

Evaluation of Ureteral Patency in Patient after Prolapse Surgery with End Stage Renal Disease: A Case Report

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Abstract

Background: Pelvic floor reconstruction can result in obstruction of the ureters. In order to confirm ureteral patency, an intraoperative diagnostic cystoscopy is indicated.

Case Presentation: This case describes a 48-year-old multiparous patient with history of end stage renal failure requiring hemodialysis. She was presented with recurrent cystocele and mix urinary incontinence to City of Hope medical center in Duarte, California, United States in February 2016. The patient underwent transverse cystocele repair for pelvic organ prolapse. When intraoperative cystoscopy was non-diagnostic, retrograde intubation of the ureteral orifices confirmed patency.

Conclusions: This case raises awareness on the lack of visualization of ureteral flux during conventional cystoscopic evaluation in patients with renal failure undergoing pelvic organ prolapse repair, while also emphasizing the importance of confirming ureteral patency via retrograde ureteral intubation when cystoscopy is non-diagnostic.

Keywords: Pelvic Organ Prolapse, Renal Failure, Hemodialysis, Ureteral Patency, Cystoscopy

1. Introduction

Pelvic organ prolapse is the abnormal descent of the pelvic organs from their normal position in the pelvis. The pelvic structures that may be involved include the uterus (uterine prolapse) or vaginal apex (apical vaginal prolapse), anterior vagina (cystocele), or posterior vagina (rectocele). Many parous women may have some degree of prolapse without specific symptoms, however others may show symptoms such as feeling of vaginal fullness or pressure, back pain, coitus difficulty, lower abdominal discomfort, urinary incontinence and defecation difficulties that require intervention. Pelvic organ prolapse is a common condition with over 200,000 inpatient surgical procedures performed in the United States annually (1, 2). It is estimated that 25% of adult women in the United States have ≥ 1 pelvic floor disorders, and that 1 in 4 women will undergo surgery for stress urinary incontinence or pelvic organ prolapse during their lifetime (1). Given the proximity of ureter to pelvic organs there is a known risk of ureter injury during complex reconstructive pelvic surgery. In addition the anatomic distortion of ureter caused by the prolapse can increase the risk of this injury. Unrecognized ureteral injury can cause prolong postoperative morbidity including fistula and renal failure and management would be more difficult to treat (3).

The crude rate of ureteral injury during gynecologic

surgery is 16 - 29 per 1000 surgeries (4). Vaginal surgery for anterior and apical pelvic organ prolapse is associated with an intraoperative ureteral obstruction rate of 5.1% (5). In one previous study bleeding, enlarged uterus, endometriosis, adhesions, and obesity were contributing factors to the urinary tract injury. However, in over 40% of all ureteric injuries, predisposing factors can not be identified and happen during routine operations (6). After reconstruction, intraoperative diagnostic cystourethroscopy is recommended to evaluate for the patency of the ureters, to confirm bladder integrity, and to rule out the presence of a suture in the bladder (7, 8).

Prompt diagnosis of ureteral injury plays a significant role in management of such injuries, since intraoperative repair is much more easier than postoperative repair. Intraoperative use of cystoscopy is one of the most commonly used method for detection of ureteral patency. It is able to detect 90% of ureteral injuries. Dain et al. reported the association between Anterior colporrhaphy and significant caudal and lateral displacement of both ureteral orifices. They suggested cystoscopy with intravenous dye injection and placement of ureteral catheters before and after the surgery (9). Kwon CH et al. reported intraoperative cystoscopy is able to detect unsuspected operative injuries in 2.9% of urogynecologic and major vaginal reconstructive procedures (10). Siff LN et al. described 10% dextrose cystoscopy fluid as a safe and effective method in identify-

ing ureteral patency (11). In patients with end stage renal disease requiring hemodialysis evaluation of ureteral patency during reconstruction surgery plays a fundamental role since to preserve residual renal function. We present a case involving a patient with end stage renal disease requiring hemodialysis who underwent transverse cystocele repair for pelvic organ prolapse, and we address management strategies on the evaluation of ureteral patency.

2. Case Presentation

A 48-year- G7P7 obese woman with recurrent pelvic organ prolapse and mixed urinary incontinence for five months presented with recurrent cystocele to the level of the hymen. She was referred to City Of Hope medical center in Duarte, California in United States at 2016. Previously in 2008, she underwent robotically assisted cervico-sacrocolpopexy and rectopexy with mesh for uterine and rectal prolapse. Her past medical history included hypertension and end-stage renal disease requiring hemodialysis three times per week; despite hemodialysis, she voided small volumes daily.

Her pelvic examination demonstrated a normally appearing cervix and normal sized uterus. She had clinical stage II pelvic organ prolapse, which was noted during Valsalva as the anterior compartment prolapsed to the level of the hymen, while the cervix was adequately supported half way above the hymen. The posterior compartment was well supported. However, rectal mucosal prolapse was present with straining for which she was evaluated by Colorectal Surgery. A combination surgical repair by both services was subsequently scheduled. A transverse cystocele repair to suspend the prolapsed anterior compartment to the cervix as well as a Delorme submucosal resection of the rectum with plication of the underlying muscle for the rectal mucosal prolapse was planned.

Intraoperatively, she underwent an uncomplicated anterior repair and apical suspension of the anterior compartment to the cervix. A cystourethroscopy was then performed, and the bladder was retrogradely filled with a 50% dextrose solution and saline to evaluate ureteral flux. However, bilateral jets of flow were not visualized, which was likely secondary to her end stage renal disease. Of note, total urine output during the anterior repair was less than 20 mL. When flow was not appreciated, an intraoperative urology consult was obtained to intubate the ureteral orifices. Bilateral retrograde ureteral catheters were easily advanced to 15 cm without difficulty and removed as an obstruction was not present. The colorectal service performed an anoscopy and noted a short segment prolapse with decreased sphincter tone. However, repairs were not performed due to an incomplete bowel preparation.

Postoperatively, she was hospitalized one night for hypertension and was discharged the following morning with a Foley catheter without complications. She resumed hemodialysis as regularly scheduled. She returned in two days for a voiding trial, and the Foley catheter was removed. Upon reevaluation, she stated her prolapse symptoms were resolved.

3. Discussion

Ureteral injury can occur after any gynecologic procedure, especially after pelvic floor reconstruction for prolapse. The surgical technique of transverse cystocele repair with uterine preservation using native tissue was based upon the repairs as described in Huffaker et al. (12). In this retrospective study, the plicated pubocervical connective tissue was suspended to the cervical stroma. Patients who underwent these transverse cystocele repairs with uterine preservation were shown to have high frequency of anatomic success without intraoperative complications.

In our patient with significant residual renal function despite known renal failure, evaluation of ureteral patency was of utmost concern to prevent any worsening of renal function. In patients with renal failure, conventional non-invasive techniques to visualize urine flux may not suffice, such as cystoscopic evaluation after intravenous dye injection of indigo carmine and retrograde bladder distention with dextrose solution. Additional studies to evaluate ureteral patency include fluoroscopic techniques, such as intravenous pyelogram and retrograde ureterogram, but these expose patients to low levels of radiation. Even though routine techniques were attempted during this case, visualization of urine flow was not possible, likely secondary to low levels of urine production and her underlying renal failure. Instead, retrograde ureteral catheter intubation was necessary to confirm patency.

The strong points of our study are presenting a unique and rare case, a new observation that has not been reported in literature and generating a hypothesis regarding a specific situation of end stage renal disease and reconstructive surgery for pelvic organ prolapse and significance of, ureteral patency. We found the case educational and worthy of being reported. The weak point of observation is unable to deliver quantitative data and allow generalization to all cases of pelvic organ prolapse.

A literature search does not reveal any case reports of patients with renal failure undergoing prolapse repair surgeries. We have found our case to be unique in the evaluation of ureteral patency in a patient with low volume urine production. Patients with end stage renal disease undergoing pelvic organ prolapse repair surgery may re-

quire retrograde ureteral catheter intubation to confirm patency.

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Footnote

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