

Cystectomy Without Urethrectomy Does Not Improve Pelvic Pain In Patients With Refractory Painful Bladder Syndrome: A Case Series With Review Of The Literature

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Citation

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Abstract

Interstitial cystitis is characterized by suprapubic pain, urinary urgency and frequency. In cases refractory to medical management, cystectomy has been considered as a form of treatment. However, cystectomy without urethrectomy can result in persistent pelvic pain post operatively. We present two cases where cystectomy was performed without urethrectomy. Both patients complained of persistent pelvic pain despite cystectomy. We suggest that if cystectomy is considered in the treatment of refractory interstitial cystitis that urethrectomy should also be included as part of the procedure.

INTRODUCTION

Interstitial cystitis is a chronic and sometimes debilitating disorder predominantly affecting middle-aged women. It is characterized by suprapubic pain, urinary frequency, and urgency that may cause a patient to become socially incapacitated due to the severity of symptoms (1,2). Currently, the defining etiology and pathogenesis of bladder pain syndrome remains largely unknown. The prevailing theories includes a defect in the mucopolysaccharide layers on the luminal epithelial surface of the bladder, a toxic unspecified substance dissolved in the urine, and neuroendocrinological and autoimmune mechanisms (3,4). A thorough workup from the National Institute of Health summary of interstitial cystitis includes history and physical, urine analysis, serum chemistries, histology, cytology, and cystoscopy with urodynamics [25].

Treatment of interstitial cystitis is mostly noncurative because of its unknown etiology, yet a variety of therapies have been advocated for in the early stages of the disease, including immunosuppression with systemic corticosteroids and azathioprine, cystodistention under general anesthesia, oral sodium pentosanpolysulphate, intravesical instillation of dimethyl sulfoxide, and amitriptyline (5-9). In most patients these treatments only achieve partial relief of symptoms while others are completely refractory to these therapies. In some cases, despite treatment, there is a progression of the disease, causing a gradual decrease in bladder capacity

culminating in fibrotic contracture of the bladder, which is associated with ulceration of the urothelium known as Hunner's ulcer [10]. Hunner or classic interstitial cystitis as defined by Peecker, Aldenborg and Fall as a "single or multiple reddened mucosal areas with small vessels radiating toward a central scar, fibrin deposit or coagulum, site rupture with increased bladder distention and petechial oozing of blood from the ulcer and mucosal margins" [31]. Other potential causes of pain will need to be elucidated include calculus disease, neoplasm (carcinoma in situ of the urinary bladder/pelvic tumors), infectious processes and/or neurological disorders [13].

In severe cases of bladder pain syndrome that continue to be refractory to conservative modalities, major surgery involving an urinary diversion can be considered. Surgical procedures such as partial, supratrigonal, and complete radical cystectomies, as well as enterocystoplasty and urinary diversion by ileal conduit are utilized, with the theory that diverting urine away from the bladder or removing the painful bladder may relieve the symptoms (11,12). However, it is understood that no operation can guarantee complete relief and it is our experience that some patients continue to experience their incapacitating symptoms after undergoing a cystectomy with urinary diversion.

CASE REPORTS

CASE #1

A 43-year-old female with refractory urgency, frequency, persistent pelvic pain/pressure status, and post-cystectomy with ileal conduit urinary diversion, was first seen for treatment of her persistent chronic pelvic pain. The procedure did not include urethrectomy. Her pain was episodic, and she also complained of pelvic floor muscle spasms and irritable bowel activity with alternating constipation and diarrhea. Her surgical history was significant for lipoma removal at L5-S1, hysterectomy, and cholecystectomy. Medications included tramadol for pain control. She had no known drug allergies. Her family history was that of no abnormalities. The patient had been a 1 pack/day smoker for 20 years.

The patient's physical examination showed a cachectic female who appeared older than the stated age by approximately 15 years. Her abdomen was soft, nontender, and nondistended, with no suprapubic fullness. She had positive bowel sounds in all four quadrants and a healed midline scar, as well as an ileal conduit stoma in the right abdomen. The skin and lymphatic and musculoskeletal systems were within normal limits. A genitourinary examination showed an intact urethra with anterior vaginal wall tenderness. No evidence of a pelvic floor prolapse was identified.

A computed tomography (CT) scan of her abdomen and pelvis, preformed with and without contrast, showed no evidence of abdominal or pelvic pathologic problems. Also, a colonoscopy showed no evidence of polyps or mass lesions in the colon or rectum.

The patient underwent a sacral neuromodulation trial with bilateral lead placement in the S3 foramina. She had a 75% improvement in her pelvic pain. Her tramadol dose of 50-mg 4 times daily was reduced to 25 mg daily. The patient underwent placement of the implantable pulse generator and initially did well for 8 months. At her 8-month follow-up visit, she began to develop a worsening of her pelvic pain to 6 out of 10, despite excellent functioning of the InterStim® device. An examination showed no evidence of device infection. A review of the device and x-rays showed good lead placement and excellent battery function, and all circuits were functional. The patient then wanted the device removed because of lack of efficacy, despite having a 30% improvement in pain when compared to her first visit. Her

pelvic pain persisted despite the above treatments.

CASE #2

A 62-year-old female with refractory urgency, frequency, persistent pelvic pain/pressure status, and post-cystectomy with ileal conduit urinary diversion, was first seen for treatment of her persistent chronic pelvic pain. The procedure did not include urethrectomy. Her pain was episodic, and she also complained of pelvic floor muscle spasms and irritable bowel activity with alternating constipation and diarrhea. Her surgical history was significant for cystectomy with ileal conduit urinary diversion. Medications included oxycodone for pain control. She had no known drug allergies. Her family history was that of no abnormalities. The patient had been a nonsmoker.

The patient's physical examination showed a well developed female who looked to be her stated age. Her head was normocephalic, atraumatic; neck was supple with no jugular venous distention; and the extraocular muscles were intact. Also, her heart sounds were S1 and S2 with regular rate and rhythm; respirations were clear to auscultation bilaterally; and no wheezes, rales, or rhonchi auscultated. Her abdomen was soft, nontender, and nondistended, with no suprapubic fullness. She had positive bowel sounds in all four quadrants and a healed midline scar, as well as an ileal conduit stoma in the right abdomen. The skin and lymphatic and musculoskeletal systems were within normal limits. A genitourinary examination showed an intact urethra with anterior vaginal wall tenderness. No evidence of a pelvic floor prolapse was detected.

A computed tomography (CT) scan of her abdomen and pelvis, preformed with and without contrast, showed no evidence of abdominal or pelvic pathologic problems. Also, a colonoscopy showed no evidence of polyps or mass lesions in the colon or rectum.

She refused therapy offered to her which included: (1) trial of sacral neuromodulation or (2) urethrectomy. Her pelvic pain persisted despite the above suggestions.

DISCUSSION

Interstitial cystitis is an elusive disease without a consistently successful treatment. In many patients, conservative therapy is often effective in ameliorating the symptoms, however some continue to remain refractory to non-invasive therapies. In the non-responsive patients, the most debilitating symptom is frequently the pain arising

from the inflamed bladder and any invasive surgical procedure should aim to eradicate this pain. A number of different procedures have been used, including using segments of bowel to reconstruct the lower urinary tract in order to replace the diseased bladder tissue (13).

Some of the earliest surgical options included bilateral S3 neurectomy. Meironsky reported on 3 patients with symptoms of chronic interstitial cystitis for 5+ years and saw a cessation of their symptoms (urgency, frequency, nocturia, intractable pain, etc.) in addition to a bladder capacity that doubled one year following the surgery [23]. Bohm and Franksson suggested in a later study that the sacral nerve roots could be the origin of the chronic pelvic pain [24].

Bladder augmentation or orthotopic bladder substitution is widely viewed as the most suitable technique for the treatment of intractable interstitial cystitis when surgical reconstruction is deemed necessary. Concerning the surgical approach to the detrusor, there is nearly general agreement that at least the supratrigonal part of the bladder should be resected to avoid unfavorable outcomes (14). Additionally, some perform a subtrigonal resection as well (15). The advantage of a trigone-preserving procedure is that the ureteral orifices are left in-situ preserving the natural antireflux mechanism and avoiding complications associated with ureteral reimplantation. Generally, surgical failure to improve the symptoms of a patient with interstitial cystitis is thought to be due to inflammation of the remnant trigone (17-19). Linn et al. reported on 23 patients (22 female and 1 male) with 17 undergoing subtrigonal cystectomy and ureteral reimplantation and 6 undergoing supratrigonal cystectomy. Those patients with subtrigonal cystectomy were followed for a mean of 94 months and 2/17 (12%) patients reported all symptoms persisting resulting in a poor outcome. The patients that underwent supratrigonal cystectomy all reported good outcomes (6/6) but were only followed for a mean of approximately 32 months. All patients had bladder capacity < 400cc that had successful outcomes. [16].

An area of interest that has gained favor on whether or not to perform extensive surgery is bladder capacity under anesthesia. According to Hohenfellner, anatomical bladder capacity was determined by pressure flow studies under anesthesia to determine cessation of flow at 80 cm H₂O [13]. Nielson et al. had successful surgical outcomes with 2 of their 8 of their patients undergoing bladder augmentation with supratrigonal cystectomy and Mainz

Ileocecocolostomy defined as “relief of symptoms, stable renal function and an intact urinary tract reconstruction.”

The 2 patients that were deemed cured were found pre-operatively to have a bladder capacity of 200 cc at a pressure of 80 cm water under anesthesia and those that were not had bladder capacities ranging from 400-675 cc. 5/6 with reoccurrence of their symptoms then went on to require cystectomy with urinary diversion due to failure of clean intermittent catheterization (secondary to urethral pain), chronic indwelling catheter, urethrotomy, and/or colposuspension. These authors did not provide rationale regarding whether or not urethrectomy or anterior vaginectomy being preformed was included. The major focus of the paper was to determine if mastocytosis could be used as a histological factor in determining response to partial cystectomy with enterocystoplasty. They found no difference in the mast cell density in the 2 patients with resolved symptoms vs. those patients that failed the original surgical treatment and required cystectomy with urinary diversion [26]. In a more paper by Kochakarn et. al. cystectomy with ileoneobladder (with sectioning of the urethra below the bladder neck to help preserve continence) was performed in patients with a mean age of 46 years in 35 patients, all of which were reported good outcomes and had on average a bladder capacity of 170.6 (awake cystometric bladder capacity) [28]. Rossenberger et al. reported on 28/34 patients with classic (Hunner-type) IC had relief from their symptoms after undergoing either noncontinent ureteroenterocutaneostomy, supratrigonal cystectomy and ileocystoplasty, orthotopic diversion, cecocystoplasty, or Kock pouch with their preoperative bladder capacity under anesthesia being 175. 4/6 then had successful outcomes after they either underwent a diversion procedure or transurethral resection of ulcers in the remnant of the trigone. This is in comparison to 10/13 patients that did not have resolution of their symptoms sub-typed into nonulcer IC and where their preoperative bladder capacity under anesthesia was found to be on average 650 cc. They suggested that supratrigonal cystectomy with ileocystoplasty should be the treatment of choice for those patients requiring a reconstructive option after failing conservative treatment [30]. Also seen in an earlier study by Peeker et al. 10/10 had a beneficial ileocystoplasty (determined to have Hunner with bladder capacity under anesthesia 50-280cc under anesthesia) as opposed to those that failed, 3/3 (nonulcer with bladder capacity 325-650cc), requiring trigonal resection with Kock pouch for symptom relief [31].

Baskin and Tanagho concluded that even with removal of all pelvic organs (bladder, uterus, ovaries, fallopian, and in most the urethra) all 4 of their patients with severe pelvic pain had continuation of their symptoms despite drastic surgical procedures. The patient's ages ranged from 19-38 and failed many conservative treatments with one patient being diagnosed at age 16. They did not include bladder capacity under anesthesia in their case series and added that 3 of 4 patients had continent urinary diversion and reported problems with the reservoirs and suggested that conduit diversion could have been more beneficial (1 patient failed with initial ileal conduit) [12]. In the summary by the NIH, an automatic exclusion for IC is patient age younger than 18 [1]. In the editorial comments, Freiha added "in carefully selected patients, namely elderly women with a fibrotic, contracted bladder and severe frequency, cystectomy with total urethrectomy is a successful treatment". In their review they also stated that urodynamic studies, electromyography, neuromodulation and histological diagnosis should be considered before any major operation [12].

Lotenfoe et. al. suggested a novel approach to proper patient selection for cystectomy and urethrectomy for the 20 women in the study. They presented better results when their patients after failing more conservative means and being worked up with various studies (cystoscopy with hydrodistention, capacity under anesthesia, bladder biopsy, and urodynamics) by determining if their pain is somatic by epidural studies, ruling out extrapelvic urological disease by a gynecologist, and possible treatment of a psychopathological disease before undergoing aggressive surgical management. Patients were only eligible for cystectomy if their pain decreased by 20% or more after undergoing epidural studies which suggested a somatic cause of their pain which could be amended by removing the respected urological organs and considering not allowing them to be surgical candidates if they demonstrated clinical signs of psychogenic or centralized sources of pain by a trained psychologist [27]. This is also favored by van Ophoven et al. as stating that a predictor for those patients that failed ileocecal augmentation would be in pain localization as a patient reported persistent pain in the urethra as this might have been avoided if the patient underwent urethrectomy as an original procedure [32]. 4 out of the 7 patients that had persistent symptoms after the surgery would not have been selected for surgery if they underwent the aforementioned tests. All 5 patients evaluated with pain localization techniques and screened for

psychological disease has successful outcomes as compared to 64% of 11 patients only clinically screened. They also added that best results were obtained in those with capacities under anesthesia of less than <400cc where 14 of 17 patients were cured and 1 of 5 patients failed with capacities >400. Interestingly, they noted that patients under the age of 40 (4/8 successful) had less favorable outcomes than patients that were older (12/14) [27]. This could in part help explain why in the article by Baskin and Tanagho where all patients were either 38 years old or younger had poor outcomes.

Furthermore, if even a small portion of the detrusor remains after surgery, any active interstitial cystitis within the bladder remnant will continue to cause pain [20]. In a review by Elzawahri et. al. 11/11 (average age of 45) patients who were originally treated with either enterocystoplasty or continent urinary diversion (where only three had ulcer presentation on cystoscopy) with or without cystourethrectomy where converted to ileal conduit and all but one had continued to have pelvic pain but not in the conduit [29].

In this paper, we present a series of patients that continued to experience interstitial cystitis symptoms after their urinary diversion procedures. We suggest a more radical procedure for these types of patients, involving urethrectomy and possibly anterior vaginectomy at the time of their initial cystectomy. Although it has been suggested that in some patients with interstitial cystitis, pain may persist even after total cystourethrectomy and urinary diversion, we believe this needs further explanation as Christmas et al observed optimistic findings in 14 patients undergoing total cystectomy and urinary diversion for interstitial cystitis and that "persistent pain after cystectomy suggests that the diagnosis of IC was erroneous" [21, 22].

CONCLUSION

Interstitial cystitis is a chronic and debilitating disease that is challenging to treat. Several therapies have shown promise, but there is a need for additional options for patients who are resistant to conservative measures. The patients we present had been treated with a variety of therapies including a trial of medical treatment, neuromodulation, and surgical procedures. Neither patient underwent urethrectomy or partial vaginectomy as a part of their surgical treatment. In both cases, the pain remained intractable. We suggest exploring a more radical surgical procedure involving cystectomy, urethrectomy, and anterior vaginectomy in hopes of accomplishing definitive treatment for these

refractory patients after an appropriate diagnosis of IC can be made, bladder capacity measured, and determinations if the source of pain is somatic or psychogenic in origin. This is an area worthy of further study including further classifying those with severe (classic) IC to determine the aggressiveness of reconstructive surgery as many of the past publications are incongruent with failure/success with their treatment of choices for their predetermined qualifications.

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