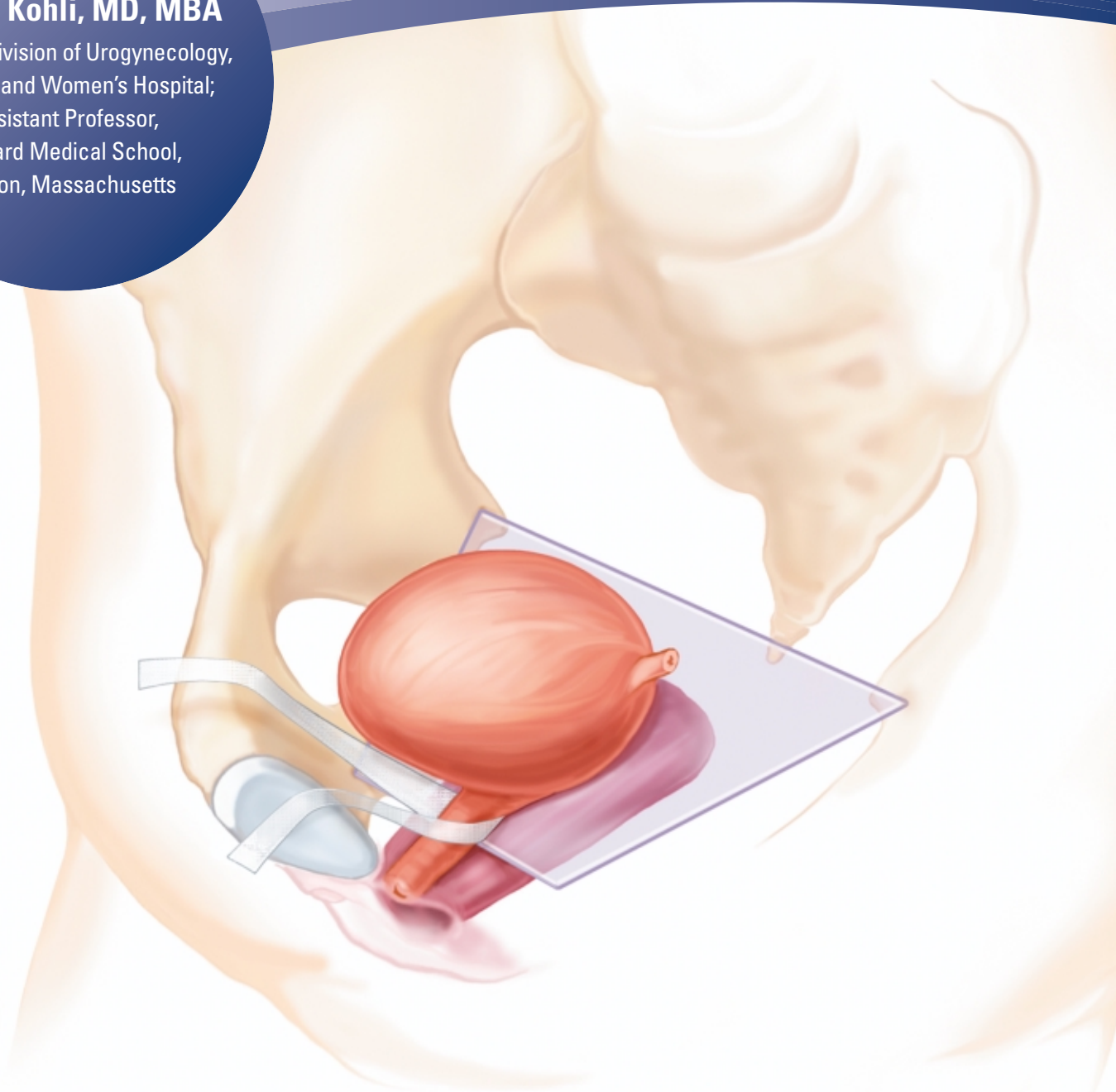


# A Minimally Invasive Approach to Anterior Wall Reconstruction for Incontinence and Prolapse: Four Corner Cystocele Repair with Repliform<sup>®</sup> Graft combined with Advantage<sup>™</sup> Mid-Urethral Sling

Boston  
Scientific

## Neeraj Kohli, MD, MBA

Director, Division of Urogynecology,  
Brigham and Women's Hospital;  
Assistant Professor,  
Harvard Medical School,  
Boston, Massachusetts



# Advantage™

## Mid-Urethral Sling System

### Neeraj Kohli, MD, MBA

Director, Division of Urogynecology, Brigham and Women's Hospital; Assistant Professor, Harvard Medical School, Boston, Massachusetts

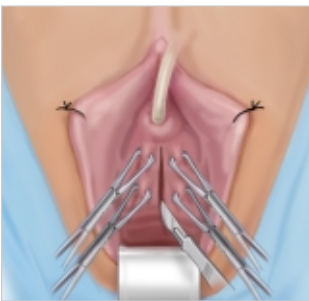
#### Introduction

The last decade has seen significant improvements in the surgical treatment of stress incontinence and pelvic prolapse, two commonly coexisting conditions. Use of synthetic materials and allografts to augment repairs has enabled surgeons to improve cure rates while innovative devices have made these surgical techniques more reliable, faster, and safer for both the seasoned and developing surgeon.

In patients with advanced cystocele/vault prolapse and incontinence, a four corner suspension technique with a minimally invasive midurethral sling is an excellent surgical option which can be performed safely and effectively. The procedure addresses both midline and lateral fascial defects causing cystocele by augmenting the anterior fascia while supporting the midurethra with a permanent backboard.

#### Surgical Technique

The procedure is begun with the patient in the lithotomy position using either candy cane or Allen stirrups based on surgeon preference. Care should be taken to avoid hyperflexion of the hips. In elderly patients or those with joint problems, it may be helpful to position the patient prior to anesthesia. The procedure can be performed under general anesthesia, spinal/epidural, or even local anesthesia with IV sedation.



#### Step 1

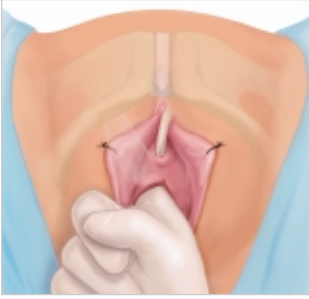
The anterior vaginal wall is grasped in the midline using a series of Allis clamps and the vaginal mucosa is injected with an anesthetic solution with epinephrine for hydrodissection, hemostasis, and postoperative pain control.

#### Step 2

An incision is made in the anterior vaginal mucosa from the bladder neck to the bladder base either at the vaginal apex or cervicovaginal junction.

#### Step 3

The edges of the incision are grasped with Allis clamps and the vaginal mucosa is then dissected off the underlying pubocervical fascia and cystocele using blunt and/or sharp dissection. To minimize risk of erosion of the underlying graft, the plane of dissection should be slightly deeper and the vaginal mucosa slightly thicker when compared to a traditional repair. The dissection is taken laterally to the paravaginal spaces which are assessed for paravaginal defects. If present, these will be corrected with the four corner suspension technique.



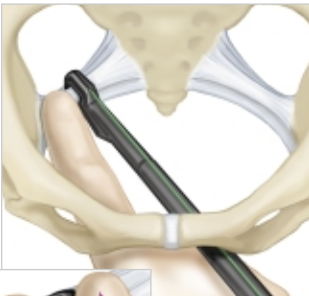
#### Step 4

The cephalad dissection is taken to the ischial spines bilaterally and the sacrospinous space is then carefully exposed bilaterally with blunt dissection via an anterior approach. Careful dissection in the proper plane will ensure hemostasis.



#### Step 5

The caudal dissection is taken to the pubourethral ligaments at the bladder neck if using distal suture attachment or the endopelvic diaphragm is sharply perforated and the retropubic space is entered if using bone anchor attachment. If a central defect (distention cystocele) is present, a traditional anterior colporrhaphy is performed with plication of the pubocervical fascia from the bladder neck to the bladder base using a series of interrupted permanent or delayed absorbable suture. Care is given to avoid excessive tension on the midline plication.



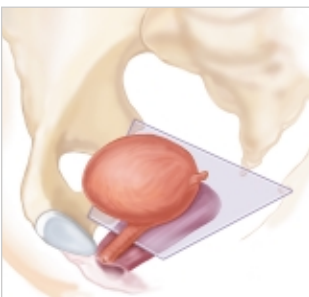
#### Step 6

The four corner suspension is begun by placing the cephalad attachment sutures through each sacrospinous ligament approximately 3 cm medial to the ischial spine using the Capiro® needle driver. The caudal attachment sutures are placed at level of the bladder neck using a Capiro needle device thru the pubourethral ligaments bilaterally. Alternatively, the Precision Speedtac® device can be inserted into the retropubic space to place bone anchors into the posterior pubic bone.



#### Step 7

A 5x10 cm piece of Repliform® human dermal allograft is prepared by immersion in an antibiotic solution for 10 minutes prior to use. The graft can be shaped in a trapezoid shape to suit the individual anatomy of each patient. It is important to keep the transverse width 10 cm to minimize tension on the graft as it extends the average distance of 6 cm between the sacrospinous ligament attachment sutures. Free needles are used to thread the cephalad and caudal attachment sutures to the corners of the graft and the sutures are then tied down resulting in the creation of the anterior fascia and correction of the distention/displacement cystocele. We recommend loose tie down of the sacrospinous stitches to minimize risk of nerve entrapment and postoperative buttock pain which can be related to sacrospinous suspension. A vault/uterine suspension can also be performed by attaching a delayed absorbable suture to the proximal edge of the graft on each side and then taking it thru the full thickness vagina or cervix. Tie down of this suture following mucosal closure will result in excellent apical support.



We do not recommend excision of the anterior vaginal mucosa as tension on the suture line over the allograft will increase risk of erosion. Any small redundancy will retract during the postoperative healing phase. Significant redundancy can be excised as long as tension free closure can be accomplished.

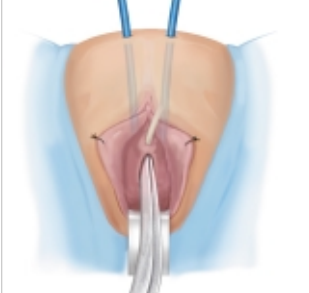
#### Step 8

The surgical site is irrigated with antibiotic solution prior to mucosal closure. Rectal exam and cystoscopy to confirm ureteral patency are recommended following the procedure. Postoperative vaginal estrogen following discharge is recommended.



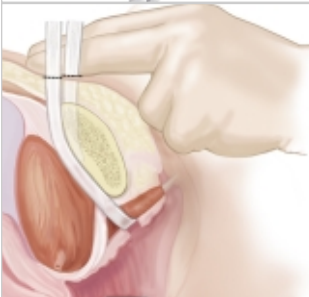
### Step 9

The Advantage™ mid-urethral sling procedure can be performed by extending the cystocele incision or through a separate 1.5 cm incision under the midurethra. A small paraurethral channel is created on either side and a 5 mm stab incision is made on either side in the suprapubic area just superior to the pubic bone.



### Step 10

The Advantage device with mesh assembly is inserted into the paraurethral tunnel, that is through the retropubic space, and exited through the ipsilateral skin incision. Care is given to insert the needle aiming at the ipsilateral shoulder and then to drop the handle of the needle during passage through the retropubic space so as to keep the needle tip from entering the peritoneal cavity. The sleeve is advanced, and the device is retracted. This is performed in identical fashion on the opposite side.



### Step 11

With both dilator tubes in place, cystoscopy is performed to exclude unintentional bladder injury—indicated by visualization of the blue tube in the bladder lumen. If bladder perforation has occurred, the tube is removed and the needle is passed slightly more laterally—24 hours of postoperative bladder drainage is recommended.

If cystoscopy is negative, the tubes are advanced and the sling procedure is completed. The sling is adjusted until there is a 2-3 mm space between the mesh and urethra. With an instrument between the mesh and urethra, the centering tab is removed and the sleeve peeled away. The vaginal mucosa is closed with a running 3-0 absorbable suture and the abdominal incision closed with steristrips or suture.

### Experience

In a one year period, we performed this technique and various modifications in over 75 patients with excellent results and minimal complications. Complications which can include postoperative voiding dysfunction, pelvic pain, graft exposure generally respond well to conservative treatment. We routinely offer graft augmentation to patients with recurrent prolapse, advanced cystocele, or significant risk factors for recurrence. A similar technique can be performed for the posterior segment. We are currently analyzing our long term data for presentation and publication.

# Boston Scientific

*Delivering what's next.™*

Boston Scientific Corporation  
One Boston Scientific Place  
Natick, MA 01760  
[www.bostonscientific.com](http://www.bostonscientific.com)

Ordering Information  
1.800.225.3226

Copyright © 2004 by Boston Scientific Corporation  
or its affiliates. All rights reserved.

MVU5090 5M 7/04-7/06

**Caution:** Federal Law restricts this device to sale by or on the order of a physician. Refer to the Directions for Use provided with this procedure for complete instructions, warnings and precautions prior to using this product.

Repliform is a trademark of LifeCell Corporation.