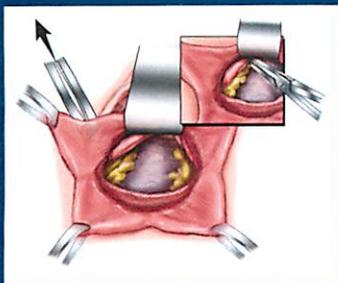
- Objective success 73-97%
- Various definitions of success
- Sites of failure often not specified
- Prospective trials:
 - ASC vs SSLF
 - Abd better (Benson)
 - Maher (equivalent)



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

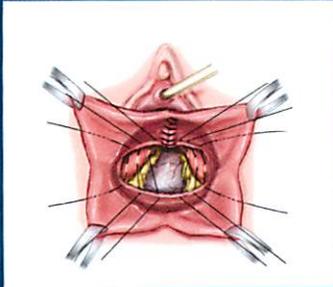
Uterosacral Vaginal Vault Suspension



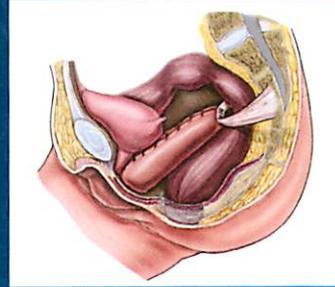
Uterosacral Vaginal Vault Suspension



Uterosacral VVS



Uterosacral VVS



Uterosacral VVS Results

First Author	Year	No.	Follow up (Months range)	Definition of anatomic success	Anatomic success all segments	Anatomic recurrence by segment	Retention for P-P
Jenkins	1997	50	6-48	Not defined	90%	Anterior 4%	None reported
Comisar	1999	100	17 (15-35)	Grade 0-1	96%	Apical only 4%	4 (4%)
Harber	2001	46	18.8 (3-54)	Stage 0-1 or asymptomatic Stage 2	90%	Apex 0% Anterior 3% Posterior 3%	1 (2%)
Karram	2001	168	21.6 (1-76)	Grade 0-1	88%	Apex 0% Anterior 13% Posterior 10%	11 (6.5%)
Shull	2004	289	Not stated	Grade 0-1	95%	Apex 0% Anterior 3% Posterior 1.4%	None reported
Amundsen	2005	31	28 (1-43)	Stage 0-1	82%	Apex 0% Distal 12%	None reported

Optimal Trial

- Goal: Compare SSLF and USVVS and perioperative PFMT
- 374 women randomized between 2008 and 2013
- Follow up for 2 years (84.5% completed)
- Primary Outcome:
 - no apical descent greater than 1/3 into vaginal canal or a/p descent beyond hymen
 - No bothersome bulge symptoms
 - No need for retreatment
- Results: SSLF 60.5% vs USVVS 59.2%, PFMT no changes in scores in UI, Prolapse or anatomic

Posterior Compartment Repairs

Posterior Wall Prolapse

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

Rectocele repairs when to do ?

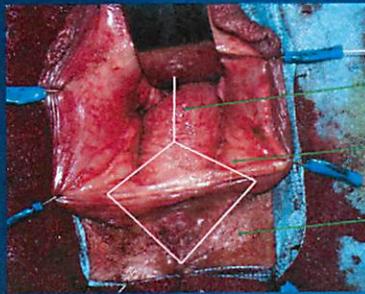
- **Symptomatic**
 - Defecatory dysfunction
 - Digitation
 - Symptomatic bulge
- **Asymptomatic: caution....**
 - Size ??
 - Risks and benefits ?
 - Pain
 - Dyspareunia
- **How about at time of sacrocolpopexy ?**

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

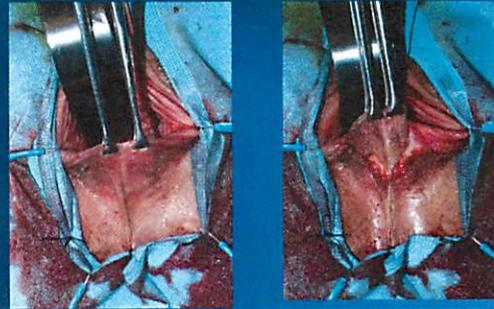
** one need not do all of these in all patients **

Pelvic floor repair

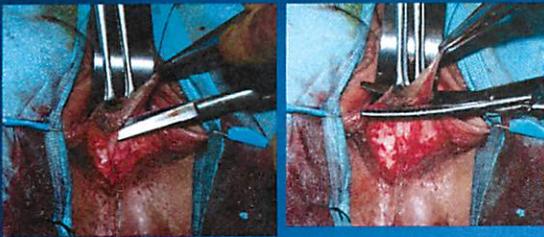


- 3) Pre rectal incision
- 2) Vaginal triangle
- 1) Perineal triangle

Perineal incision



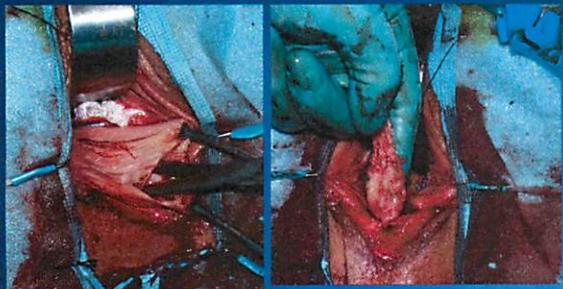
Dissection and excision



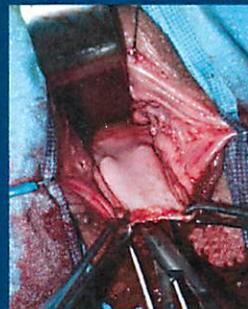
Posterior vaginal triangle



Dissect and excise posterior triangle



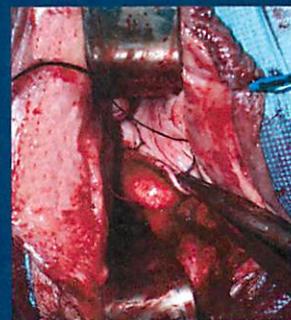
Dissection and excision posterior vaginal wall



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

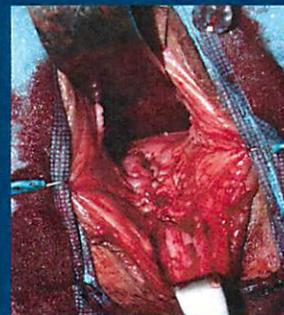
Inclusion of Pararectal and Prerectal fascia

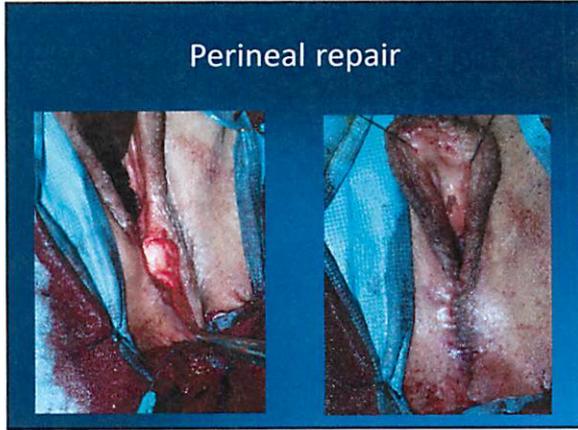
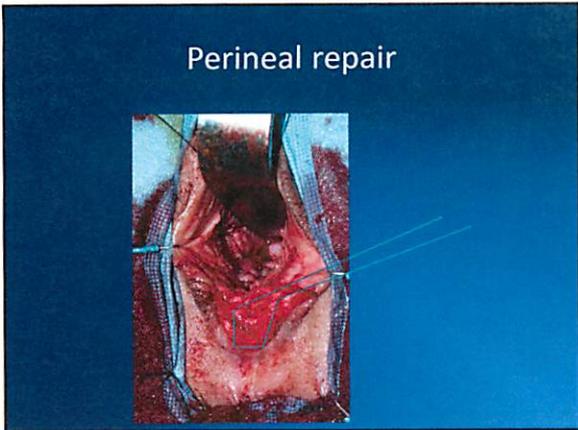


Pelvic Floor Repair
Steps as Necessary

- *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

Re-approximation of levator hiatus





Standard Posterior Colporraphy

Study	N	Mean Follow-up (mo)	Anatomic Cure (%)	Vaginal Digitation (%)	Defecatory Dysfunction (%)	Fecal Incontinence (%)	Dyspareunia (%)	De novo Dyspareunia in Sexually Active Patients, n (%)
Melgren et al	25	12	96	30	100	8		2 (8)
Preoperative	25			0	88	8		
Postoperative								
Weber et al	53	12						14 (26)
Preoperative	53							
Postoperative								
Sand et al*	70	12	90					
Preoperative	70							
Postoperative								
Maher et al	38	12.5	89	100	100	3	37	1 (4)
Preoperative	38			100	13	0	5	
Postoperative								
Paraso et al†	37	17.5	86	4	80		56	20
Preoperative	37			4	32		45	
Postoperative								

* Prospective studies only.
† Randomized controlled trial.

Site Specific Repairs

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

* Retrospective studies, † randomized and prospective.

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 (%)
Milam et al	63		94	Prolene	45		4 (6)	13
Preoperative					30			
Postoperative								
Altman et al	32	38	62	Acellular porcine dermis (Pelvicol)	100			
Preoperative								
Postoperative								
Sand et al†	23				< 50			
Preoperative	73	12	92	Polyglactin				
Postoperative	65							
Paraso et al†	31	17.5	54	Acellular porcine small intestinal Submucosa (Fortagen)	97	51		
Preoperative								
Postoperative	26				21	7	(6)	

* Prospective studies only.
† Randomized controlled trial.

- ### 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

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NU PELVIC HEALTH & RECONSTRUCTIVE GROUP



LSC vs Robotic ASC

Paraiso, 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
 N=78 (R 40, L 38) SCH (60%) vault

- Robotics Longer (21 mins, p<0.03)

Minimally Invasive ASC

Laparoscopic vs Robotic ASC: 1 RCT

- Anatomic & functional outcomes similar
- Robotic
 - Longer OR time
 - ↑ post-operative pain

Paraiso M et al 2010

Expert Opinions – 4 Important Tips
 Nygaard J, Obstet Gynecol 2004;104:805-23

- 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

Open vs Robotic ASC

Case-series

N=178: 73 robot & 105 open	• N=28: 89%, 1-year follow-up
- 6-weeks	- Validated Measures
- Anatomic outcomes good and similar (POP-Q)	- Pelvic floor symptoms improved
- Robotic	- Sexual function improved
• Longer OR times	- 100 % anatomic cure
• Less blood loss	
• Shorter hospital stay	

Geller E et al 2008, 2011

Positioning: Steep Trendelenburg

- Keep bowels out of pelvis
- Access pre-sacral space
 - Low bed
 - Trendelenburg
 - Slippage
 - Stirrups



Trendelenburg

- Remember that patient may slide towards head of bed
- 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



Patient Positioning

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



Positioning

- 2 Options
 - Shoulder Pads



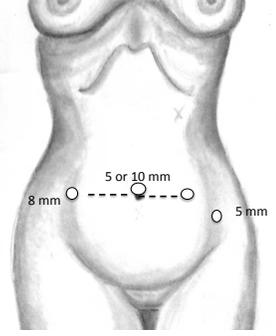
Positioning

Hug U Vac



Port Placement

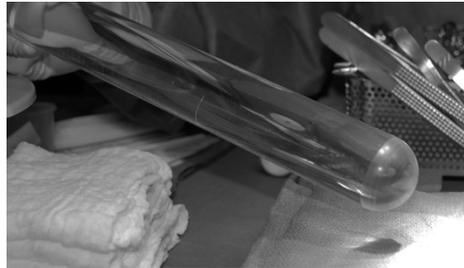
- 8 mm accessory port
 - Pass suture
- 2, 5 mm ports
 - Sewing
- 5 mm umbilical port
 - 10 mm if morcellating



Positioning: Low-rise stir-ups



Lucite Stent



Soft Polypropylene Mesh



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

Below Promontory

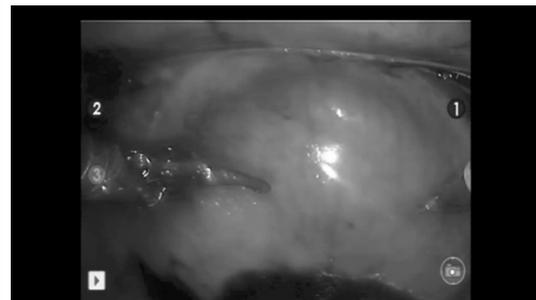


- 73 MRIs**
- **73%** - Disc
 - **27%** - Superior S1

Pre-Sacral Dissection



Posterior Dissection



Sewing Mesh

Fixing Mesh to Sacrum

Lessons Learned

- Minimal mesh (dose effect)
- Fixation of mesh
 - **2 separate pieces**
 - **Posterior first**
- Don't over-correct anterior wall - "loose"
- Evaluate pre-sacral space early
- Lyse most adhesions after docking robot

Thank you for your attention!



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 POP¹. 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%².

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. The number of series reported in the literature has gradually increased over the past 2-3 years and the follow-up has moved from short to mid-term data. Long-term data is still awaited.

In addition, one systematic review and meta-analysis of comparative study was recently published in European Urology³ and concluded that "From the findings available in the literature, robotic assisted mesh sacrocolpopexy (RASC) seems to be an efficient and reliable surgical option to repair apical vaginal prolapse with few intra- and post-operative complications". In one study randomizing between laparoscopy and robotic approaches⁴, RASC was found to be more costly because of purchase costs and robot maintenance. The results at 6 months were similar in both groups.

We will present our current technique by video and have included a step-by-step description of this procedure.⁵ Key features include side-docking, use of a marlex-type mesh, pre-placed absorbable sutures over a Y-shaped mesh, cervical preservation when indicated, minimal tensioning, retroperitonealization of the mesh, and cystoscopy at the end.

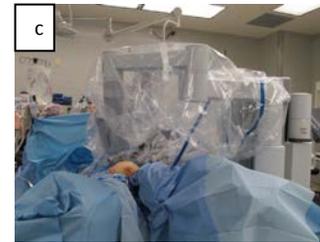
RASC Technique

The RASC is performed using the da Vinci® robot (a). This system utilizes two robotic arms on the left, a camera arm at or above the umbilicus, and, on the right side, a fourth robotic arm and an assistant port. We have done several single-incision (SILS) RASC but these cases are very challenging and should be considered very selectively. The video on SILS is available upon request.



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 Tredeburg position (b), the camera is inserted through a 12 mm port at the umbilicus, with the robotic arms

inserted following a "W" shape configuration as previously described⁶. An assistant port is placed laterally on the right side, for a total of 5 ports.

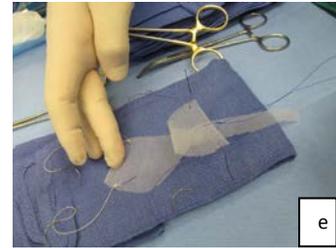


Docking the robot was done initially at the foot of the bed, however more recently we have evolved to docking from the side in order to maintain access to the vagina (c). Any abdominal adhesions are taken down as necessary to free the pelvic cavity (d). At this point small

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 just 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

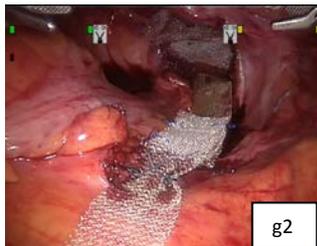
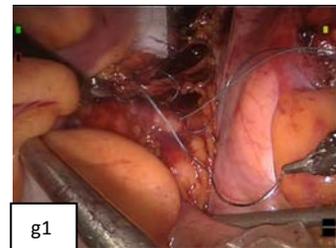


measured, trimmed and secured with 2-0 polyglactin sutures at each extremity (e). The prepared mesh is



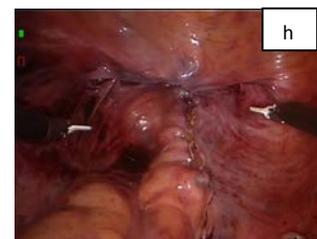
introduced into the abdomen through the assistant port. The mesh is secured as distally as possible over the posterior vaginal wall with the preplaced absorbable sutures (f). Additional sutures are placed more proximally and bilaterally over the posterior vaginal wall near the vaginal apex. Because these 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 (g 1 and 2). 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 (h). 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.

References

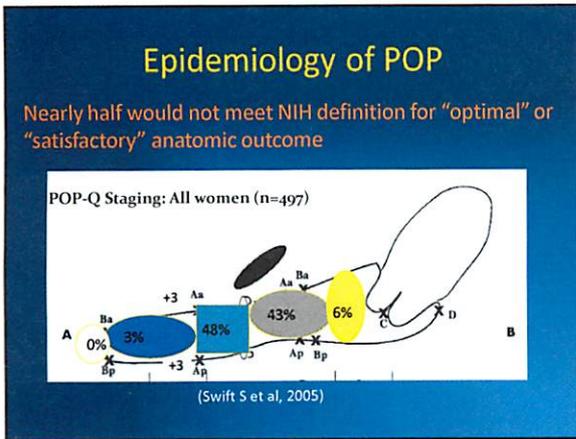
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Assessment of Outcomes of Prolapse Repairs

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Outcomes Assessment

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



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

What is a failure after Prolapse surgery?

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

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%)

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*

Outcomes Assessment

- Anatomy: should use POP-Q and hymen as threshold for success
- Subjective: absence of vaginal bulge
- Functional: condition specific HRQOL instruments
- Sexual Function: validated prolapse specific (PISQ) or FSFI
- Assess repeat surgery/treatments, baseline pain and sexual function

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