



Vaginal Surgery. Is apical support always necessary at the time of anterior repair?

Workshop 16

Monday 23 August 2010, 14:00 – 17:00

Time	Time	Topic	Speaker
14:00	14:10	Introduction, background information	Renaud de Tayrac
14:10	14:40	Functional anatomy of the anterior & apical vaginal compartment	Kindra Larson
14:40	15:00	Vaginal surgery with no mesh: is apical support always necessary at the time of anterior repair?	Michele Meschia
15:00	15:20	Review of the different techniques for apical support: high uterosacral ligament vault suspension, sacrospinous suspension, transischioanal tape or posterior mesh?	Michelle Fynes
15:20	15:30	Q&A	
15:30	16:00	Break	
16:00	16:20	Vaginal surgery with mesh: is apical support always necessary at the time of anterior repair?	Brigitte Fatton
16:20	16:40	Concomitant anterior mesh and anterior sacrospinous suspension: rational and US experience	Roger Goldberg
16:40	16:50	Q&A	
16:50	17:00	Take home messages	Renaud de Tayrac

Aims of course/workshop

Many mesh kits are currently available for anterior repair: anterior mesh, total mesh and anterior mesh with anterior sacrospinous fixation.

Main objectives of that workshop are to determine if apical support is always necessary at the time of anterior mesh repair and in which indications we should use the sole anterior mesh, a total mesh or an anterior mesh with concomitant anterior sacrospinous suspension.

Educational Objectives

Although anatomical studies have shown that apical support is critical to cystocele (DeLancey JO. Am J Obstet Gynecol. 2002;187:93-8), and although the use of mesh for anterior repair has been shown superior to traditional repairs, there is currently limited evidence about the need of apical support at the time of anterior repair with or without mesh.

Functional Anatomy of the Anterior and Apical Compartments

Kimbra Larson, MD
ICS-IUGA 2010

Pelvic Floor Research Group
Department of Obstetrics and Gynecology
University of Michigan, Ann Arbor, MI
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What's wrong?

Central Defect
Paravaginal Defect

What do you think causes a cystocele?

Are all cystoceles the same?

© DeLancey

Elevating apex reduces cystocele

© DeLancey

Ode to a Cystocele

by
John O. L. DeLancey

Poor cystocele, you're sitting there
Between the bladder and the air
Bulging out from where you hide
Ashamed they'll see your wounded pride.

Misunderstood, neglected too
You've cringed when science leered at you
Passed-by along the road to fame
You're destiny seemed filled with shame.

But now you're modeled -- spun around
Shown off in 3D shows with sound;
On video you're gaining fame
Soon all will think you're not the same.

So cystocele please don't despair
Your unjust burden bravely bear
For though your cause is still conjecture
At least you have this fall lecture.

© DeLancey Inspired by Ode to the Urethra
Fritz C. Westerhout, Jr. MD

2-D MR imaging

3-D Models

Tools to unravel the mystery of the cystocele

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Pelvic Floor Research Group
Improving prevention and treatment of women's pelvic floor disorders

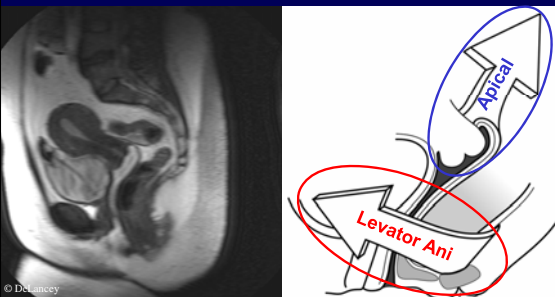


Gynecologists, Engineers, Nurses, Physiologists,
Midwives, Urologists, Radiologists, Physiatrists, Statisticians,
Epidemiologists, Health Services Researchers, Economists,
Endocrinologists, Physical Therapists, Cell Biologists, Veterinarians

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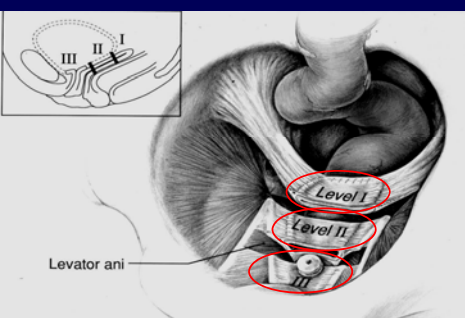
What is normal support?

Principal Elements of Pelvic Organ Support



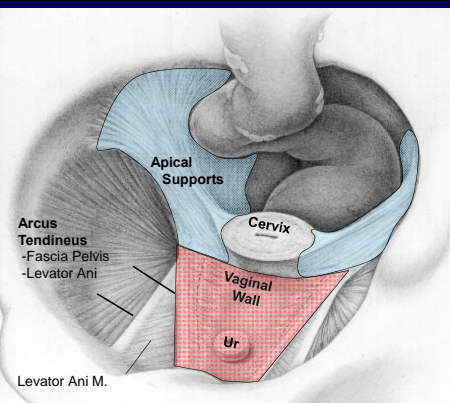
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Those infamous "Levels"



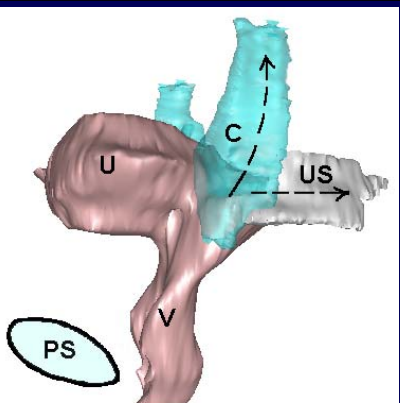
Levator ani

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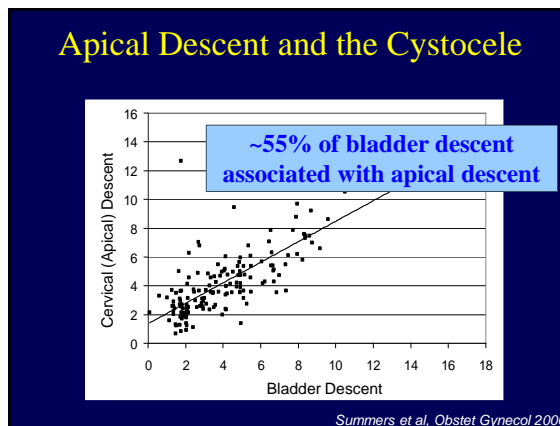
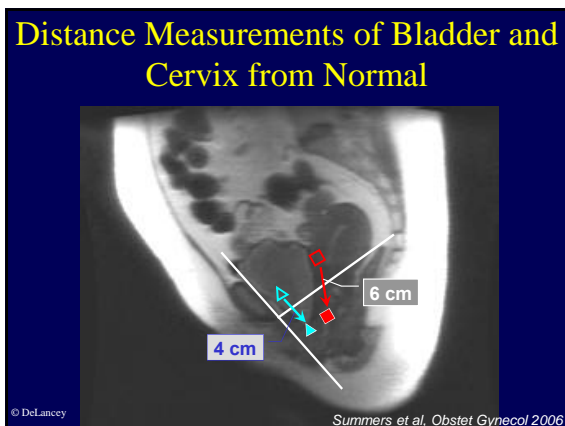
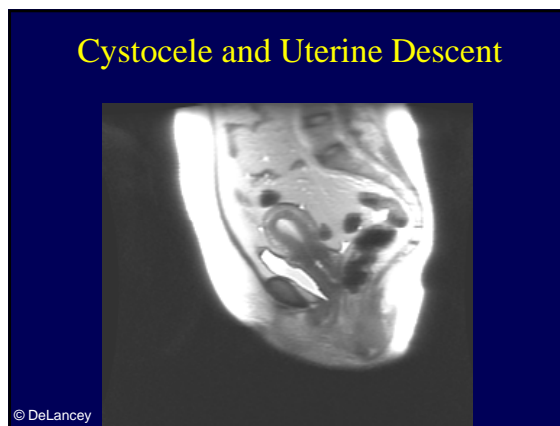
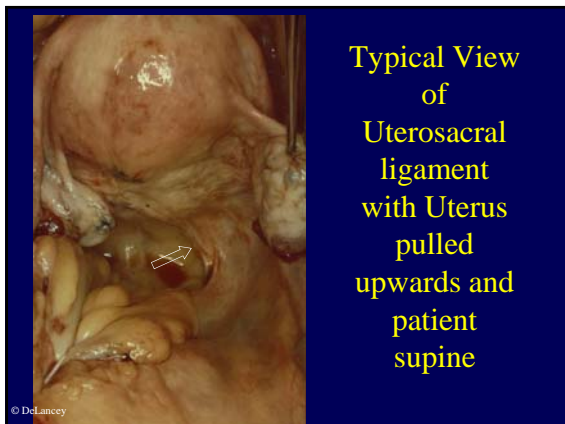
Apical Supports
Cervix
Vaginal Wall
Ur
Levator Ani M.
Arcus Tendineus
Fascia Pelvis
Levator Ani

Courtesy DeLancey

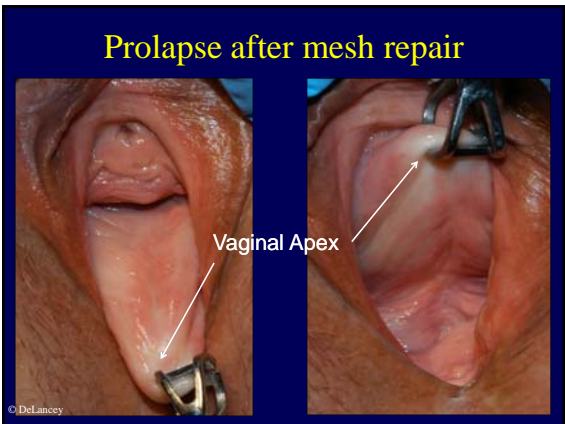


U
C
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PS

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Does this fit with clinical observations?

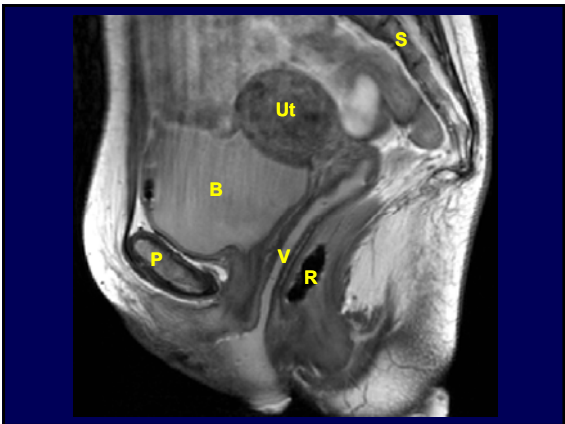


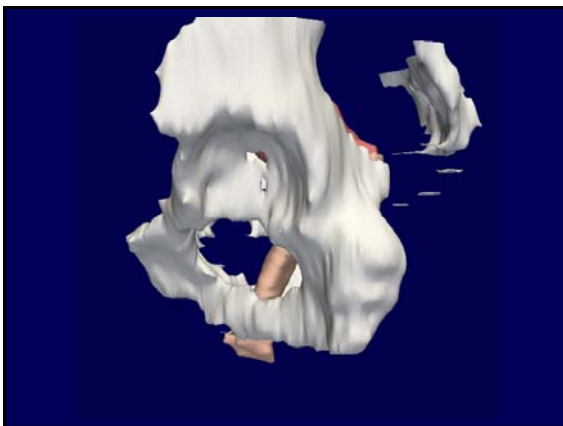
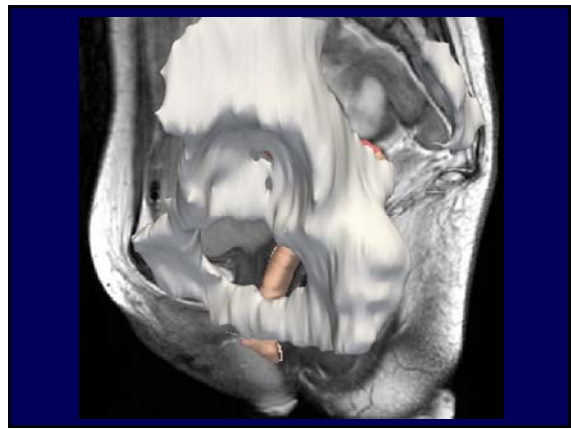
Methods

- Study population:
 - 11 asymptomatic women
 - Normal support (POP-Q points ≥ 1 cm above the hymen)
- Magnetic resonance imaging
- 3D models

Larson KA, Hsu Y, DeLancey JO. The relationship between superior attachment points for anterior wall mesh operations and the upper vagina using a 3-dimensional magnetic resonance model in women with normal support. Am J Obstet Gynecol. 2009 May;200(5):554.e1-6. Epub 2009 Jan 24.

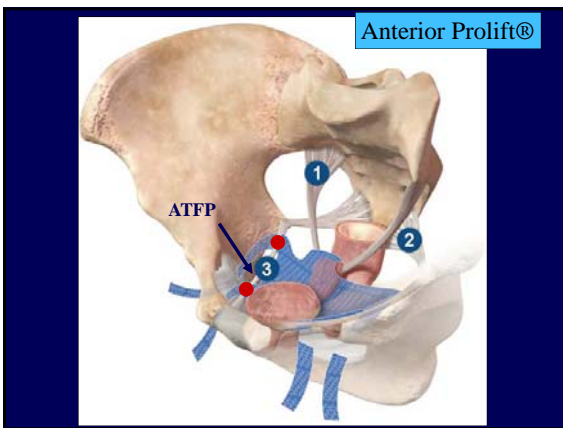
How do we make a 3D model?



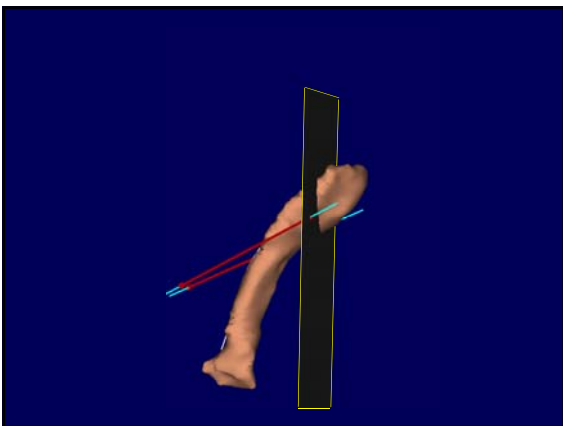
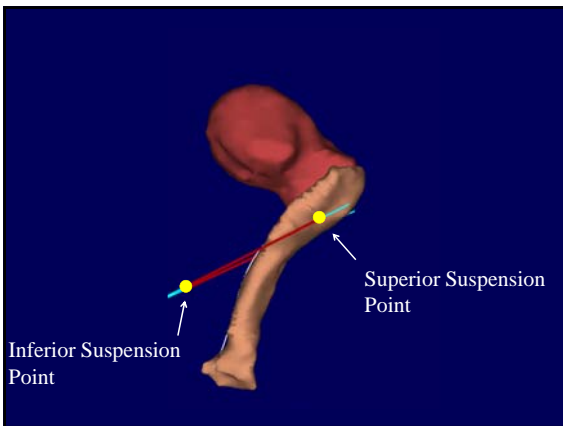


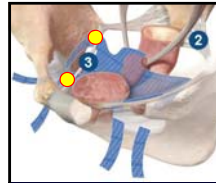
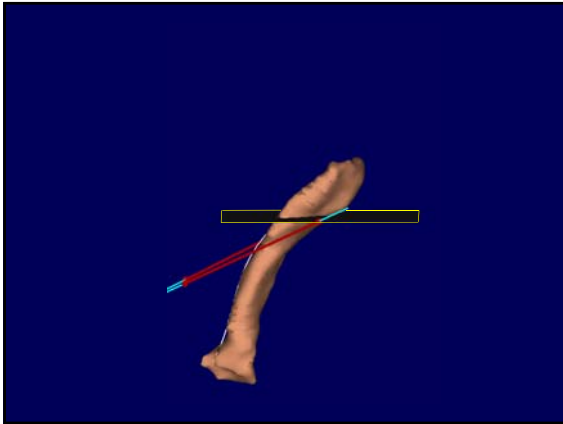


Where do the manufacturer's recommend placement of these kits?



Anterior Kits	Anchoring Site	
	Superior	Inferior
Perigee®	2 cm from spine	Level of bladder neck
Anterior Prolift®	1 cm from spine	1 cm from the pubic arch
Anterior Avaulta®	"at ischial spine"	Level of bladder neck
Model Assumption	1.5 cm from spine	Level of bladder neck





Rest:

Above: 11/11 subjects
40% of vaginal length (SD 14%)

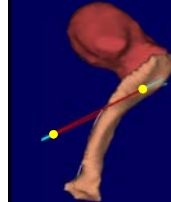
Behind: 9/11 subjects
15% of vaginal length (SD 6%)

Valsalva:

Above: 8/11 subjects
29% of vaginal length (SD 12%)

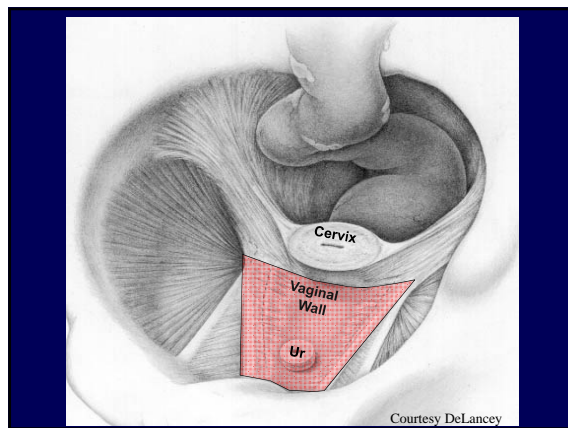
Behind: 11/11 subjects
24% of vaginal length (SD 24%)

Change: Mesh kits may not be appropriate for patients with significant apical prolapse

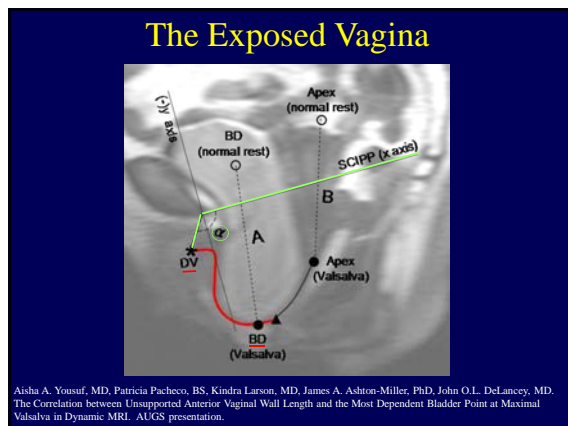
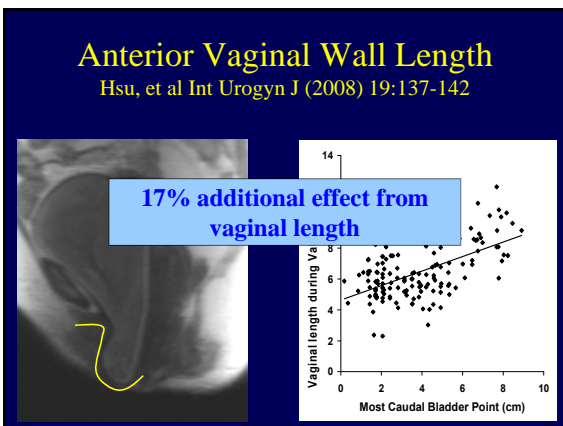


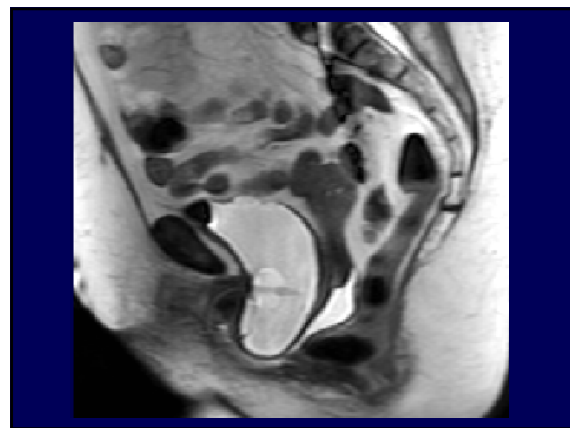
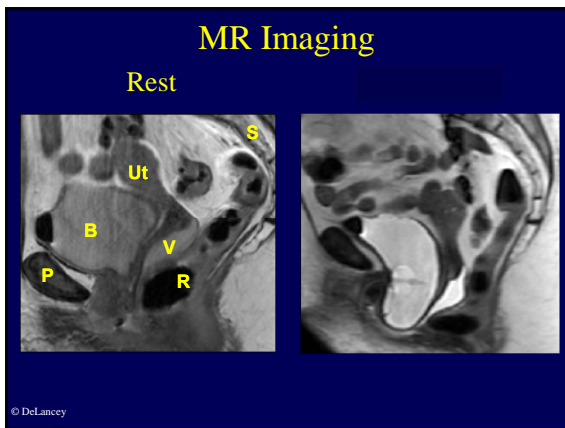
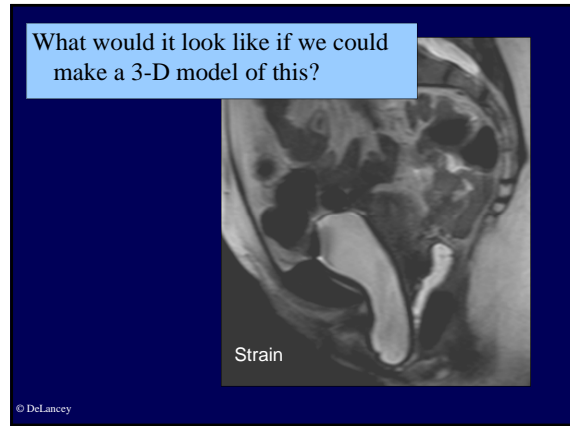
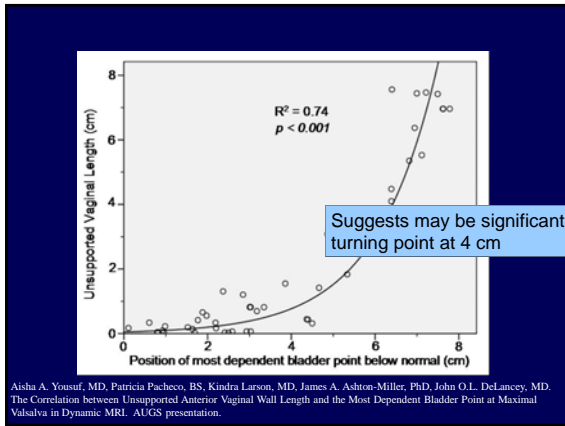
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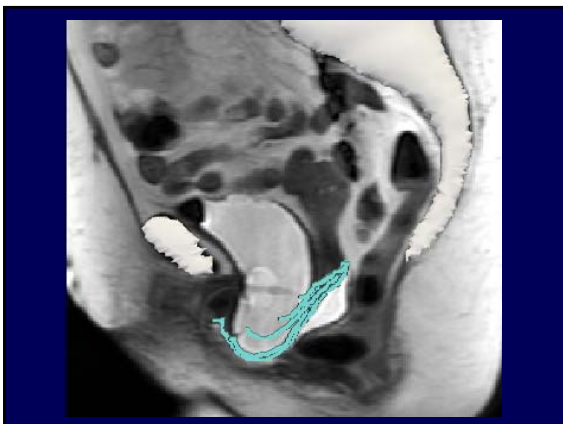
But it isn't all about the apex, is it?



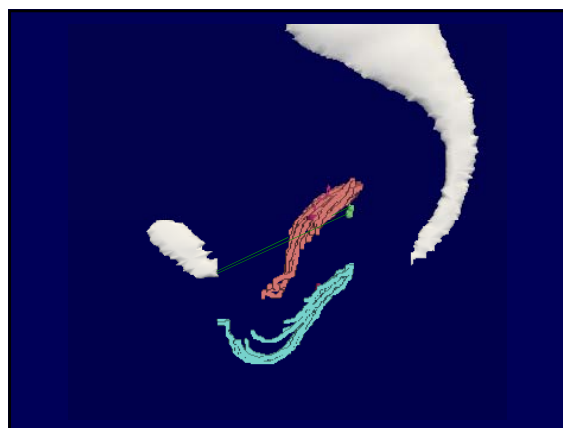
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- ### Methods
- Study population
 - 10 women with a cystocele ≥ 1 cm beyond the hymen
 - 10 women with normal support (controls)
 - MR imaging
 - 3-D models

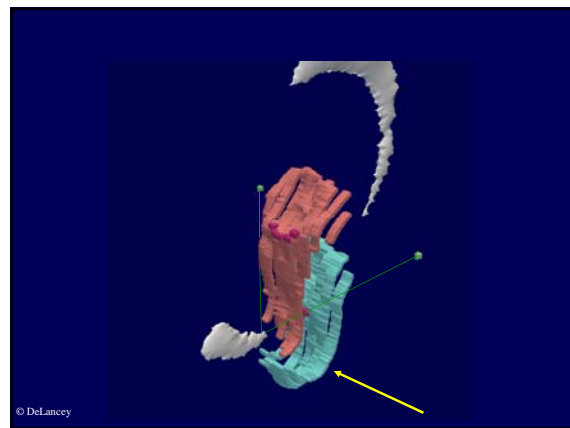
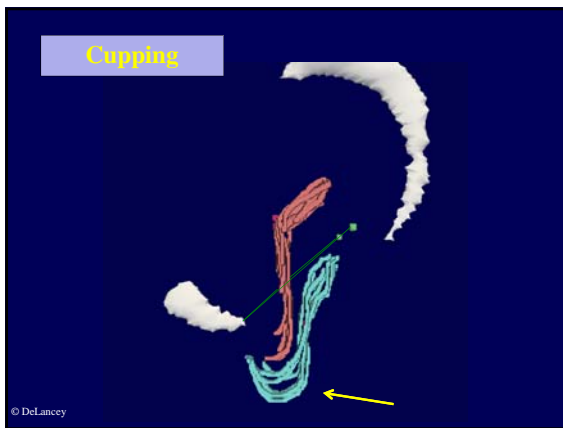
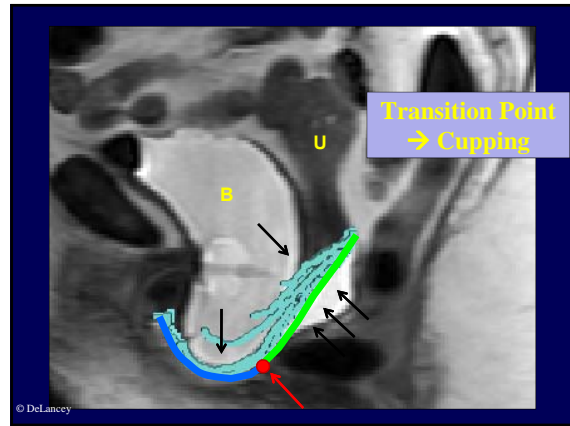
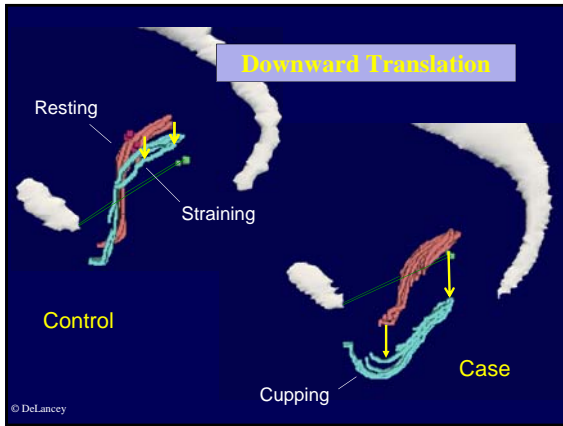


Characteristics	Cases (n=10)	Controls (n=10)	P-value
Age (yrs)*	56.3 \pm 6.7	62.9 \pm 13.1	0.17
BMI (kg/m2)*	27.2 \pm 4.4	25.2 \pm 4.5	0.32
Median parity	2	3	0.49
POP-Q*			
Aa	1.5 \pm 1.0	-1.7 \pm 0.9	0.0001
Ba	2.2 \pm 1.6	-1.6 \pm 1.0	0.0001
C	-3.2 \pm 1.6	-6.0 \pm 1.1	0.0002
D	-6.6 \pm 1.1	-8.9 \pm 1.1	0.0001

* Data are mean \pm SD unless otherwise specified

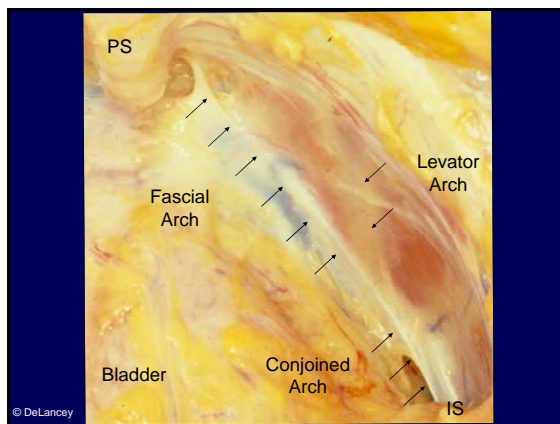
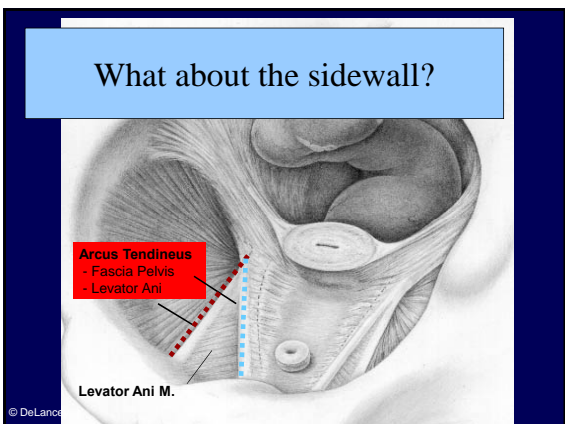
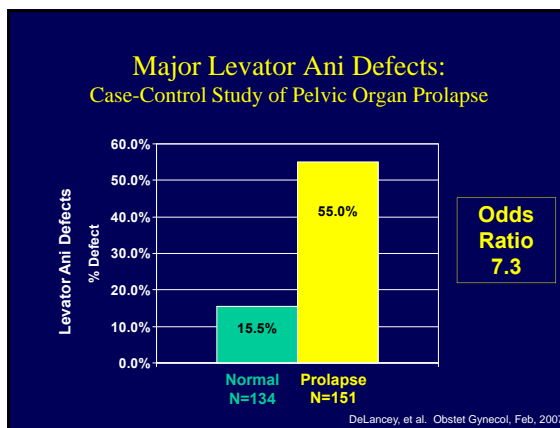
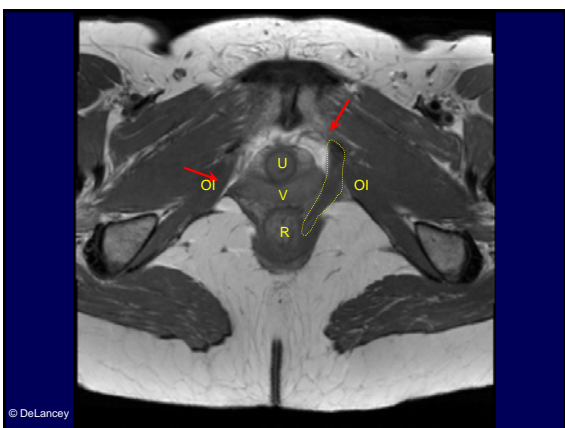
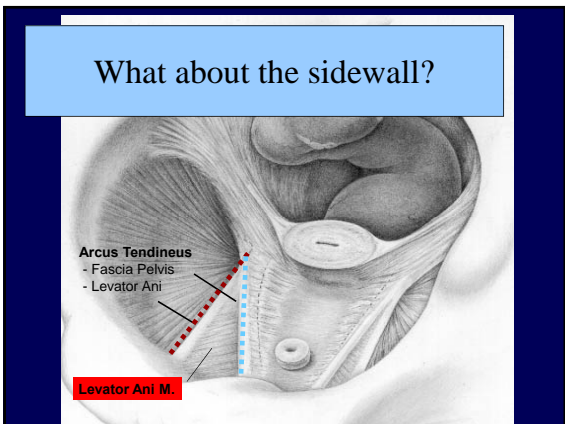
- ### 3 Cardinal Features
- Downward Translation
 - Vaginal Cupping
 - Distal Pivot

Larson et al, Int Urogynecol J Pelvic Floor Dysfunct. In press



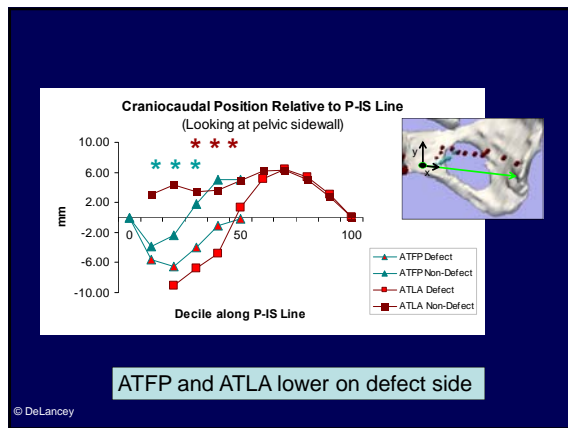
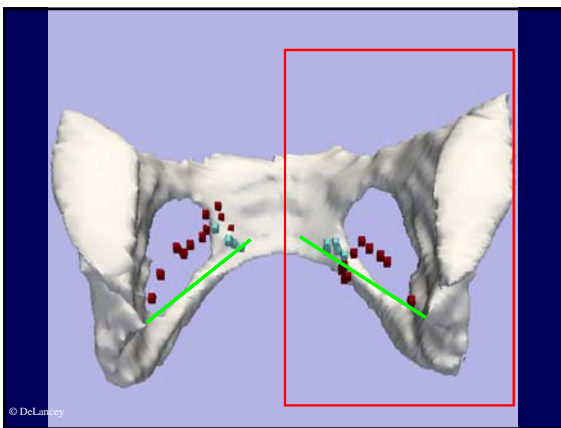
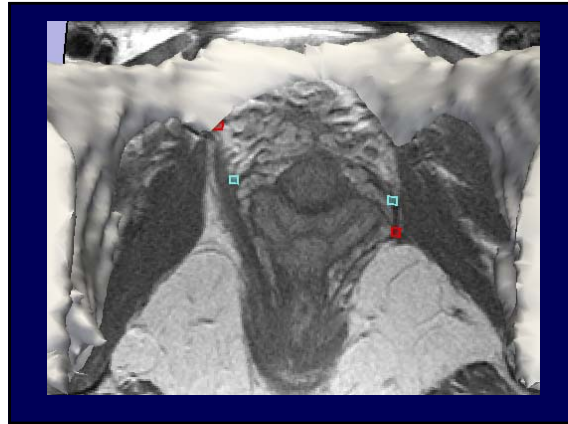
But what can we do with this information?

- Quantification
- Quantification
- Quantification



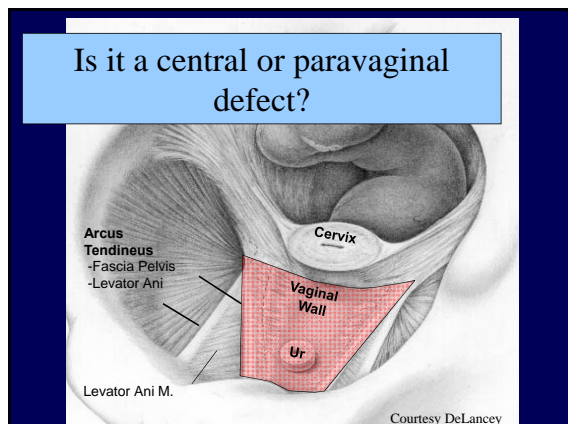
Methods

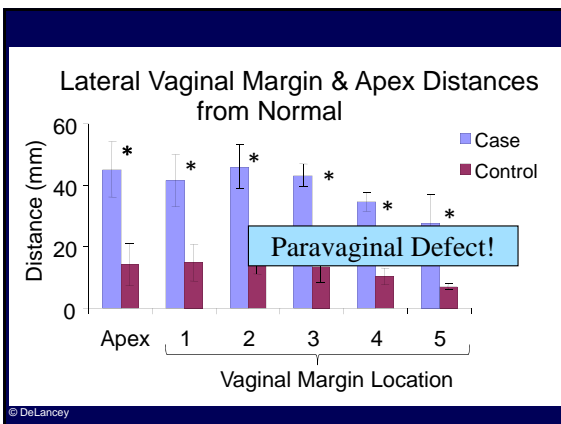
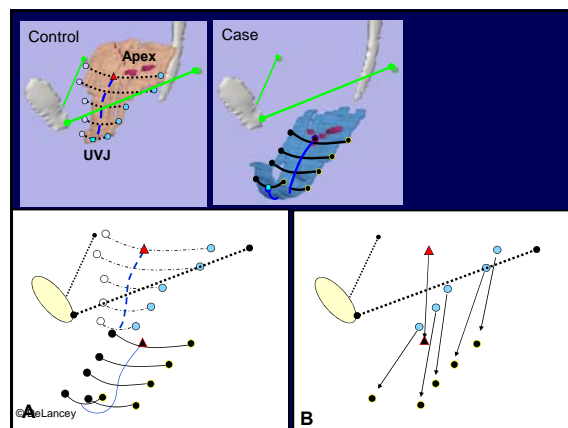
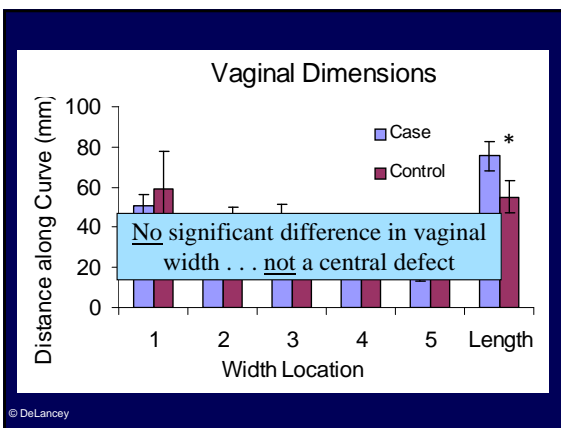
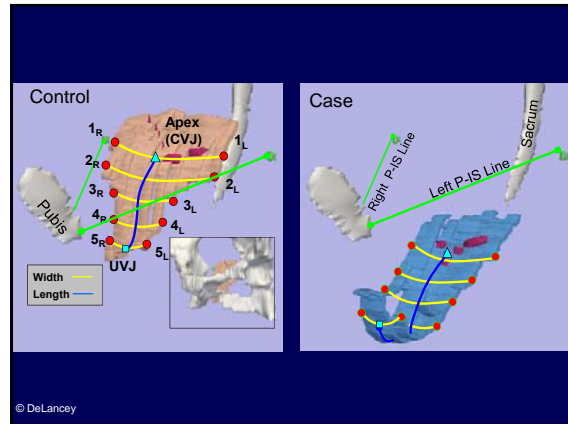
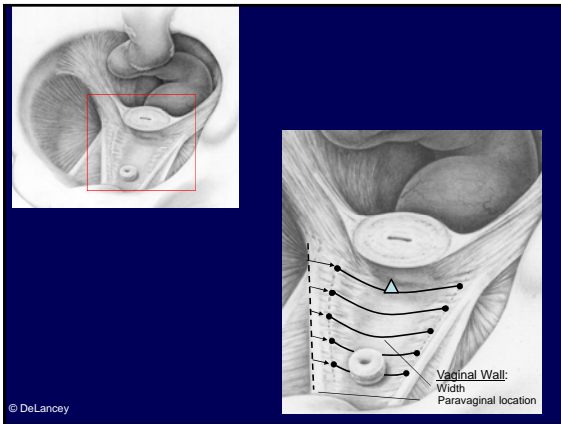
- Study population: 14 women with unilateral levator defects
- MR imaging
- 3-D models
- Quantify using local coordinate systems!



Key paravaginal structures are in a different location in women with levator defects

- The ATLA extends lower (more caudally)
- The ATFP extends lower (more caudally)
- Fits with **paravaginal defect concept** – a breaking away from the pelvic sidewall (down, medial, away from pubic bone)





Clinical importance: "So what?"

- Re-suspending the apex is important in certain cystoceles
 - Apical support important to cure of cystocele (i.e. Vaginal Hysterectomy)
- Excess length of the anterior vaginal wall should be considered in surgical management
- Anterior repair restores normal vaginal length
- The vagina does seem to break away from the side wall

How to you really know what's
cause and effect?

Create a lesion and see what
happens?

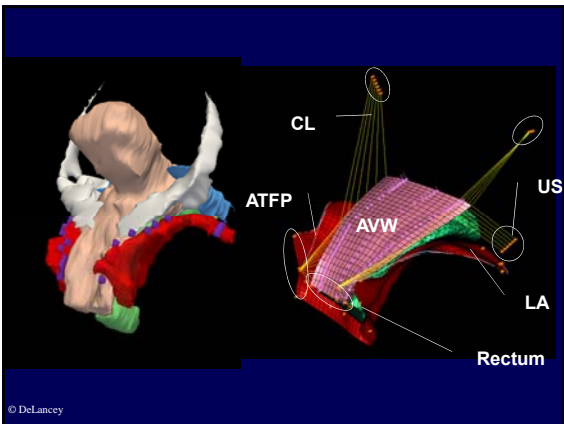
Volunteers?

**3D Finite Element Model of
Anterior Vaginal Wall**

Luyun Chen, Ph. D
James Ashton-Miller, Ph. D
Yvonne Hsu, MD
J.O.L DeLancey, MD

First Place: Journal of Biomechanics Award 2008

Chen L, Ashton-Miller JA, DeLancey JO. A 3D finite element model of anterior vaginal wall support to evaluate mechanisms underlying cystocele formation. J Biomech. 2009 Jul 22;42(10):1371-7. Epub 2009 May 29.



Vaginal surgery with no mesh: is apical support always necessary at the time of anterior repair?

Michele Meschia, Italy

Successful treatment of anterior vaginal prolapse remains one of the most challenging aspects of pelvic reconstructive surgery. Anterior repair has been for decades the standard surgical procedure for anterior vaginal wall prolapse although it has been documented that recurrences may be as high as 40-50% of treated cases.

However it is disappointing to note how heterogeneous are data on this regard including case series where anterior repair was performed with or without other additional reconstructive procedures, making difficult to draw any sound conclusion regarding the role of the anterior repair in the management of anterior vaginal prolapse and associated pelvic floor defects.

Critical for the maintenance of anterior vaginal support is to ensure an adequate support (at the level of the ischial spines) for the apical vaginal site (cervix-cuff and culd-de-sac).

It has been demonstrated that women with anterior vaginal wall descent had quite universally a posterior detachment of the arcus tendineus fascia pelvis (ATFP) from the ischial spines allowing the vagina to swing caudally (1).

The relationships between the anterior and apical vaginal compartments have been clearly demonstrated with figures that show that almost 80% and 55% of women with anterior vaginal prolapse at least 2 cm outside the hymen had a descent of the apical segment to at least 2 cm inside the hymen and > 2 cm outside the hymen respectively (2). The authors concluded that recurrent prolapse might be partially due to a modifiable factor, which is a failure to diagnose and treat apical support defects.

Richardson et al (3) focused on site specific defects of the endopelvic fascia showing that a transverse cystocele represent a detachment of the pubocervical fascia from the cervix

or apex, which results in the bladder herniating beneath the anterior vaginal fornix. Surgical repairs of transverse defects must include reattachment of the upper endopelvic fascia to the pubocervical fascia therefore as more than 80% of patients have multiple defects of the endopelvic fascia an apical prolapse repair procedure has to be accomplished in the majority of patients with a predominant anterior vaginal prolapse.

Different vaginal procedures without using a synthetic graft have been used to adequately suspend the apical compartment at the time of anterior vaginal repair including the uterosacral ligament suspension, the sacrospinous ligament suspension, the ilio-coccygeus fixation or the high levator myorrhaphy. All the procedures can be accomplished at the time of vaginal hysterectomy or can be scheduled for the treatment of a coexistent cuff prolapse or cervix descent.

1. DeLancey JOL. Fascial and muscular abnormalities in women with urethral hypermobility and anterior vaginal wall prolapse. *Am J Obstet Gynecol* 2002; 187:93-8
2. Rooney K, Kenton K, Mueller E et al Advanced anterior vaginal wall prolapse is highly correlated with apical prolapse
3. Richardson AC, Lyon JB, Williams NL. A new look at pelvic relaxation. *Am J Obstet Gynecol* 1976; 126:568-73



Vaginal Cystocele Repair: Correcting concomitant Apical Descent

Miss Michelle M Fynes MD MRCOG DU
Lead Consultant Urogynaecologist & Honorary Senior Lecturer

*Pelvic Reconstruction & Urogynaecology Unit
Department of Obstetrics & Gynaecology
St. George's Hospital
University of London Medical School*



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Objectives

- Review of the different techniques for vaginal restoration of apical support:
- Historical perspective
 - High uterosacral ligament vault suspension,
 - Sacrospinous and iliococcygeus fixation
 - Colpocleisis/ colpectomy
 - Trans-ischioanal tape - Mesh Kits
 - Posterior mesh

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Cystocele



Analysis of 'Well women' population

- For women who entered the WHI protocol without cystocele. At some point during the study the following type of POP was diagnosed -
- 1 in 4 Cystocele
- 1 in 6 Rectocele
- 1 in 100 Uterine prolapse

Hendrix SL, Clark A, Nygaard I, et al.
POP in the Women's Health Initiative: gravity and gravidity.
Am J Obstet Gynecol. 2002;186:1160-1166.

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George White (1866-1926)



- On reviewing the failure of anterior repair:

The reason for failure seems to be that the normal support of the bladder has not been sought for and restored, but instead an irrational removal of part of the anterior vaginal wall has been resorted to, which could only result in disappointment and failure.

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What's wrong with anterior vaginal wall support ?

Is the anterior wall -

- Not as well supported by the levators countering the effects of gravity & abdominal pressure as with the posterior wall ?
- Are the attachments to the pelvic sidewall or apex weaker ?
- Is the connective tissue support more elastic or less dense compared to the posterior wall ?
- Is it more susceptible to childbirth injury or weakening with aging or loss of oestrogen ?

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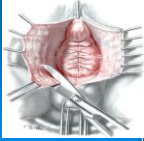
Anterior Compartment

	Follow-up	Failure (variably defined)
Midline fascial plication	1 – 20 yrs	3-58 %
Site-specific fascial repair	6 mths – 2 yrs	10-32 %
Vaginal-paravaginal repair	6 mths – 6 yrs	30-67 %
Abdominal paravaginal repair	6 mths – 6 yrs	20 %
Concomitant sling support	17 mths – 4 yrs	2-57 %

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Surgical Management of Cystocele

- Disappointing results with 'standard' vaginal repair.
- Mesh kits: Commercial success but significant concerns regarding mesh erosion, dyspareunia and other adverse events
- Recurrence rates vary with definition of failure: Weber et al 2001 (56%) & Sand et al 2001(43%)



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So why does POP surgery fail?

Depends on:

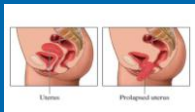
- Type of operation
 - Primary /Secondary
- Other risk factors
 - Surgical skill / volume cases
- Definition failure/follow-up
 - Other outcome parameters
- Follow-up period
- Technique



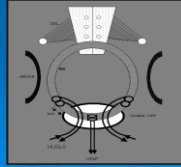
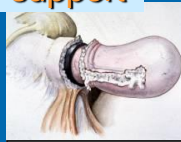
Failure to recognise Apical Descent

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Prevention – Peri-cervical 'cuff' of support



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Classification of procedures for Apical Support at Cystocele Repair

- High Uterosacral Ligament Suspension
- Sacrospinous fixation
- Iliococcygeus Fixation
- Colpocleisis / colopectomy
- Mesh Suspension Kits
- Capio and other fixation devices +/- mesh

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Dr Robert Shull High Uterosacral Ligament Suspension

- Remnants of the US plicated across the midline with 2-4 nonabsorbable sutures.

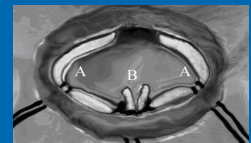
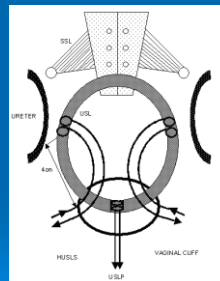


- Delayed absorbable sutures used to suspend anterior & posterior walls with underlying fascia to the plicated US ligaments.



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HUSLS



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Outcome HUSLS

Transvaginal approach to repair of apical and other associated sites of POP with uterosacral ligaments.

Shull et al

DESIGN: (1994-1998) 302 consecutive cases apical + other defects. Transvaginal repair with native tissue. All cases \geq G1 apical POP and other site. 289(96%) \geq 1 F/U. Durability via life table analysis for 5 vaginal sites.

RESULTS: 251(87%) no POP. 38(13%) had \geq G1 apical + one or more sites with at least G1 POP. 14(5%) $>$ G2.

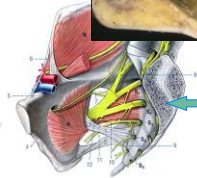
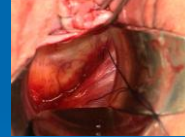
The anterior segment (bladder) was the site with most persistent or recurrent POP. The urethra and cuff most durable repairs.

Morbidity 1% transfusion, 1% ureteral injury, 0.3% postoperative death.

Am J Obstet Gynecol, 183:1365-1373.

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Sacrospinous Ligament Suspension



Sacrospinous ligament

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Sacrospinous and Prespinous Fixation



Nichols 1952

Inmon 1963

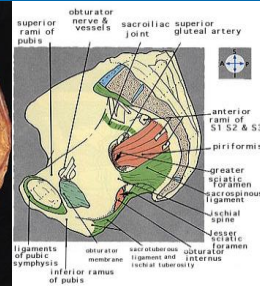
Technique

- SSF - The tip of the ligature carrier penetrates the ligament at a point **2 finger-breadths medial** to the ischial spine. 2 permanent sutures. Unilateral
- PSF – Caudal to spinous process and bilateral insertion



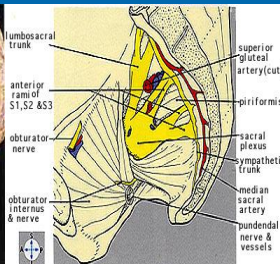
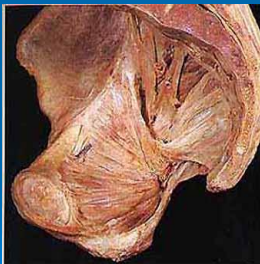
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Sacrospinous Ligament



ICS/UGA Toronto 2010

Sacrospinous Ligament



ICS/UGA Toronto 2010



Sacrospinous Fixation

	YEAR	N	TYPE	NEW CYSTO	NERVE	F/U	MEAN	FAIL	
Lanitzsch	2001	1988-99	200	R UL	8%	7.5%	6-108MTHS	4.8YRS	3%
Cespedes	2000	1996-99	28	BL(ANT)	2/28	?	5-36MTHS	17MTHS	1/28
Meschia	1999	63 T 40 P	R UL				?		6%
Ozcan	1999	1999	54	R UL	3(5.5%)		4-54MTHS	28MTHS	2/54
Shull	1992		81	R UL	13/81	?	2-5YRS		3%

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Ooccygeal Fixation (ICF)

Described by Inmon (1963)

- Easier than Sacrospinous fixation
- Popularised by Shull (1993)
- Usually performed as a bilateral procedure with pre-spinous fixation to iliococcygeus fascia

ICS/IUGA Toronto 2010



Bilateral attachment of vaginal cuff to iliococcygeus fascia: an effective method of cuff suspension.

Shull BL, Capen CV, Riggs MW, Kuehl TJ. AMJOG 1993

- **DESIGN:** 42 suspension of the vaginal cuff via ICF and repair of coexisting pelvic support defects between 1987-1992. The findings at the 6-week postoperative visit and subsequent visits were compared for support of the vaginal cuff and additionally for the urethra, bladder, cul-de-sac, and rectum.
- **RESULTS:** 2 (5%) recurrent cuff prolapse (1 further surgery). The other patient 5 previous repairs was asymptomatic.
- **CONCLUSION:** 95% no persistence or recurrent cuff prolapse 6 weeks -5 years after the procedure

ICS/IUGA Toronto 2010



Comparative Studies

SSF versus Sacrocolpopexy

➤ Benson 1996

48 Bilateral SSF vs 40 Sacrocolpopexy (SCMI)
Failure rates - 29% SSF vs 16% SCMI

Conclusion: Abdominal > Vaginal approach

➤ Drutz 1996

125 SSF vs 80 SCMI

Failure rates - 2.4% vs 1.3%

ICS/IUGA Toronto 2010



Comparative Studies

SSF versus ICF

Maher CF, Murray CJ, Carey MP, Dwyer PL, Ugooni AM

- **METHODS:** 1994-1998, 78 SSF and 50 ICF for symptomatic vault prolapse. A matched case-control study.
- **RESULTS:** 36 matched pairs, study power of 50% to detect a 20% difference in success rates between the two groups.
- **RESULTS:** subjective success ICF 91% VS 94% for SSF (P = .73). Objective success rate 53% VS 67% (P = .36), satisfaction with surgery 78/100 and 91/100 (P = .01) No significant difference was seen in the incidence of postoperative cystoceles or damage to the pudendal neurovascular bundle.
- **CONCLUSION:** SSF AND ICF are equally effective procedures for vaginal vault prolapse and have similar rates of complications.

Obstet Gynecol 2001

ICS/IUGA Toronto 2010



Obliteration of the Vagina

ICS/IUGA Toronto 2010

Colpectomy & Colpocleisis

Obliterative Procedures

- Apposes the anterior & posterior vaginal walls
- Used only as a last resort to cure prolapse
- Leaves a non-functional vagina
- Commonly used in the elderly, medically fragile, no other treatment options except indefinite pessary use.



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Colpectomy & Colpocleisis Obliterative Procedures

- Advantages:
 - Performed quickly
 - Minimal risk of blood loss
 - Performed safely under regional or local anaesthesia
- Disadvantages:
 - Sexual intercourse not possible
 - Subsequent hysterectomy difficult
 - Subsequent risk of de novo incontinence



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Colpectomy & Colpocleisis Obliterative Procedures

- Post-op urinary stress incontinence rate - 30%
 - Fusion of anterior rectal wall to the base of the bladder causing descent & flattening of the bladder neck & proximal urethra
 - Perform simultaneous bladder neck plication or mid-urethral tape is advisable. Pre-op urodynamics ?

		f,up (y)	N	SUI post op
Harmantly et al	2003	3	32	48 %
Fitzgerald et al	2003	30	24	26 %
Am J Obstet Gynecol				
De Lancey	1997	3	33	15 %
Am J Obstet Gynecol				
Deval et al	2005	3	30	16 %
In press				

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Colpectomy & Colpocleisis Obliterative Procedures

Surgical options

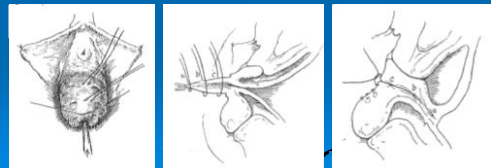


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Colpectomy Obliterative Procedures

Technique:

- Hystererectomised
- Completely excise vaginal mucosa
- Series of purse-string, delayed absorbable sutures are placed, slowly inverting the vaginal muscularis & fascia
- Perineorrhaphy & mid-urethral sling



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Colpectomy Obliterative Procedures

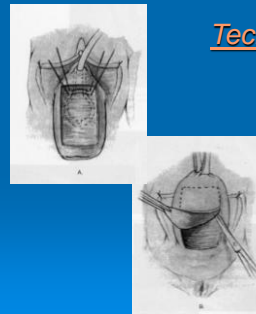


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LeFort's Colpocleisis Obliterative Procedures

Technique:

- Uterus in situ/ D&C
- Catheterise & local anaesthetic block
- Mark out areas to be denuded
 - 2 cm from cervix
 - 5 cm from urethra
- Shave off mucosa to maximise underlying fascia

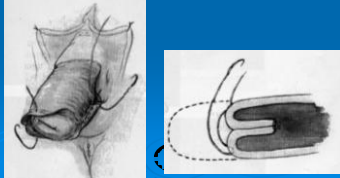


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LeForte's Colpocleisis

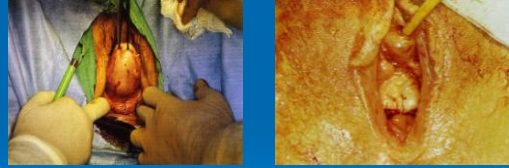
Obliterative Procedures

- Appose anterior & posterior walls, interrupted sutures
- Vagina/uterus pushed inwards
- Close transversely at end
- Bilateral tunnels to allow cervical secretions/blood
- Mid-urethral tape
- Perineorrhaphy



Colpectomy & Colpocleisis

Obliterative Procedures



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Colpectomy & Colpocleisis

Obliterative Procedures

Investigator/s	Patients (n)	Duration of follow-up (mos)	No. cured (%)	Recurrence
Langmade & Oliver 1986	102	12-144	100	0
DeLancey & Morley 1997	33	35	97	1 (vault)

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Mesh Kits Anterior Cystocele and Apical Prolapse



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Minimally Invasive Surgical (MIS)

- Anterior & posterior suspensory & support systems
- Prepackaged devices with introducing trochars and graft
- Different trochars to suit surgeon
- Different grafts available synthetic or biological
- Trochars and grafts can be varied to suit surgeon
- Grafts can be trimmed to suit patient

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Potential advantages Minimally Invasive Surgical (MIS) kits for POP

- Minimise operating and preparation time
- Disposable trochars
- Standardised approach
- Day procedure?
- Easy?
- Cost offset by above advantages?

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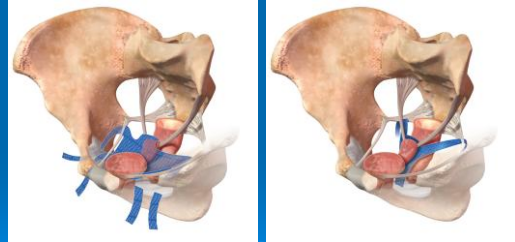
Which Kits are currently available?

- Gynecare – TVM (Total vaginal mesh)
- AMS – Apogee and Perigee
- Boston Scientific – Pinnacle / Uplift
- Bard – Avaulta

And Many Other Kits

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GYNECARE PROLIFT*

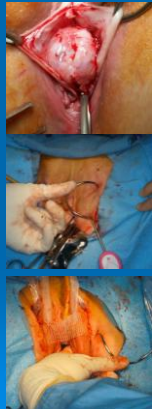


Anterior Mesh

Posterior Mesh

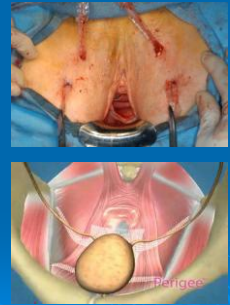
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AMS: Perigee®



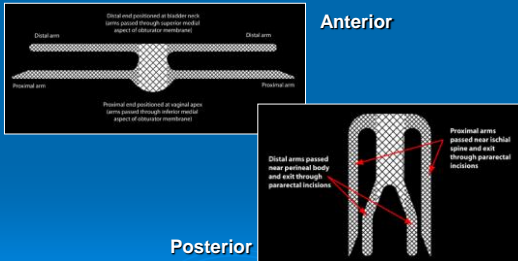
ICS/IUGA Toronto 2010

AMS: Perigee®



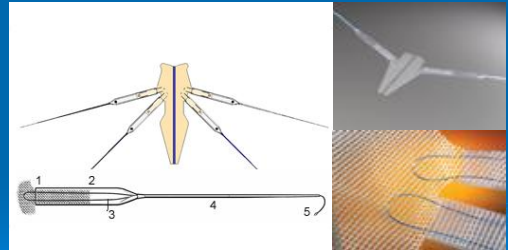
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Avaulta™: BioSynthetic Support System



ICS/IUGA Toronto 2010

Pinnacle



ICS/IUGA Toronto 2010

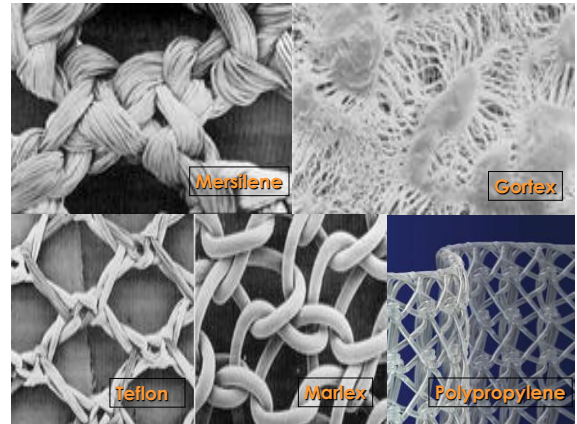
Choosing Your Material

Synthetic Mesh

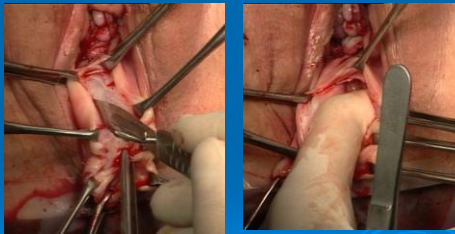
- Permanent "for better or worse"
- Erosion rates 5 - 13%
- Long-term data still lacking
- Key functional outcomes
 - Dyspareunia?
 - Mesh Contraction?
 - Sexual function ?
 - Bladder dysfunction ?
 - Bowel dysfunction ?



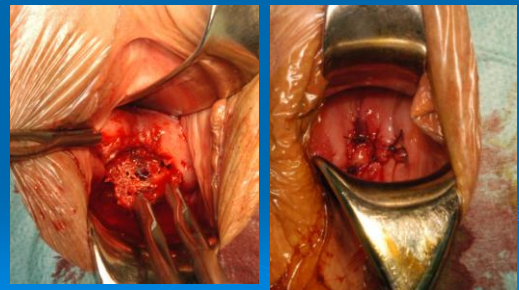
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Surgical Intervention



ICS/IUGA Toronto 2010



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Biological grafts & Cystocele Repair

Advantages

- Avoid erosion
- Minimise wound healing issues.
- Improved sexual function.

Disadvantages

- Cost
- Anchoring technique
- Longevity of graft
- Host versus Graft interaction
- Outcome data



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Evidence?



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Efficacy of MIS POP techniques ?

Clear definitions of outcome

- POP in corrected compartment < grade 1
- No POP symptoms
- No new POP in another compartment
- No coital dysfunction
- No new bowel or bladder incontinence
- No new voiding or defecatory dysfunction

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TVM:Prolift

Author	N	Follow up	Success	Erosion	Other
Fatton	110	3 mths	95%	5%	1 intraop bladder injury
Cosson	90	12 mths	82%	10%	
Murphy	89	5 mths	94%	0	2 bladder perforations 1 vesicovaginal fistula
Hinoull	29	6 mths	97%	7%	1 bladder perforation
Perschler	50	3 mths		12%	1 bladder perforation 2 blood transfusions 2 re-operation 2ary to haematoma

ICS/IUGA Toronto 2010

Perigee

Author	Year	n	Follow up	Success	Erosion	Other
Moore RD	IUGA 2006	42	12 mths	93%	7%	3 SUI 1 OAB
Dietz HP	IUGA 2006	48	11 mths	92%	10%	
Martinez Paya MJ	ESGE 2005	36	?	?	0	Apogee & Perigee
Golze	ICS 2005	63	6-8 wks	?	4.7%	2 haematoma 2 de novo enterocele

ICS/IUGA Toronto 2010

Follow-up after polypropylene mesh repair of anterior and posterior compartments for recurrent POP.

Garuder-Burmeister A et al

AIM: Analysis POP outcome at 1 year with Apogee (posterior) or Perigee (anterior) mesh repair kits. 120 recurrent cystocele and/or rectocele or combined vault POP. After 1 year (+/-31 days) POP-Q assessment, TVL, evaluation vaginal mucosa (mesh erosion).

RESULTS: 112(93%) ≤ G1, 8 (7%) G2. Erosions more common (p = 0.042) with Perigee.

CONCLUSION: Apogee/ Perigee excellent short-term results at 1 year

IUJ 2007

ICS/IUGA Toronto 2010

Avaulta (Bard)

- Technique – no fascial plication, graft inserted, no skin excision, continuous vicryl suture closure
- Concomitant – SSF, VH or Mid-urethral tape as required
- Follow-up – 6 weeks, 6 mths & 1 year
- Success defined as IPOP stage 0-1, improved QoL PFDI, PIIQ, MHU, absence of dyspareunia

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De Tayrac et al IUJ 2006

Avaulta (Bard)

Complications –

De Tayrac et al IUJ 2006

- 4.2 % intra-op – 3 bladder, 1 rectal perforation
- 2 postop haematoma – 1 partial excision mesh
- 9(6.3%) erosion by 3 months
- Dyspareunia – 14.5% (10/69) not 12.8%(10/78)

Success – (mean F/U:13 mths (R10-19)

- 92.3% anatomical cure (Stage 0-1)
- Recurrent cystocele 6.8% vs rectocele 2.6%
- PFDI & PIIQ significant improvement (p<0.0001)

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Anatomic outcomes of vaginal mesh (Prolift) compared with uterosacral ligament suspension & abdominal sacrocolpopexy for POP: a Fellows' Pelvic Research Network study.

Sanses TV, Shahryarinejad A, Molden S.

AIMS: Compare apical outcomes after Prolift (VMP) vs uterosacral ligament suspension (USLS) and sacrocolpopexy (ASC).

DESIGN: Multi-center retrospective chart review compare apical success (stage 0 or 1 based on point C or D of POP-Q) 3-6 months after POP repair at 10 US centers (2004-2007).

RESULTS: For VMP (206), USLS(231), ASC(305) there was no difference in apical success - VMP (98.8%),USLS (99.1%) or ASC (99.3%). Mean elevation of the apex was lower after VMP (-6.9 cm) USLS (-8.05 cm) and ASC (-8.5 cm) (both P < .001)

CONCLUSION: Patients VMP, USLS and ASC have same anatomic POP-Q success despite lower vaginal apex 3-6 month after surgery.

ICS/IUGA Toronto 2010

AMJOG 2009

Efficacy and safety of using mesh or grafts in surgery for anterior and/or posterior vaginal wall prolapse: systematic review and meta-analysis. Jha J, Ghazwan C, Mowall G, Mackinnon G, Bain C, Fraser C, Barr J. Health Services Research Unit, University of Aberdeen

OBJECTIVES: To systematically review the efficacy and safety of mesh/graft for anterior or posterior vaginal wall prolapse surgery.

SELECTION CRITERIA: Randomised controlled trials (RCTs), nonrandomised comparative studies, registries, case series involving at least 50 women, and RCTs published as conference abstracts from 2005 onwards.

ANALYSIS: 3 groups: anterior, posterior, anterior +/- posterior repair (not reported separately).

RESULTS: 49 studies (N=466) mesh/graft POP repair. Median follow up 13 months (R 1-31) For Anterior repair, short-term evidence that mesh/graft (any type) significantly reduced objective prolapse recurrence rates compared with no mesh/graft (relative risk 0.48, 95% CI 0.32-0.72).

GRAFTS PROLAPSE RECURRENCE	EROSION RATE
Non-absorbable synthetic (8.8%, 48/548)	Non-absorbable (10.2%, 88/866)
Absorbable synthetic (23.1%, 63/273)	Absorbable synthetic (0.7%, 1/147)
Biological graft (17.9%, 186/1041)	Biological graft (6.0%, 35/581)

CONCLUSIONS: Evidence for most outcomes was too sparse to provide meaningful conclusions.

Rigorous long-term RCTs are required to determine the comparative efficacy of using mesh/graft.

ICS/IUGA Toronto 2010

BJOG 2008



Capio technique



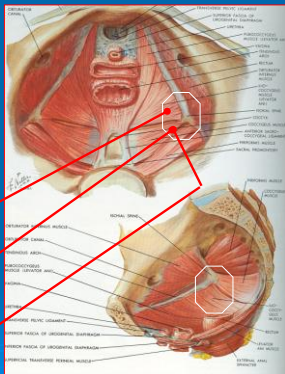
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- Cut suture in 2 to get 2 throws
- Remember needle tip

Toronto 2010

Apical Suspension: Comparing Devices



Posterior IVS Apogee

Prolift

Capio

ICS/IUGA Toronto 2010

Capio Fixation: Advantages Over Trocar Perforation with MIS prolapse kits

- **Improved Safety**
 - 100% Retroperitoneal
 - "Trocar-Free"
 - No Perforation of Gluteal, Obturator, Levators
 - Low Risk Rectal Perforation
- **Higher Suspension**
 - "Gold Standard" Sacrospinous
- **More Anatomically Correct**
 - No Stray Mesh Arms
 - Cheaper !!



ICS/IUGA Toronto 2010

"Arcus to Arcus" Graft

Level I Support Restored

Central Defect Covered

Fascial Reconstruction Repairing Enterocele

Paravaginal Defect Repair

Suture Placement: "6-Point Suspension"

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Which Operation ?

ICS/IUGA Toronto 2010

Choosing Type of Cystocele Repair +/- Apical Support Procedure

- Previous Surgery
- Type Cystocele – Clinical Evaluation
- Bladder Dysfunction – Urodynamics
- Levator, Fascial Defects, Type of Cystocele
- Likelihood of connective tissue deficiencies
- Effects of genetics, childbirth, aging and oestrogen deficiency on the pelvic floor and anterior compartment support

ICS/IUGA Toronto 2010

Cystocele: Midline Defect

- Damage to pubocervical fascia
- Fascia stretches and weakens
- Bladder sinks into the middle of the upper vaginal wall

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Cystocele: Lateral Defect

- Detachment of fascia from arcus tendineus
- Fascia tears away from their attachments to the sidewalls of the pelvis

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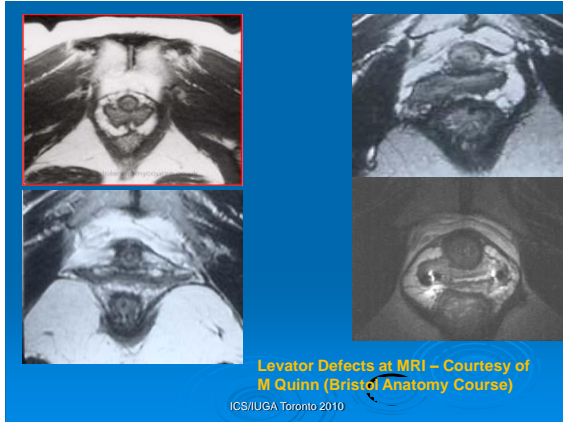

Clinical Presentation

Figures – From Dee Fenner et al

A transverse defect with loss of the anterior fornix.

A cephalad defect - loss apical attachment at ischial spines.

ICS/IUGA Toronto 2010


Residency Training

Should SSF for POP be part of a residency program procedure?
 Penalver M, Mekki Y, Lafferty H, Escobar M, Angiolli R.


OBJECTIVE: Safety and effectiveness of SSF as part of POP management in a residency program.
DESIGN: Review of patients undergoing SSF between 1990-1995.
RESULTS: 160 underwent R SSF, AVR and PVR.
 Complications - 13 (8.1%), urinary infection 16 (10%), blood loss requiring transfusion 7 (4.3%), sciatic neuralgia 2 (1.2%), and rectovaginal fistula 2 (1.2%). Mean follow-up 40 months (R18-78). Success gauged by recurrence. 94% no vaginal vault prolapse and 85% no recurrence of any pelvic support defect. 11/24 recurrence cases underwent surgery
CONCLUSION: R SSF should be an essential component in the training of gynecologic residents.

AMJOG 1998

ICSI/IUGA Toronto 2010



Conclusions



Successful Surgical repair of Cystocele

- Evaluation of the type of anterior wall defect and directed repair technique
- Recognition and Correction of Apical Descent
- Re-inforcement or replacement of native support tissues with a graft ?
- Synthetic versus biologic graft factors ?
- Stem cells ?
- Effect of neurological & mechanical Levator injury
- Role of concomitant Pelvic Floor Rehabilitation

ICSI/IUGA Toronto 2010



Workshop 16

Vaginal surgery: is apical support always necessary at the time of anterior repair

Vaginal surgery with mesh: is apical support always necessary at the time of anterior repair

Brigitte Fatton, MD
University Hospital of Clermont-Ferrand
FRANCE



Epidemiological considerations

Epidemiology of Surgically Managed Pelvic Organ Prolapse and Urinary Incontinence

AMBRE L. OLSEN, MD, VIRGINIA J. SMITH, MD, JOHN O. BERGSTROM, MD, JOYCE C. COLLING, RN, PhD, AND AMANDA L. CLARK, MD

1997



Table 6. Anatomic Site of Prolapse and Incontinence Procedures

Anterior compartment only	154 (40.1%)
Posterior compartment only	28 (7.3%)
Apex only	22 (5.7%)
Anterior and posterior compartments	60 (15.6%)
Anterior compartment and apex	33 (8.6%)
Posterior compartment and apex	18 (4.7%)
All compartments	69 (18.0%)

N = 384.

Data are presented as n (%).

Retrospective cohort study

Anatomical considerations

- The apex is often involved in high grade cystoceles
 - in those patients it is essential to surgically address the involvement of the middle compartment appropriately



American Journal of Obstetrics and Gynecology (2006) 194, 1038-43



The relationship between anterior and apical compartment support

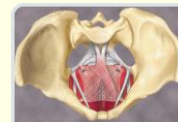
Aimee Summers, BSE,* Lisa A. Winkel,* Hero K. Hussain, MD,* John G. L. DeLancey, MD**

2006



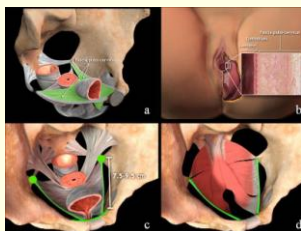
**Technical considerations
Ant mesh kits**

- 2 types of Anterior Mesh kits
 - those designed for the combined repair of anterior and middle compartments (Level II and I)
 - ✓ Ant Pinnacle
 - ✓ Ant Elevate



Ant Mesh kits

- those designed to provide anterior repair only (Level II)
 - ✓ Ant Prolift
 - ✓ Perigee
 - ✓ Avaulta



Level II repair (the hammock theory)
Not designed to restore apical support

The total (not the anterior) vaginal mesh concept should be considered when apical vaginal support is the issue

2009



Piet Hinou, MD
Ethicon, Women's Health and Urology
Issy-les-Moulineaux, France
Phinou@its.njn.com

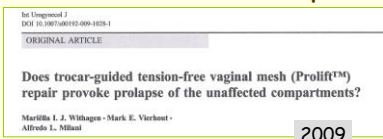
Bernard Jacquelin, MD, PhD
Department of Obstetrics and Gynaecology
Hôtel-Dieu, University Hospital
Clermont Ferrand, France
bjacquelin@chu-clermontferrand.fr

REFERENCES

1. Larson KA, Hsu Y, DeLancey JO. The relationship between superior attachment points for anterior wall mesh operations and the upper vagina using a 3-dimensional magnetic resonance model in women with normal support. Am J Obstet Gynecol 2009;200:554.e1-6.

APRIL 2010 American Journal of Obstetrics & Gynecology e9

Risk of de novo prolapse of the unaffected compartments



2 clinical scenarios

- Deterioration (neglected prolapse) or
- De novo prolapse (non affected compartment)
 - rigorous preoperative physical examination ++

Table 2 POP stage at baseline and at 12 months

Compartment	Stage	Anterior prolift 35 patients		Success	
		Baseline (n=35)	Follow-up (n=35)		
Anterior	0	0	26 (74%)	89% (78-99) ^a	
	I	0	5 (14%)		
	II	10 (29%)	4 (11%)		Ant Recurrence 11%
	III	25 (71%)	0		
	IV	0	0		
Apical	0	10 (28%)	26 (75%)	86% (74-98) ^a	
	I	22 (63%)	4 (11%)		
	II	2 (6%)	4 (11%)		De novo apical prolapse 5.7%
	III	1 (3%)	1 (3%)		
	IV	0	0		
Posterior	0	12 (34%)	9 (26%)	54% (37-71) ^a	
	I	14 (40%)	10 (28%)		
	II	9 (26%) ^{b5}	15 (43%) ^{d2}		De novo post prolapse: 20%
	III	0	1 (3%) ^{d1}		
	IV	0	0		

Concomitant non mesh surgery: 2 SSF, 7 post colporrhaphy

Patients with untreated compartment

Table 3 Effect on non-treated compartment at 12 months

	Anterior Prolift™ (n=26)	
Ba improvement		
Ba equal		
Ba deterioration		
De novo stage ≥II anterior compartment		
C improvement	18 (69%)	
C equal	3 (12%)	
C deterioration	5 (19%)	
De novo stage ≥II apical compartment	3 (12%)	12%
Bp improvement	3 (12%)	
Bp equal	7 (27%)	
Bp deterioration	16 (62%)	
De novo stage ≥II posterior compartment	12 (46%)	46%
De novo stage ≥II non-mesh compartment	12 (46%) [*]	

SGS PAPERS

www.AJOG.org

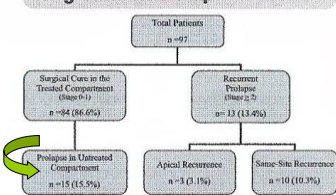
One-year anatomic and quality-of-life outcomes after the Prolift procedure for treatment of posthysterectomy prolapse

Heather M. van Raalte, MD, Vincent R. Lacombe, MD, MBA, Stephanie M. Molden, MD, Robin Hoff, RN, Miles Murphy, MD, MSPH

2008

- Retrospective chart review
- 151 patients
 - 97 (64.2%) presented for 1-year or greater follow-up
- Prolift procedures:
 - 46 anterior
 - 28 posterior
 - 23 total (A+P)

FIGURE
Surgical outcomes at 1-year or greater follow-up



van Raalte. One-year anatomic and QOL outcomes after the Prolift procedure. Am J Obstet Gynecol 2008.

Prolapse of the untreated compartment: 15.5%

- Of the 86 patients initially presenting with apical prolapse, only 3 (3.5%) experienced recurrence
- In addition 15 patients (15.5%) had stage 2 or greater prolapse occurring in the untreated vaginal compartment

Our experience

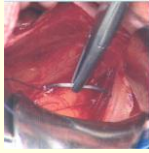


- Transvaginal mesh repair with Prolift procedure
 - 125 patients between March 2005 and August 2006
 - ✓ Ant and post mesh repair: 64 (51,2%)
 - ✓ anterior mesh repair only: 41 (32,8%)
 - ✓ posterior mesh repair only: 20 (16%)
 - minimal 1 year follow-up

Our experience

- Among the 41 patients with anterior mesh repair only, concurrent procedures were
 - vaginal sacrospinous fixation (Richter): 3 patients (7,3%)
 - sacrospinous hysteropexy Richardson): 10 patients (24,3%)

68.3% of patients without concurrent apical repair



Our experience

• Anatomical results (1y fu)

- 4 failures (9,7%)
 - ✓ 2 among patients with concomitant apical repair (2/13 = 15,3%)
 - 1 cystocele
 - 1 apical recurrence: **failure after SSF**
 - ✓ 2 in patients without apical support (2/28 = 7,1%)
 - 1 apical prolapse: **de novo apical prolapse**
 - 1 rectocele

Global rate of apical prolapse after Ant Prolift: 2/41: 4.9%

De novo apical prolapse: 3.6%

A good screening of patients is necessary: in women with an isolated problem with anterior compartment support, cystocele repair alone leads to good results in case of well supported apical segment

Vaginal surgery with mesh: is apical support always necessary at the time of anterior repair ?

NO !

But carefully evaluate the need for reattaching the apex at the time of surgery for cystocele

If concurrent apical repair is needed, discuss

- Traditional surgery: SSF, USLS
- Or mesh repair



Anterior Sacrospinous and Anterior Mesh: The Combined Approach

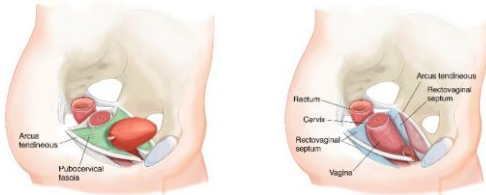
Dr. Roger Goldberg, MD, MPH

Clinical Assistant Professor of Obstetrics & Gynecology
University of Chicago Pritzker School of Medicine
Director of Urogynecology Research,
Northshore University HealthSystem

Goals

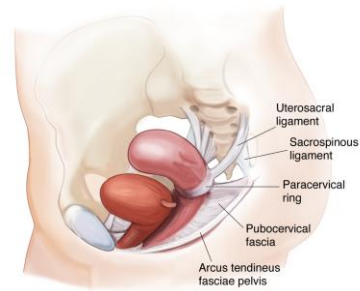
- Discuss the “apical component” of cystoceles
 - Key Challenge in Pelvic Reconstruction
- Improving the Vaginal Approach
 - Mesh Usage – our philosophy
 - Focus on both efficacy and safety
- University of Chicago “Minimal Mesh” Approach
 - Technique steps
 - Successes to Date

Anterior & Apical Compartments: Connective Tissue Planes

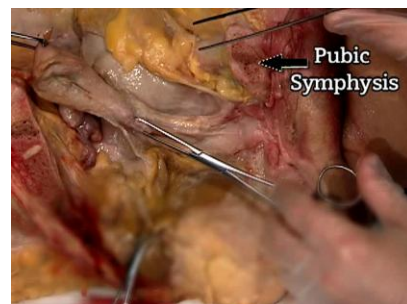
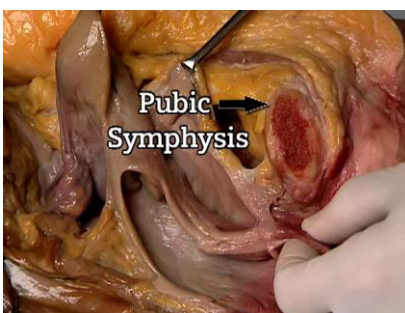


- “Envelope” of Anterior & Posterior Fascia – Fused at the Apex
- Key Component of Normal Female Pelvic Anatomy
- **Surgical Goal:** Suspend Apex to Level I & Reinforce Fascial Attachments

Pelvic Floor Anatomy







Pelvic Floor Anatomy



Apical Repairs

- >170,000 seek treatment for Apical defects in US each year¹
- Yet, current repair options remain challenging
- Intimidating task for many GYN surgeons

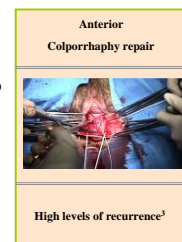
Standard vaginal repair	Vaginal kit repair	Abdominal repair	Laparoscopic repair
			
Invasiveness, variable results	Poor apical support & trocar risks	Invasive procedure	High degree of skill required ²

¹ Ostrowski, Laparoscopic colposuspension for total vaginal prolapse. In Journal of Gynecology and Obstetrics, (1996) 55, 2, pp 147-52
² Weber AM et al. Anterior Colporrhaphy: a randomized trial of three surgical techniques. Am J Obstet Gynecol. 2001;185(6):1299-304
³ Jelovsek, et al. Anatomic relationships of Intrafasciococcygeal Sacrospy (Posterior Intravaginal Slingplasty) trocar insertion, Obstetrics & Gynecology (2005) 103, 2099-104.

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Cystocele Repairs: Why Such a Challenge?

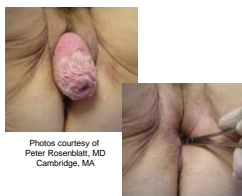
- Anterior Colporrhaphy:
objective recurrence in 25-52%
of women within 5 years¹



¹ Anterior colporrhaphy: a randomized trial of three surgical techniques. Weber AM, et al. Am J Obstet Gynecol. 2001;185(6):1299-304

Cystocele Repairs: The “Apical Component”

- Simulated restoration of apical support corrects 55% of cystoceles and 30% of rectoceles, demonstrating **traction bulges more common than anticipated.**¹
- Achieving “gold standard” **suspension at vaginal apex** results in superior overall outcome for most repairs.¹
- **Addressing the apex** quickly, effectively and safely represents a key hurdle for many GYN surgeons.



¹ Lowder et al. The Role of Apical Vaginal Support in the Appearance of Anterior and Posterior Vaginal Prolapse. Obstetrics & Gynecology 2006; 111 (1): 152-7

Anterior & Apical Defects Routinely Coexist

- Relationship between anterior & apical supports
 - DeLancey, et al. Am J Obstet Gynecol 2006;194:1438-43
 - Anterior/Apical compartments strongly correlated (r^2 0.53, $p < .0001$)
 - **Loss of apical support critical to development of anterior bulge**
- Advanced anterior & apical defects: strongly correlated
 - Rooney, et al. Am J Obstet Gynecol 2006;195:1837-40.
 - Anterior vaginal wall defects that are surgically repaired usually require a concomitant repair of the apex.

Adding Mesh to the Apical Repair?

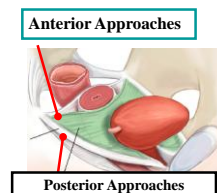


- Mesh usage may provide better long term support¹
 - Hiltunen: 37 of 97 women (38.5%) in no-mesh group versus 7 of 104 women (6.7%) in mesh group had recurrence of anterior prolapse ($p < .001$) at 12 months¹
- However ...
- Surgical technique may affect the rate of mesh erosions²
- Lack of apical mesh fixation may result in clinical failure of the repair.

¹ Hiltunen, et al. Low-Weight Polypropylene mesh for Anterior Vaginal Wall Prolapse. Obstet Gynecol 2007; 110: 455-62
² Collinet et al. Transvaginal mesh technique for pelvic organ prolapse repair: Mesh exposure management and risk factors. Int Urogynecol Journal (2006) 17: 314-20.

Anterior Sacrospinous Vault Suspension

- Retrospective study results:
 - **Longer vaginal length** than posterior sacrospinous suspension¹
 - **Recurrent** anterior vaginal relaxation is **less likely**¹
 - Provides **anatomically correct** outcomes¹



¹ Goldberg, et al. Anterior or Posterior Sacrospinous Vaginal Vault Suspension: Long-Term Anatomic and Functional Evaluation. Obstet Gynecol 2001; 92:199-204

Anterior Sacrospinous Fixation

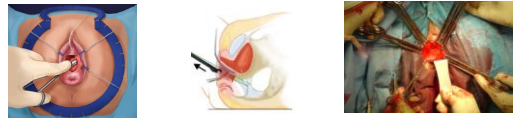
- “Anterior or Posterior Sacrospinous Suspension: Long-Term Anatomic and Functional Evaluation”
 - *Goldberg et al, Obstet Gynecol 2001;92:199-204*
 - 168 consecutive sacrospinous suspensions
 - 92 posterior, 76 anterior
 - Total vaginal length and apical suspension slightly greater after the anterior suspension
 - Recurrent anterior compartment prolapse less likely



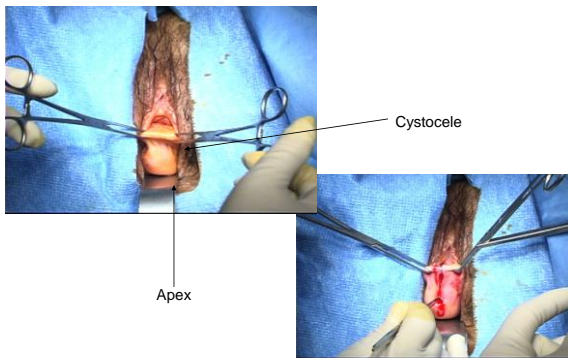
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Anterior Sacrospinous Fixation

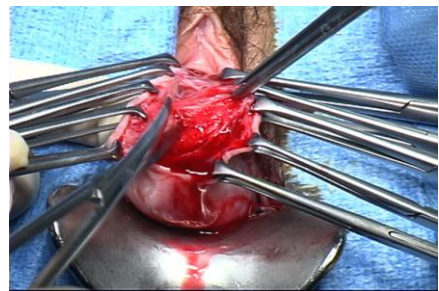
- Evolution to Bilateral “Palpation Only” Technique
 - *Eliminates vaginal narrowing or deviation*
- Synergy with Anterior Graft & Mesh Augmentation
- Excellent Apical & Anterior Results
 - *Botros, et al; Gamble, et al*



Suture-Based Repair: Anterior Dissection



Dissection to Pubic Rami

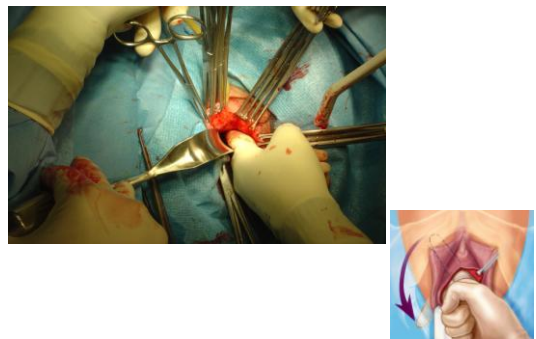


Blunt Dissection Beyond Pubic Rami

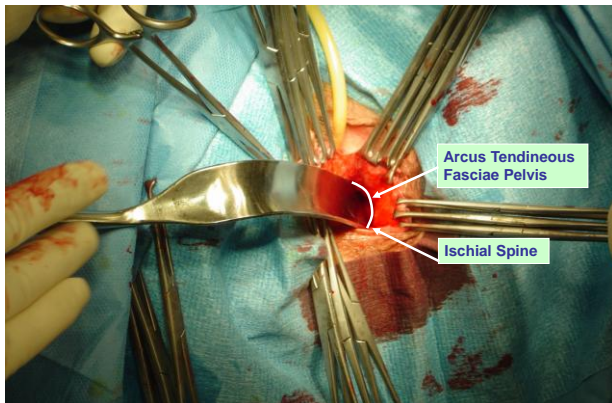


- Gentle “Sweep” Along Obturator Muscle
 - *Pubic Tubercle to Ischial Spine*
 - *“Clean” Plane Against Obturator / Arcus*
 - *No Sharp Perforation Needed*

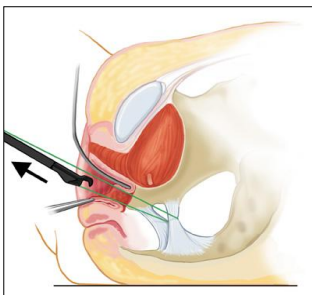
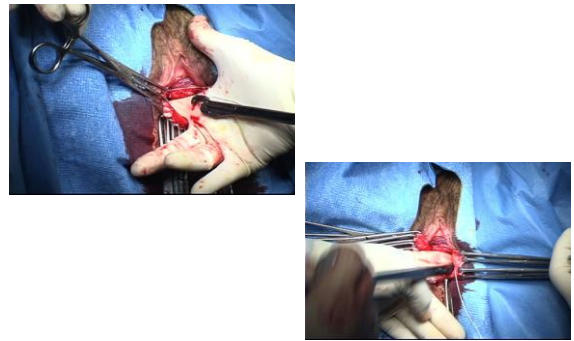
Palpating Anchoring Sites



Suture Based: Exposure of Arcus



Placement of Sutures

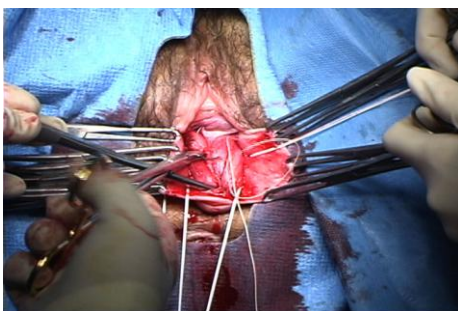


Avoiding Injury

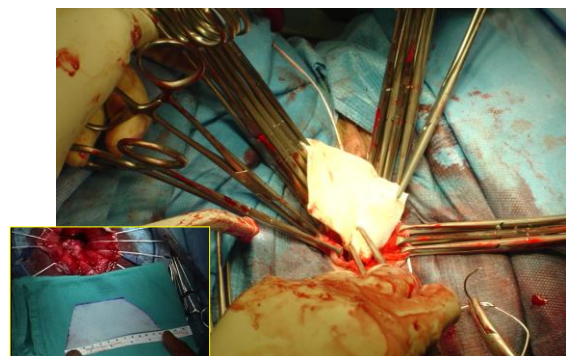
- Avoid aggressive denuding of SSL
- 0.5–1.5 cm medial to spine
 - Pudendal NV bundle: 0.9–1.3cm
 - Inferior Gluteal Artery
- Use superficial portion
 - Suture *into*, *not over* the ligament



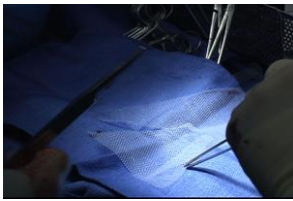
Colporrhaphy (Optional)



Preparing Biograft



Preparing Prolene Mesh

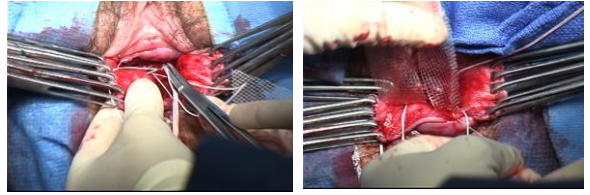


"Trapezoid" for Anterior Compartment



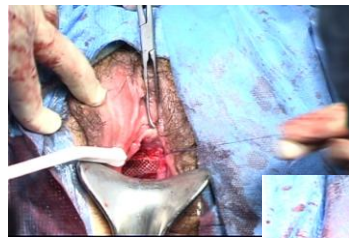
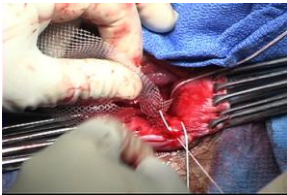
Sutures Passed Through Mesh Pores

Suspending the Apex

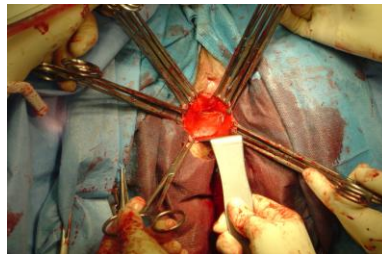


*Achieves Bilateral
Sacrospinous Vault Suspension*

Tying the Sutures



Vaginal Closure

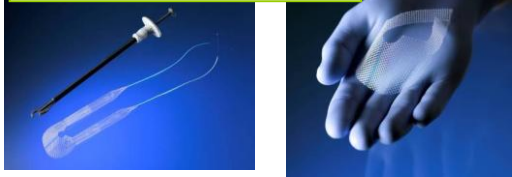


"4 in 1" Repair

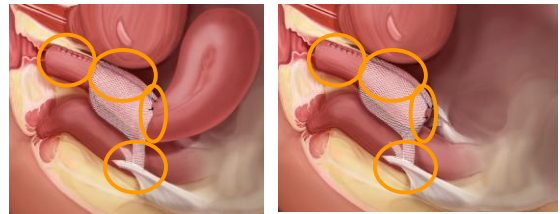
- Bilateral Vault Suspension
- Central Repair
- Paravaginal Defect Repair
- Enterocele Repair

Mesh-Arm Based Repair

- Address Apical Prolapse
- Address Cystocele
- Mesh Only Where it's Needed
- Anterior Sacrospinous Approach
- Completely Intravaginal & "Trocar Free"



Two Clinical Scenarios



Uterus present

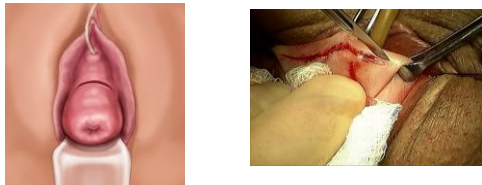
Uterus previously removed

- | | |
|---------------------------------|------------------------------|
| ✓ Apical (Level I) coverage | ✓ Reduced mesh implant |
| ✓ Cystocele (Level II) coverage | ✓ Intra-Vaginal Anterior SSL |

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Device Technique Steps

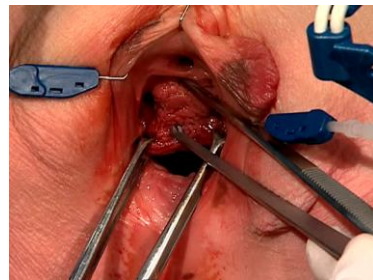
Crescent Incision



A retrospective study demonstrated that reducing the number and extent of vaginal incisions may reduce the risk of mesh exposure.¹

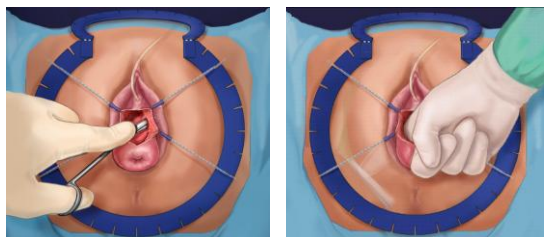
1. Collinet et al. Transvaginal mesh technique for pelvic organ prolapse repair: Mesh exposure management and risk factors. Int Urogynecol Journal (2006) 17: 315-20.

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Device Technique Steps

Dissection



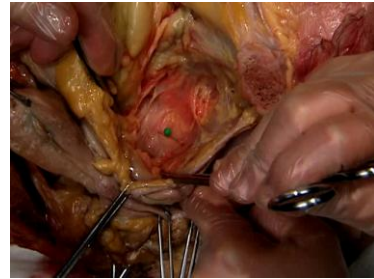
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Device Technique Steps

Leg Placement into SSL

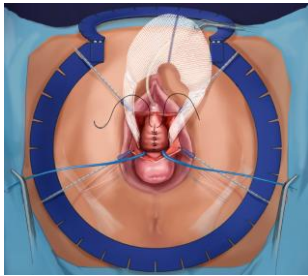


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Device Technique Steps

Anterior Plication

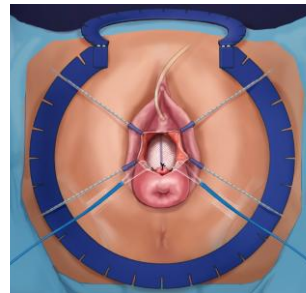


- Reduces surface area of anterior compartment
- Promotes “mesh only where its needed” strategy by **shrinking the mesh coverage zone**

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Device Technique Steps

Attach to Apex with Tacking Sutures



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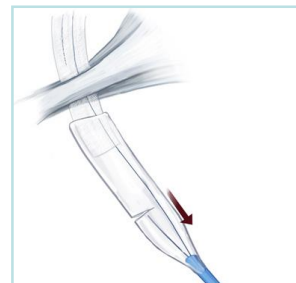
Device Technique Steps

Activating Legs



Device Technique Steps

Sleeve Removal



Device Technique Steps

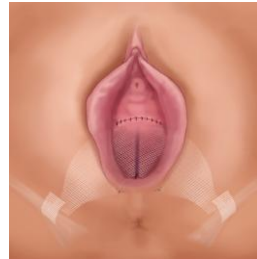
Final Mesh Adjustments



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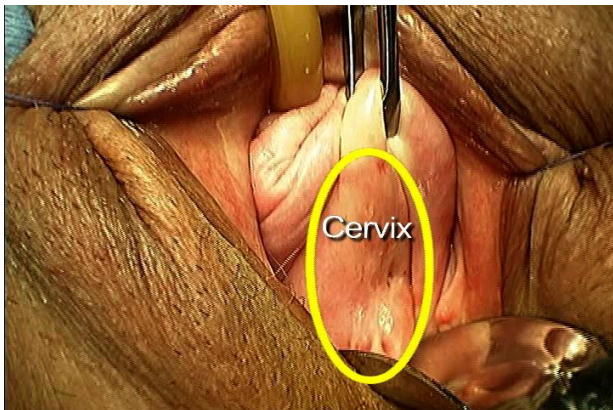
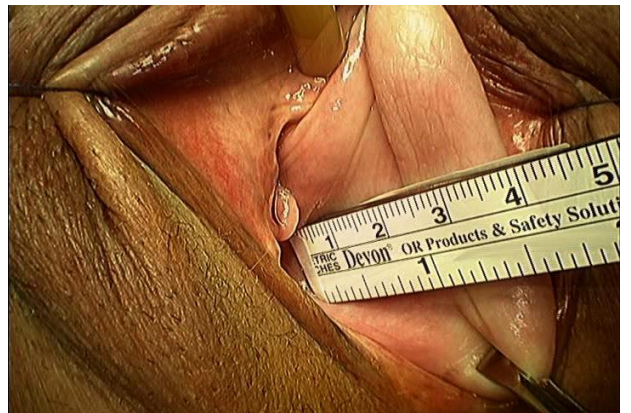
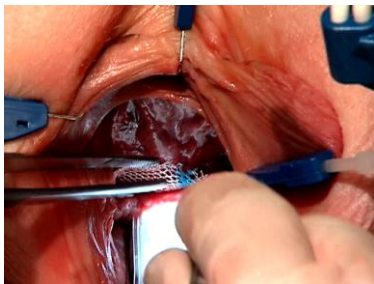
Device Technique Steps

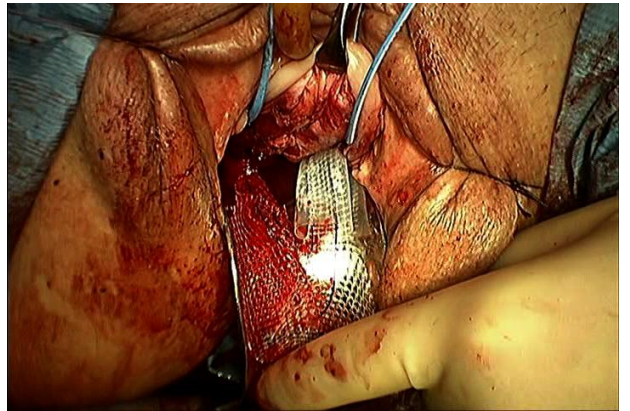
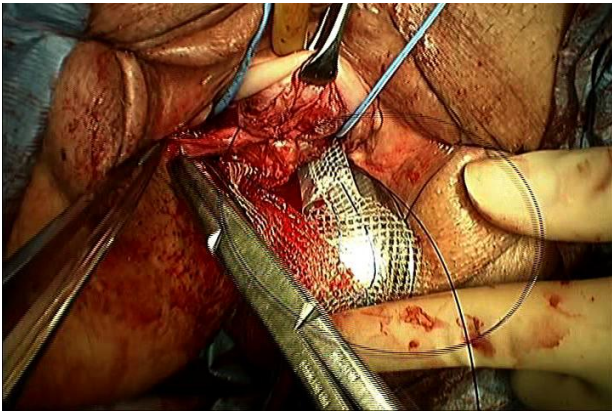
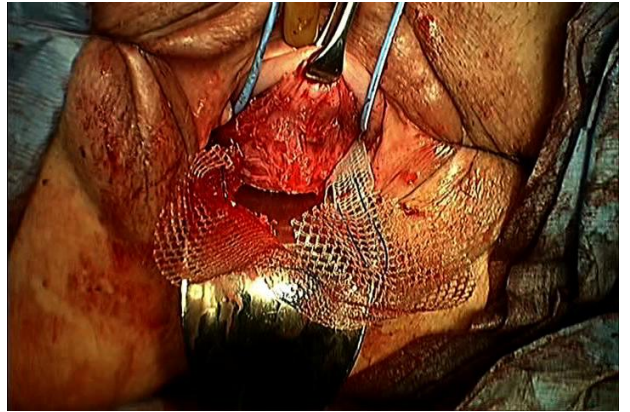
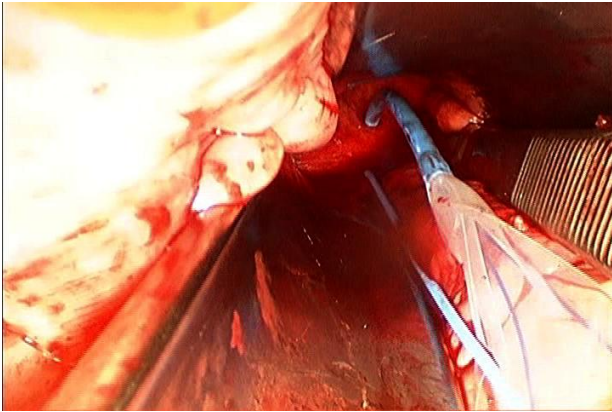
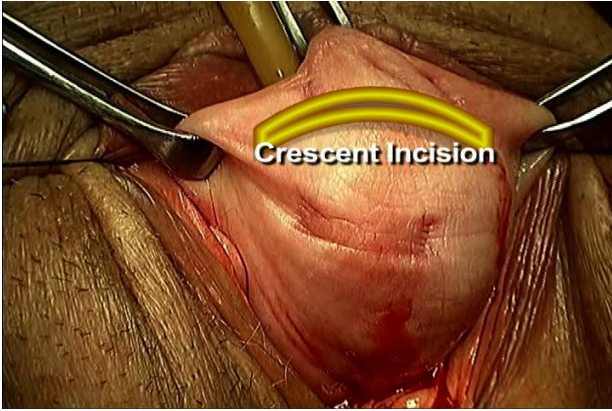
Final Placement

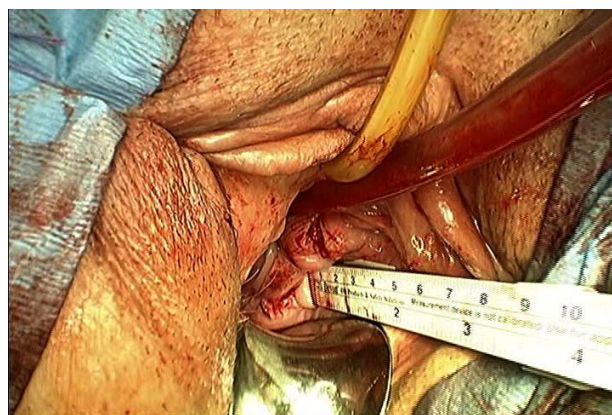
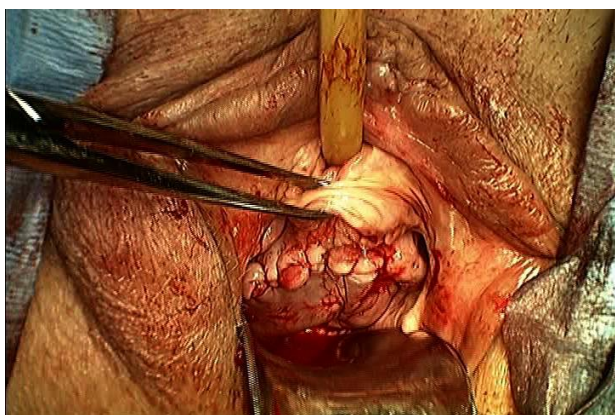
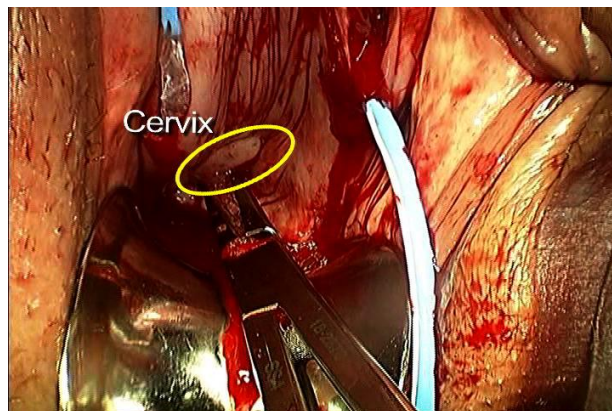
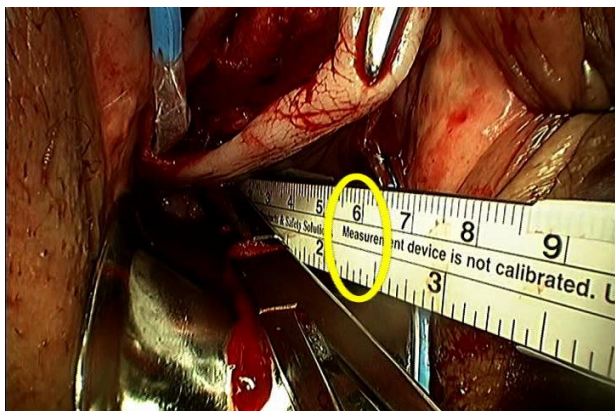


Horizontal incision

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Evolution of Data

Biograft-Augmented Sacrospinous Hysteropexy

- Presented SGS 2009
- Anterior approach to SSL, plus arcus fixation points
- 33 consecutive subjects w/ complete 1 year follow up
 - Mean follow up 17 months (minimum 12)
- Anterior outcomes significantly improved vs. hysterectomy
 - Aa -2.55 vs. -1.75 ($p < 0.004$)
 - Ba -2.5 vs. -1.75 ($p < 0.008$)
 - TVL 9.52 vs. 8.13 ($p < 0.002$)
- Recurrent cystocele after 1 year: 10% vs 29% ($p = 0.08$)
- No erosions
- Technical challenges of graft sizing and tensioning

Evolution of Data

Mesh Augmented Sacrospinous Repair

- Gamble, et al
- 39 consecutive subjects, ≥ 2 anterior-apical prolapse
- "Minimal mesh" repair, preceded development of Uphold
 - Suture based
 - Vertical / T-shaped incisions
- At 1 year:

– Recurrent Cystocele	4.2%
– Recurrent Apical Prolapse:	2.6%
– PFDI	25.9 vs. 77.1 ($p = 0.04$)
– PISQ	27.9 vs. 29.1 ($p = 0.73$)
– Dyspareunia:	21% vs. 22% ($p = 0.71$)
– Mesh Exposure	12.8%

Mesh Arm (Uphold) Technique: Current Data

- **University of Chicago, IL & NorthShore Hospital, NY:**
 - 141 subjects, follow-up 3–18 mos
 - Entire early experience including “learning curve”
 - 94 with uterus intact, 32 vault suspension, 15 with hysterectomy
 - Standardized exam & QOL assessment
- **Summary of significant POPQ differences (pre / post):**
 - Aa -3.06, Ba -3.91, Bp -2.23, C -5.38
 - TVL was unchanged at -0.33 (p=0.36)
- **Mesh Exposure**
 - 2.6% horizontal incision both centers, 1.1% at Site 1
 - 4.26% vertical incision both centers

Uphold: Outcomes First 141 Subjects

- Overall success:
 - 8 (6.1%) had C \geq -1 postop, 5 (3.8%) had C \geq 0
 - 8 (6.1%) had Aa or Ba \geq -1, and 1 (0.8%) had Aa or Ba \geq 0.
- Rates of anterior success (Aa and Ba \leq -1) from 90-95%

Outcomes First 141 Subjects

- **Uterus in Situ:**
 - 4 (4%) had C \geq -1, 2 (2%) had C \geq 0
 - 5 (5%) had Aa or Ba \geq -1 and 0 (0%) Aa or Ba \geq 0.
- **Post Hysterectomy:**
 - 4 (12.5%) had C \geq -1, 3 (9.4%) had C \geq 0
 - 3 (9.4%) had Aa or Ba \geq -1, and 1 (3.1%) Aa or Ba \geq 0.
- **With Vag Hyst:**
 - 2 (13.3%) C \geq -1 and 2 (13.3%) had C \geq 0
 - 1 (1.7%) Aa or Ba \geq -1, and 1 (1.7%) Aa or Ba \geq 0

Experiences to Date *Uphold™ System*

	<u>Postop</u>	<u>Preop</u>
• Mean Aa:	0	-2.89
• Mean Ap:	0	-2.7
• TVL :	9.2	9.4
• Mean C:	-2.1	-7.9
• Maximum preoperative C point:	8.0	
• Dyspareunia reported by 3 patients:		
– 2 from posterior (rectocele) repair		
• PISQ and PFDI being completed at 12 months		

Anterior Sacrospinous with Mesh: Bottom Line

- Current repair showing great promise
 - “Minimal Mesh” approach
 - 75% less foreign body implant
 - 1.1-2.5% exposure rate with horizontal technique
 - Now a streamlined surgical technique
 - Mesh-arm technology
 - No trocars
- Excellent anterior and apical results
- Highly effective for uterine preservation
 - 80% fewer hysterectomies at our center