# Female Urology

# PREDICTING THE NEED FOR ANTI-INCONTINENCE SURGERY IN CONTINENT WOMEN UNDERGOING REPAIR OF SEVERE UROGENITAL PROLAPSE

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ABSTRACT

Purpose: We determined the indications for anti-incontinence surgery in continent women undergoing surgical repair of severe urogenital prolapse.

Materials and Methods: We prospectively evaluated 24 continent women referred for evaluation of severe urogenital prolapse. All patients underwent a meticulous clinical evaluation, including a complete history and physical examination, urinary questionnaire, voiding diary, pad test, cotton swab test, video urodynamics and cystoscopy. The urodynamic evaluation was repeated with prolapse repositioning by a fitted vaginal pessary. Surgical intervention was tailored according to urodynamic findings.

Results: Reduction of prolpase with a pessary unmasked sphincteric incontinence in 14 women (58%). Ten women with no urodynamic evidence of sphincteric incontinence underwent anterior colporrhaphy and no additional anti-incontinence procedure was performed. Mean followup was 44 months (range 12 to 96). None had postoperative stress incontinence but 1 (10%) had a recurrent grade 2 cystocele. The 14 remaining women with sphincteric incontinence after prolapse reduction underwent anterior colporrhaphy with a pubovaginal sling procedure. Mean followup in these cases was 47 months (range 12 to 108). In 2 patients (14%) stress incontinence developed postoperatively and 1 (7%) had a recurrent grade 3 cystocele. The incidence of urge incontinence did not appear to be significantly influenced by either surgical intervention. Overall 12 patients had preoperative urge incontinence, of whom 9 (75%) had persistent urge incontinence postoperatively. In another woman new onset urge incontinence developed.

Conclusions: Preoperative urodynamic evaluation with and without prolapse reduction is essential for making the correct diagnosis of masked stress incontinence in women with urogenital prolapse. The decision to perform a concomitant prophylactic anti-incontinence procedure should be tailored to individual urodynamic findings. Larger series and longer followup are needed to establish the most effective preventive procedure for this troublesome clinical problem.

KEY WORDS: prolapse, pessaries, urinary stress incontinence, vagina, urodynamics

Women with urogenital prolapse may present with a plethora of lower urinary tract symptoms, including irritative or obstructive symptoms as well as urinary incontinence. These symptoms may or may not be associated with prolapse. Urogenital prolapse may affect the urethra by pulling open the posterior urethral wall and causing sphincteric incontinence, by mechanically obstructing the urethra or by dissipating the effects of abdominal pressure on the urethra.[1–3] The functional consequences of these pathophysiological mechanisms are that urogenital prolapse may cause bladder outlet obstruction, impede voiding assisted by abdominal straining, mask sphincteric incontinence or cause sphincteric incontinence.[3–7] Furthermore, by an unknown mechanism prolapse may be associated with detrusor instability.

Continent women with severe urogenital prolapse may become incontinent after prolapse is reduced.[2–6] Stress incontinence in previously continent patients after vaginal surgery for prolapse is frustrating for the patient and physician. The use and choice of an anti-incontinence procedure are controversial in these cases. Several previously published studies have indicated various incontinence rates after different prophylactic anti-incontinence procedures but data on long-term followup in these series are sparse.[8–12] Furthermore, to prevent postoperative stress urinary incontinence some routinely perform an anti-incontinence procedure during prolapse repair.[8,9] We as well as others believe that this approach exposes many women to unnecessary morbidity.[6,10–12] We evaluate whether urodynamic studies with and without a vaginal pessary may predict the need for anti-incontinence surgery in continent women undergoing repair of severe urogenital prolapse as well as determine the long-term efficacy of prophylactic pubovaginal sling surgery.

## MATERIALS AND METHODS

This study involved a prospective evaluation of 24 consecutive continent women who underwent surgery performed by one of us (J. G. B.) who were referred for evaluation of severe grade 3 or 4 urogenital prolapse and lower urinary tract symptoms. These patients represent a subset of 81 consecutive, neurologically intact women with various degrees of genital prolapse, of whom 60 were previously reported on in

regard to the effect of genital prolapse on voiding.[13] Only clinically continent, asymptomatic women with severe urogenital prolapse who had undergone surgery were included in our study. Those who were clinically incontinent and symptomatic were excluded from study because they automatically underwent a pubovaginal sling procedure at prolapse repair. All patients underwent a meticulous clinical evaluation, including a complete history and physical examination, urinary questionnaire, voiding diary, pad test, cotton swab test, video urodynamics and cystoscopy.

Physical examination included evaluation of pelvic floor support with the patient in the lithotomy position and the head elevated to 45 degrees above the horizontal. A split speculum technique was used to evaluate the vaginal walls as well as the type and severity of urogenital prolapse. The degree of prolapse was assessed in accordance with the modified Baden and Walker classification.[14] With a comfortably filled bladder the patient was asked to cough or strain with increasing degrees of force. The inferior margin of the descent is above and at the hymenal ring, respectively, in grades 1 and 2 prolapse, protrudes beyond the ring in grade 3 prolapse and is well beyond the ring in grade 4.

Multichannel video urodynamics were done according to the recommendations of the International Continence Society.[15] However, when performing cystometry, contrary to these recommendations, patients were not instructed to inhibit voiding during the filling phase, but rather report sensations to the examiner. Vesical leak point pressure was evaluated at a volume of 150 ml. and defined as the lowest vesical pressure necessary to affect any degree of visible stress incontinence. If no leakage occurred, vesical leak point pressure was reevaluated at functional bladder capacity, defined as the largest voided volume on 24-hour voiding. If there was no leakage with the urethral catheter in place, the catheter was removed and abdominal leak point pressure was defined as the lowest abdominal pressure necessary to affect any degree of visible stress incontinence. At capacity patients were asked to void. Pressure flow studies with simultaneous video fluoroscopy of the bladder outlet were done and electromyography measurements were obtained. Urodynamics were repeated with the prolapse repositioned by a fitted vaginal pessary.

Because to our knowledge no standard urodynamic definitions of bladder outlet obstruction in women have been published, we defined urodynamic evidence of bladder outlet obstruction as a maximum flow of less than 15 ml. per second with maximum detrusor pressure at a maximum flow of greater than 25 cm. water. Patients with urodynamic evidence of stress incontinence were then categorized based on leak point pressure and the degree of urethral mobility as type 1—pressure greater than 60 cm. water and less than 30 degrees of mobility, type 2—pressure greater than 60 cm. water and greater than 30 degrees of mobility, and type 3—intrinsic sphincteric deficiency or pressure less than 60 cm. water regardless of the degree of urethral mobility. Surgical intervention was tailored according to urodynamic findings. Women with demonstrable sphincteric incontinence during prolapse repositioning underwent anterior colporrhaphy and pubovaginal sling creation, while those without sphincteric incontinence underwent anterior colporrhaphy only.

The pubovaginal sling procedure was performed in strict accordance with the previously described technique.[16] When the pubovaginal sling is created with concomitant cystocele repair, we recommend placing the sling through a slightly curved transverse incision over the vesical neck, as previously described, and closing it before making a separate vertical incision for cystocele repair. We believe that this modification decreases scar formation over the sling. Scar tissue leads to decreased sling elasticity, causing increased urethral compression. Anterior colporrhaphy was performed

through a vertical incision in the anterior vaginal wall extending from the bladder neck to the apex of the vaginal vault. Skin flaps were developed in a bloodless plane. The pubocervical fascia was identified by carrying dissection laterally to the arcus tendineus. Lateral defects were repaired using 2-zero polyglactin suture. The pubocervical fascia was plicated in the midline with interrupted 2-zero polyglactin sutures.

Patients were scheduled to be evaluated at 1 month, 6 months, 1 year and yearly postoperatively. At each visit a history, focused examination with a full bladder, voiding diary, pad test, uroflowmetry and post-void residual urine measurement were obtained. Surgical outcomes were evaluated by a chart review, including a 24-hour voiding diary and 24-hour pad test. Failure was defined as a less than 50% decrease in incontinence. Statistical analysis was performed using Student's t test for continuous data and the chi-square test for categorical data[17] with p <0.05 considered significant.

## RESULTS

We prospectively enrolled in our study 24 continent women with severe grade 3 or 4 urogenital prolapse. Mean patient age plus or minus standard deviation was 72 ± 9 years. Six patients had previously undergone transvaginal hysterectomy and in 1 and 2, respectively, the Marshall-Marchetti-Krantz and Pereyra procedures had been done. Urge incontinence was present in 12 patients (50%). Cystometry revealed normal bladder compliance in all cases. A total of 18 women (75%) had bladder outlet obstruction before prolapse repositioning. Overall obstruction resolved after prolapse reduction by a pessary. None of the patients without obstruction had bladder outlet obstruction after pessary placement.

Before prolapse reduction none of the women had overt stress incontinence but after prolapse reduction with a pessary 14 (58%) had stress incontinence. In all cases leak point pressure was 60 cm. water or less, that is sphincteric incontinence was present. We observed no significant correlation between urethral hypermobility and leak point pressure.

Ten women with no urodynamic evidence of sphincteric incontinence underwent anterior colporrhaphy without an additional anti-incontinence procedure. Mean followup was 44 months (range 12 to 96). In the 14 remaining women with sphincteric incontinence after prolapse reduction anterior colporrhaphy was performed with a pubovaginal sling procedure. Mean followup in these cases was 47 months (range 12 to 108). Postoperatively none of the women who underwent anterior colporrhaphy only had stress incontinence and 1 (10%) had a recurrent grade 2 cystocele, while 2 (14%) of those who underwent anterior colporrhaphy and a pubovaginal sling procedure had stress incontinence and 1 (7%) had a recurrent grade 3 cystocele. However, due to the relatively small number of patients in each group, statistical significance was not established.

Of the 12 women with urge incontinence preoperatively 9 (75%) had persistent urge incontinence postoperatively. The incidence of urge incontinence did not appear to be significantly influenced by either surgical intervention. Furthermore, new onset urge incontinence developed in only 1 patient. The table shows postoperative complications.

## DISCUSSION

Women with pelvic floor relaxation may have a plethora of urinary symptoms but the association of urogenital prolapse and symptoms is not well understood. In our study occult sphincteric incontinence was present in 58% of the women with severe urogenital prolapse. Our urodynamic results using leak point pressure testing corroborate previously published data. Using a Smith-Hodge pessary and pressure transmission measurements Bergman et al noted a 36% rate

*Postoperative complications*

| | Preop. Masked Incontinence + Anterior Colporrhaphy + Pubovaginal Sling | | Preop. Continence + Anterior Colporrhaphy | |
|---|---|---|---|---|
| Total No. pts. | 14 | | 10 | |
| Mean mos. followup (range) | 47 (12–108) | | 44 (12–96) | |
| No. pts. (%): | | | | |
| Stress incontinence | 2 | (14) | 0 | |
| Persistent postop./preop. urge incontinence | 7/8 | (87) | 2/4 | (50) |
| De novo urge incontinence | 1 | (7) | 0 | |
| Recurrent prolapse | 1 | (7) | 1 | (10) |
| Dyspareunia | 1 | (7) | 1 | (10) |
| Urinary retention | 1 | (7) | 0 | |

No patient had bladder injury.

of occult stress incontinence in 67 women with severe cystocele.[6] Similarly using a ring pessary to reduce prolapse Rosenzweig et al unmasked occult stress incontinence in 59% of 22 women with severe cystocele.[4] Ghoneim et al used a vaginal pack to unmask stress incontinence associated with urogenital prolapse.[18] In their series 11 of 16 women (68%) had stress incontinence after prolapse reduction.

Pelvic prolapse may be reduced by a split speculum, vaginal pack or vaginal pessary that may be conveniently and comfortably placed during urodynamics to create a facsimile of surgical correction. Mattox and Bhatia compared prolapse reduction by a Smith-Hodge pessary versus ring pessary versus a split Graves speculum during urodynamic testing.[19] They observed no difference in urodynamic parameters among the various reduction methods. We noted that the pessary neither added to nor caused urethral obstruction. None of the women had obstruction after pessary placement. Furthermore, we believe that the observed decrease in leak point pressure after pessary placement in our series refutes the pessary as an inadvertent cause of urethral obstruction.

Considerable controversy exists regarding the wisdom of performing a concomitant anti-incontinence procedure in women with severe prolapse in whom stress incontinence is not demonstrated preoperatively. Bergman et al evaluated 67 continent women with genital prolapse, of whom 24 had decreased abdominal pressure transmission to the urethra during prolapse reduction.[6] Surgical plans were tailored according to urodynamic findings. Therefore, these patients underwent needle suspension in addition to prolapse repair and none had stress incontinence postoperatively. Conversely Cross et al reported an 89% postoperative continence rate in a group of women with severe urogenital prolapse, of whom all underwent surgical repair of prolapse and concomitant pubovaginal sling creation.[8] Similar postoperative outcomes were reported by Raz at al in a mixed group of 46 continent and incontinent women with severe urogenital prolapse.[9] While such prophylactic anti-incontinence procedures in continent women with prolapse may be routine at some centers, we believe that the decision to perform concomitant urethropexy or sling creation in women with severe genital prolapse is most appropriately based on urodynamic and clinical findings with and without pessary prolapse reduction. Using this approach none of the women in our current series who only underwent colporrhaphy had stress incontinence postoperatively.

A plethora of surgical procedures have been devised for the treatment of overt stress incontinence but no single technique has met with widespread acceptance. Contrary data concerning the efficacy of various anti-incontinence measures in women with masked incontinence are sparse and controversial.[2, 6, 10–12] The traditional management of overt stress incontinence is based on urethral mobility, intrinsic sphincter function and surgeon experience with the procedure. Urethral hypermobility is a common finding in women

with severe urogenital prolapse. However, sphincteric incontinence may coexist with a well supported urethra or urethral hypermobility. Recently we reported a lack of correlation between urethral hypermobility and leak point pressure. Likewise no correlation was noted between sphincteric incontinence and the degree of prolapse.[13] Furthermore, in a previous study we showed that the pubovaginal sling is effective for all types of stress incontinence with acceptable long-term efficacy.[16] In our current series all cases of masked incontinence were associated with intrinsic sphincter deficiency. These women were considered at high risk for postoperative overt stress incontinence and, therefore, they underwent a concomitant prophylactic pubovaginal sling procedure during prolapse repair. Mean followup was 47 months (range 12 to 108). Postoperatively 2 women (14%) had stress incontinence and 1 (7%) had a recurrent grade 3 cystocele. These failures occurred early in our series and, therefore, they may represent learning curve results.

Since the introduction of the sling operation in 1910, the procedure has been associated with a high incidence of urinary retention and new onset detrusor instability. We have previously shown that not attaching the sling to the rectus fascia and tying it without any tension have had a significant impact on decreasing the poor outcome originally associated with this procedure.[16] In that series permanent urinary retention developed after surgery in 4 patients (2%), and 2 underwent concomitant grade 3 or 4 cystocele repair. Operative findings at urethrolysis in these 2 patients revealed a sling entrapped in scar tissue. We have not observed scarring of the sling in other cases of urethral obstruction at reoperation. We concluded from this experience that excessive scar formation was due to performing the sling procedure and anterior colporrhaphy through a single incision. Subsequently, when a pubovaginal sling is created at the same time as grade 3 or 4 cystocele repair, we place the sling through a slightly curved transverse incision over the vesical neck and close it before making a separate vertical incision that does not communicate with it. We believe that this modification decreases scar formation over the sling and scar tissue leads to decreased elasticity of the sling, causing increased compression of the urethra. No cases of permanent retention have occurred since making this modification.

## CONCLUSIONS

The reduction of urogenital prolapse during urodynamic evaluation revealed occult sphincteric incontinence in 58% of women with severe urogenital prolapse. Reduction by a ring pessary is easy to perform, convenient and comfortable in most patients, and most probably creates a facsimile of surgical correction. Preoperative urodynamic evaluation with and without prolapse reduction is essential for making the correct diagnosis. The decision to perform a concomitant prophylactic anti-incontinence procedure should be tailored to individual urodynamic findings. Larger series and longer followup are needed to establish the most effective preventive procedure for this troublesome clinical problem.

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