

## Case Report

# Stress Urinary Incontinence and Genital Trauma After Female Pelvic Trauma

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**Abstract:** Combined stress urinary incontinence (SUI) and genital prolapse after fracture of the female pelvis has not been well described to date; four such cases are reported. Three of the patients had undergone reconstructive urogynecologic surgery prior to referral. None of the patients had a history of urinary incontinence or genital prolapse prior to injury. In order to correct persistent urinary incontinence and prolapse the following operations were performed: pubovaginal sling and transvaginal cystocele repair, Raz needle suspension and rectus muscle graft to the pelvic floor followed by a unilateral Burch colposuspension. On follow-up at a mean interval of 14.2 months (range 12–17), 2 have mild SUI and all 4 are without significant genital prolapse.

**Keywords:** Genital prolapse; Pelvic trauma; Pubovaginal sling

## Case 1

A 52-year-old gravida 4 para 4 woman presented with severe SUI 1 year after a serious pelvic injury which was the result of a horse-riding accident. Her injuries included a large anterior vaginal wall laceration involving the full length of the urethra with partial loss of the urethral floor, herniation of the bladder base through a large defect in the pelvic floor, and a compound fracture dislocation of the pelvis with wide diastasis of the pubic symphysis. An intravenous pyelogram and retrograde cystogram performed at the time of injury revealed normal upper tracts and no extravasation of contrast from the bladder. Primary surgical repair involved a temporary colostomy, closure of the vaginal laceration and the formation of a neourethra. The latter was achieved by approximating the retracted urethral edges over a size 24 Fr Foley catheter. Additional bladder drainage was provided through a suprapubic catheter. The fractured pelvis was partially realigned by means of an external fixation device. In her previous medical history the patient had undergone a total abdominal hysterectomy and right salpingo-oophorectomy.

Fluorourodynamic evaluation at 1 year revealed a grade 4 cystocele and type II SUI. The pubic bones were still widely separated. Surgical reconstruction consisted of a Raz needle suspension and a rectus abdominus muscle graft to the pelvic floor. The graft was interposed between the separated pubic rami in order to close the residual pelvic floor defect. It was not possible to perform a rectus fascial sling due to a large triangular defect in the rectus sheath, extending from the umbilicus to the widely separated symphyseal margins. A Marlex mesh graft was used to close this defect and to buttress the graft harvest site. Three years later this

## Introduction

Injury to the female urethra resulting in stress urinary incontinence (SUI) is increasingly recognized after serious pelvic trauma [1–3]; the problem of trauma-induced genital prolapse, however, has received very little attention to date; we describe our experience in four such cases. All patients were assessed and managed by both urologists and gynecologists working closely together. None of the patients had a history of SUI or genital prolapse prior to injury.

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patient was noted to have a grade 3 cystocele, partial descent of the vaginal apex and a moderate-sized rectocele. Vaginal examination also confirmed complete separation of the pubocervical fascia from the right pelvic side wall. Fluorourodynamic evaluation revealed type II SUI. The patient underwent a unilateral Burch colposuspension. In view of her previous surgery a Gibson incision was used to gain access to the space of Retzius. The vagina was sutured to the pelvic side wall and ileopectineal ligament on the right side. A posterior colpoperineorrhaphy was also performed. Fifteen months after her last surgery she is dry except after strenuous coughing, and has a grade 1 cystocele.

## Case 2

A 41-year-old gravida 5 para 2 woman was reviewed 9 months after a motor vehicle accident in which she sustained a pelvic fracture. Urologic injuries were not noted on her initial presentation; her fracture did not require surgical correction. On mobilization after her injury she complained of SUI and a large cystocele. Ten years previously she had undergone a total abdominal hysterectomy and bilateral salpingo-oophorectomy.

Fluorourodynamic evaluation revealed a grade 4 cystocele and type II SUI with vigorous urethral hypermobility. A large defect was palpable in the anterior pelvic floor. The patient underwent a pubovaginal sling and transvaginal cystocele repair. Fluorourodynamics 14 months later revealed detrusor instability without SUI or cystocele formation. The patient is currently managed with imipramine and a timed voiding schedule.

## Case 3

A 27-year-old gravida 0 woman was referred for assessment of urinary incontinence and vaginal prolapse. Fifteen months previously she had been involved in a motor vehicle accident in which her pelvis was fractured. Radiologic evaluation revealed an 8 cm separation of the symphysis pubis, with posterior shift of the right hemipelvis. An intravenous pyelogram and retrograde cystogram were both normal, except for a grade 3 cystocele. The pelvic fracture was treated with an external fixation device. Ten months later this patient underwent a bladder-neck needle suspension; her incontinence returned shortly after surgery.

Fluorourodynamic evaluation in our clinic revealed a grade 4 cystocele and type II SUI. Subsequently the patient underwent a pubovaginal sling and transvaginal cystocele repair. Repeat fluorourodynamics 17 months later demonstrated type I SUI. In addition, the pubovaginal sling was intact and there was no recurrence of her cystocele. The patient is presently managed with imipramine, with improvement in her SUI.



Fig. 1. Cystogram at time of injury, showing severe diastasis of the pubic symphysis (Case 1).

## Case 4

A 35-year-old gravida 1 para 1 woman presented 15 years after a pelvic fracture with wide pubic diastasis as a result of a motor vehicle accident. Her injury did not require surgery and was managed with a pelvic sling for a period of 3 months. Radiologic evaluation of her urinary tract did not reveal any evidence of injury. She complained of SUI after her injury, and was noted to have a large cystocele. Two years later she underwent a cystocele repair and Kelly suburethral plication. Her urethra and bladder were noted to be displaced laterally to the right of the midline, and dense adhesions were encountered during the course of the dissection. Her incontinence and prolapse recurred within 1 year of surgery. Five years later she underwent a vaginal hysterectomy and cystocele repair for procidentia and vaginal prolapse. Two years later a Marshall–Marchetti–Krantz operation was attempted for recurrent SUI. Due to the distorted anatomy and adhesions sutures were inadvertently placed in the bladder. A cystotomy was performed to locate and remove the suture material and a Raz needle suspension was performed. Within 6 months of surgery both the SUI and cystocele had recurred.

Fluorourodynamic evaluation in this clinic revealed type II SUI, with breakdown of the Raz suspension on the right side. In addition there was a grade 2 cystocele. The patient subsequently underwent a pubovaginal sling and transvaginal cystocele repair. Nineteen months later she is completely continent and has a well supported vagina.

## Discussion

The incidence of direct urethral injury in fractures of the female pelvis is approximately 5% [1,2], partial disruption being the most common type of injury. A primary repair is generally recommended in these cases; however, despite good anatomic reapproximation SUI may ensue in up to 50% of these patients [2]. Woodside

has reported SUI after indirect urethral injury associated with pelvic fracture, successfully managed with pubovaginal sling suspension [3]. Proximal urethral denervation and disruption of the urethral supports and mucosal coaptive mechanism are the most likely etiologic factors in this type of SUI. Both direct and indirect urethral injuries are almost invariably associated with diastasis of the pubic symphysis. The association with genital prolapse is not widely recognized. Disruption of the bony pelvis, visceral fascial supports and the muscular pelvic floor may result in significant prolapse, particularly cystocele formation, in addition to SUI, as in these 4 patients. Whereas direct urethral and bladder injuries may require immediate repair, urogynecologic reconstructive surgery may otherwise be best delayed until after orthopedic stabilization. In view of the varying degrees of anatomic distortion found in these patients, reconstructive surgery requires individualization. In 3 of the patients reported, a pubovaginal sling and transvaginal cystocele repair provided a good anatomic result, with just mild SUI in one patient. In addition to stabilizing the urethra, the sling provides additional support for the cystocele repair. Although the fascial attachments to one or both pelvic side walls are usually disrupted in these cases, retropubic colposuspension is not always feasible because of anatomic distortion. Similar difficulties may equally apply to

artificial sphincter insertion. Bladder-neck needle suspension appears to be less effective for this type of injury: it was performed in 3 of the 4 patients reported, 2 of whom required further surgery for significant SUI and cystoceles, which recurred shortly after suspension. With severe disruption of the pelvic floor, a pedicled muscle graft may be necessary to effectively close the defect, as in Case 1. Patients with residual incontinence despite adequately functioning slings may be suitable candidates for transurethral collagen injection in the future. Where there are no fertility requirements, uterine prolapse is best treated with vaginal hysterectomy and McCall culdoplasty. Given the complex nature of some urogynecologic injuries associated with female pelvic trauma, they are best managed by gynecologists and urologists working closely together.

## References

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## Review of Current Literature

### Management of Urinary Calculi During Pregnancy

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*J Urol* 1992;148:1072-1075

Twenty-nine patients with documented urinary calculi presented in the second (12) and third (17) trimesters for management. The presenting complaint was flank pain in 28, and lower quadrant pain in 1 with a pelvic kidney. Only 1 patient had infection. Twenty-one patients had a solitary stone, and 8 had multiple stones. Symptoms were caused by stones in the distal ureter in 11, in the proximal ureter in 7, the ureteropelvic junction in 4, and the renal pelvis in 7. Initial conservative treatment resulted in the successful treatment of 16

patients. Three patients had basket extraction, 8 had an internal stent placed and were treated definitively after the pregnancy, and 2 had a percutaneous nephrostomy tube placed.

### Comment

Pregnant patients presenting with severe symptoms of flank pain need to be assessed initially for renal colic versus pyelonephritis. Examination of the urine showing RBCs without evidence of bacteria or WBCs points to calculus disease. Antibiotics are not needed, and the presence of obstruction can be assessed by ultrasound. The ureters in pregnancy may be dilated normally, so it is important to be aware of this diagnostic difficulty. A plain X-ray and a 20-minute film after injection of contrast may be needed for diagnosis. The urologist and the radiology subspecialist may need to be consulted in these cases.