

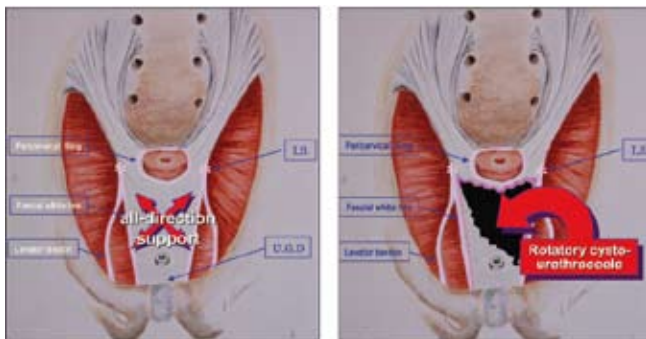
# "A Retrospective Analysis of Vaginal Paravaginal Repair with SurgiSIS® for Severe Cysto-urethrocele"

Richard Reid, Sydney, Australia.  
Email: richard\_reid@dbgyn.com

## BACKGROUND

The bladder is suspended from the axial skeleton by a cradle-like hammock:

- Distal attachment (to pubic rami and urogenitaldiaphragm) is extremely strong.
- However, superior (to pericervical ring) and lateral attachments (to ATRF and ischial spines) are sites of potential weakness. When intact, these taut attachments function like a 'trampoline'. However, disruption along these weak points turns this 'trampoline' into a 'trapdoor', and a rotatory cysto-urethrocele may result.



Like hernia, the evolution from an initial tearing of the investing fascia to symptomatic prolapse reflects a combination of mechanical and metabolic events:

- The **primary causative factor** is a traumatic detachment of the suspensory mesentery from its normal skeletal attachment. This usually occurs during childbirth. The passage of the fetal head through the plane of least dimensions creates intense shearing forces, which tend to avulse the central bed of the anterior vaginal hammock from the pericervical ring (ie, a high transverse fascial defect) and from the ischial spine and ATRF (ie, a paravaginal fascial defect).
- The elastic tissues of young women initially compensate these 'site-specific' tears, keeping the effects subclinical. Progression to symptomatic prolapse generally reflects the operation of **secondary causative factors**, like aging, abdominal weight gain, chronic straining, and inherited or acquired collagen weakness in the adjacent connective tissue.

Traditional plication-type repairs address neither the mechanical nor the metabolic defects, and are hence only of value as symptom relieving measures. Conversely, resuture of the avulsed central hammock back onto the pericervical ring and ATRF is potentially curative.

However, the practical value of paravaginal repairs has been limited by:

- The elusive nature of the dissection,
- The irresolvable problem of suture line tension, which inevitably occurs the torn fascial edges are stretched back together after so many years, and
- Persisting collagen weakness within the connective tissues that are being sutured.

**Modern hernia principles** point to the value of a tissue augmentation material, both to create a 'tension-free' repair, and to re-strengthen adjacent connective tissue. Hernia surgeons have convincingly demonstrated that prosthetic hernioplasty is superior to non-augmented suture repair. However, "the vagina is not the abdomen"; alloplastic materials that are well tolerated by the tough fascia of the inguinal region can be problematic when placed between the fragile smooth muscle layers of the vaginal walls.

In general:

- Within static tissue sites, a narrow ribbon of polypropylene gives excellent strength and low morbidity (eg, TVT sub-urethral tapes).
- However, when used in larger volumes to bridge a fascial defect beneath a motile hollow viscus, polypropylene (eg, Gynemesh) has a high potential for erosion, scarring and pain. Moreover, graft softness and flexibility is more important than extreme tensile strength at these sites.
- Biological grafts with cross-linked collagen (eg, Pelvicol®) share the same limitations as synthetic grafts, but with a capacity for inflammatory autolysis and consequent support failure.
- Conversely, minimally altered biological grafts (eg, SurgiSIS®) create a genuine ingrowth of new Host Tissue.

## The composition of this new tissue layer depends on the source of the re-populating Host Cells.

Hence:

- A sheet of SurgiSIS® biomesh placed within the vesicovaginal space at colpexy would be expected to remodel into a fibrovascular tissue with high smooth muscle content.
- A sheet of SurgiSIS® biomesh sewn onto the obturator fascia at paravaginal repair would be expected to remodel into a much stronger, more highly collagenized tissue.

This study evaluates the **safety and efficacy** of vaginal paravaginal repair (VPVR) with a SurgiSIS® onlay graft, as a strategy to correct both the initiating mechanical defect and the secondary metabolic degeneration in the adjacent connective tissue

**MATERIAL AND METHODS**

This study presents a retrospective series of 39 consecutive women having complex cystoceles repaired over a two year period (2004 - 2005).

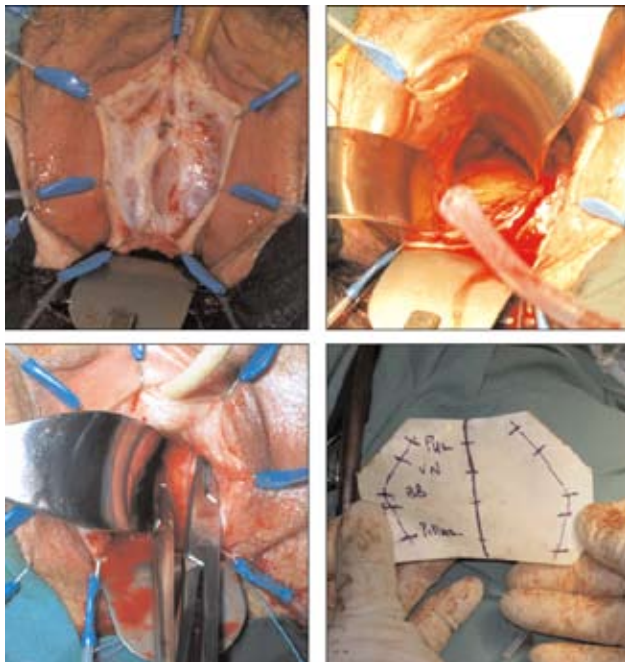
Main outcome measures were:

- (i) recurrent anterior prolapse;
- (ii) the occurrence of de novo urgency, voiding difficulty or dyspareunia; and
- (iii) all significant complications.

Key points in ensuring a **safe and effective operative technique** were:

- Routine use of the Lone Star retractor, to optimize exposure, and to create traction / counter-traction throughout the wound.
- Paravesical spaces were entered via an essentially bloodless embryologic cleavage plane between the endopelvic and parietal fasciae
- A 7x10 cm trapezoidal bridging graft of SurgiSIS biomesh was secured to the ATRF and obturator internus fascia along a broad interface.

This preliminary report focuses on **short term repair reliability** (ie, anatomic and functional outcome in year 1). Future statistical analyses will evaluate **repair durability**, as gauged by Kaplan Meier survival analysis.



**RESULTS**

1. 37 of 39 patients (94.9%) experienced outright or qualified anatomic and functional success.
2. Statistically significant reduction in pre-operative symptoms

- Bulge/prolapse awareness
  - Pelvic drag / backache
  - Urinary incontinence
  - Voiding difficulties
- } all P values <.05

3. Intraoperative complications were minimal, apart from two cystotomies that were immediately identified and repaired.
4. No graft-related morbidity has been seen.

**IMPLICATIONS**

The use of a biomesh bolster has shortened and simplified the operation of VPVR, without creating any graft-related morbidity. When this implant is placed securely against the parietal fascia, the tissue engineering properties of the SurgiSIS® xenograft induces the formation of a strongly collagenized layer of new Host Tissue. This new connective tissue re-establishes bladder support from arcus to arcus, and from pubourethral ligament to pericervical ring. Today, vaginal paravaginal repair with SurgiSIS® onlay graft has given 'gold standard' repair of the rotatory cysto-urethrocele.

