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Original Research Article

Outcomes of Cystodistension for Bladder Pain Syndrome: A Monocentric Analysis

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Abstract

Introduction*:** Bladder pain syndrome (BPS) is a chronic condition characterized by pelvic pain and urinary urgency/frequency. While the exact cause of BPS is unknown, various treatment options exist. This study aimed to evaluate bladder hydrodistension's short- and long-term efficacy in BPS patients. ***Methods: A retrospective analysis of four female BPS patients treated with bladder hydrodistension over 10 years was conducted. Symptoms, cystoscopy findings, and treatment outcomes were reviewed. ***Results*:** The average patient age was 40 years. All patients reported pain, with an average of 13 daytime and 3 nighttime urinary voids per day. Hydrodistension improved symptoms in 75% of patients, reducing daytime frequency and nocturia. Cystoscopy after hydrodistension revealed Hunner's ulcers in one patient and petechiae in three. One patient required a second hydrodistension. Transient worsening of symptoms and hematuria occurred in one patient each. ***Discussion*:** Bladder hydrodistension appears to be a safe and effective treatment for BPS, improving symptoms in most patients in our study. The findings are consistent with previous reports suggesting. Our study adds to the growing body of evidence supporting hydrodistension as a valuable tool in managing BPS. ***Conclusion*:** Bladder hydrodistension is a simple and minimally invasive technique that has proven its efficacy with a low complication rate. Our findings support the existing literature on the benefits of hydrodistension for BPS.

Keywords: Bladder pain syndrome, interstitial cystitis, hydrodistension, pelvic pain, Urinary Urgency.

INTRODUCTION

Interstitial cystitis/bladder pain syndrome (IC/BPS), formerly called interstitial cystitis, is a chronic (>6 weeks duration) pelvic condition that affects or appears to affect the urinary bladder with symptoms of discomfort, pressure, or pain. The condition is characterized by chronic inflammation and lower urinary tract symptoms, not due to infection or any other clearly identifiable cause. It is a diagnosis of exclusion [1].

Because the pathophysiology of Bladder Pain Syndrome (BPS) is not fully understood, treatments are often empirical. Currently, the most common approaches include conservative treatments such as bladder hydrodistension, bladder instillations, and systemic therapies. For severe cases of the disease that are resistant to treatment, surgery is a definitive treatment option.

The objective of our work is to review the contribution of hydrodistension in the treatment of BPS and its short- and long-term efficacy.

METHODS

This is a retrospective study conducted in our department, over a period of 10 years. This study includes 4 patients suffering from Bladder Pain Syndrome and treated by bladder hydrodistension.

RESULTS

The characteristics of the patients are detailed in Table 1.

Table 1: The Patient's Characteristics

Patient	1	2	3	4
AGE	31 years old	40 years old	57 years old	32 years old
SYMPTOMS	Chronic pelvic pain + Pollakiruia+Nocturia	Chronic pelvic pain+Nocturia	Chronic pelvic pain+Pollakiuria+ Nocturia	Chronic pelvic pain+ Pollakiuria
MEDICAL BACKGROUND	N/A	Urolithiasis	Diabetes	N/A
CYSTOSCOPY	Glomerations grade 3	Glomerations grade 3	Hunner's lesion	Glomerations grade 3
HISTOLOGY	inflammatory mast cell infiltration	non-specific inflammatory infiltration	inflammatory mast cell infiltration	non-specific inflammatory infiltration
COMPLICATIONS	Hematuria	NA	NA	NA
EVOLUTION	improvement of symptoms during 7 months	improvement of symptoms during 3 months	improvement of symptoms during 8 months	persistence of symptoms

The mean patient age was 40 years (range 31–57 years). All patients were women. Personal medical histories included diabetes in one patient and urolithiasis in another. The main presenting symptoms were:

Pain was present in all patients (100%), as pelvic pain, discomfort, or pressure.

Diurnal pollakiuria was the second most common symptom, with an average of 13 mictions per day.

Nocturia, with an average of three nocturnal awakenings.

Hydrodistension was performed after the failure of medical treatment. The maximum bladder filling capacity during hydrodistension was an average of 550 ml (range 250–800 ml).

Cystoscopy after hydrodistension revealed diffuse petechiae (grade 3) in 3 patients (Figure 1) and Hunner's lesion in one patient (Figure 2).

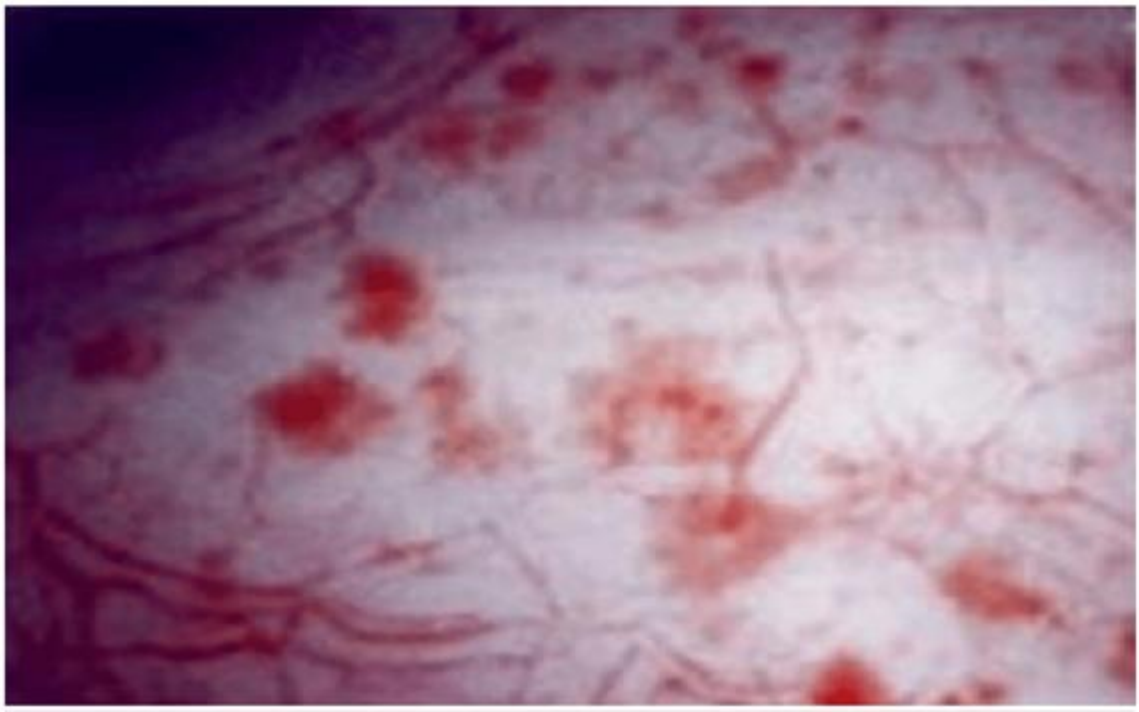

Figure 1: Giomerulations

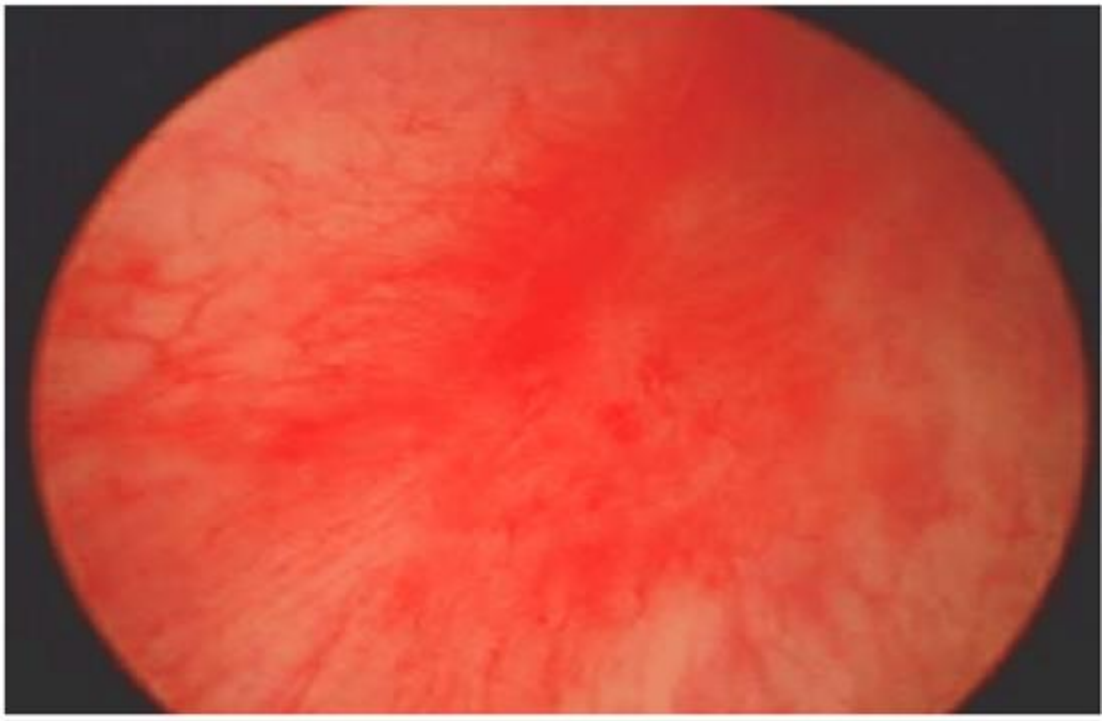

Figure 2: Hunner's lesion

Histopathological results of bladder biopsy showed an inflammatory mast cell infiltration of the bladder wall in 2 patients and a non-specific inflammatory infiltration in 2 patients.

There was a marked improvement in symptoms after hydrodistension in 3 of our patients. The success rate of hydrodistension treatment was therefore 75%. Diurnal pollakiuria decreased from 13 mictions before hydrodistension to 6 mictions after the procedure. Nocturia decreased from 3 awakenings to 1.5 awakenings per night. Moderate hematuria was observed during hydrodistension in one patient. The mean duration of symptom improvement was 6 months.

DISCUSSION

Interstitial cystitis is a rare disease. However, its prevalence is increasing in developed countries.

Despite its sex ratio of 10F/1H, this condition should not be overlooked in men, as it can mimic chronic prostatitis. The average age of patients is 45 years, which is also the case in our patients. However, according to Close *et al*., [2], the symptoms of interstitial cystitis can manifest in childhood. Some associations with inflammatory or autoimmune diseases, fibromyalgia, and panic disorders have also been reported in the literature [3]. The reason for consultation includes pollakiuria, nocturia, and especially pelvic pain.

Bladder hydrodistension is an integral part of the diagnostic workup for bladder pain syndrome but also has a therapeutic effect. Dunn *et al*., [4] reported that overdistension of the bladder for a long period at a pressure equivalent to systolic pressure causes hypoxia and metabolic acidosis of the bladder wall in rabbits and damage to nerve endings, leading to a decrease in bladder pain or an increase in bladder capacity.

Bladder hydrodistension is performed under general or regional anesthesia and begins with cystoscopy using a glycine solution to allow coagulation after biopsies. The perfusion height should be 80 cm above the pubic symphysis. The bladder is filled until the perfusion stops flowing, then the distension is maintained for 3 minutes at its maximum capacity, and then begins to empty. During filling and after emptying, a cystoscopic examination is performed to look for petechiae/glomerulations or Hunner's ulcers. Then, a second filling is performed. During the second filling, the maximum capacity is not reached to optimize the visualization of lesions and to perform biopsies [5].

Positive signs of BPS in cystoscopy are glomerulations grade 2-3 or Hunner's lesions (or both). Positive signs in biopsy findings are inflammatory infiltrates and/or granulation tissue and/or detrusor mastocytosis and/or intrafascicular fibrosis [6].

There is no specific duration or volume of distension

The volume depends on the bladder capacity and blood pressure of each patient. As for the duration, there are short hydrodistensions of a few minutes, and it seems that prolonged distensions over several hours are more effective in the long term on clinical symptomatology.

In our series, bladder hydrodistension was performed under epidural anesthesia and lasted an average of 20 minutes, up to maximum bladder capacity, in accordance with Taub and Stein [7]. This technique has shown symptomatic improvement in 54% to 90% of cases, for a variable duration, not exceeding 6 to 9 months.

The first series to report results of hydrodistension is that of BUMPUS in 1930 [8]. He noted an improvement in symptoms in 100 patients for several months. GLEMAIN et al conducted a study on 65 patients who underwent prolonged hydrodistension, including a first series of 33 cases analyzed retrospectively and a second series of 32 cases analyzed prospectively. The efficacy of bladder hydrodistension in this study, evaluated at six months and then at one year, was 37.5% and then 21.9% in the first series and 60.0% and then 43.3% in the second series [9].

The efficacy of hydrodistension and the improvement of pain and urinary symptoms in our study was satisfactory in 3 out of 4 patients. A second hydrodistension was performed in one patient. The combination of hydrodistension with other intravesical treatment for bladder pain syndrome has been described in the literature. Liu and Kuo [10] showed in a study of 19 patients the interest of performing a first hydrodistension followed 15 days later by injection of 100 or 200 U of botulinum toxin. With three months of follow-up, 14 patients were improved by this treatment.

Bladder hydrodistension complications are rare in the literature. Bladder rupture is a very rare complication that occurs, classically on small-capacity bladders and during prolonged hydrodistension, especially if it has been preceded by bladder biopsies [11]. In the extreme, a serious but fortunately very rare complication is bladder necrosis, which has been reported by Grossklaus and Franke [12] and by Zabihi *et al*., [13]. In our study, moderate hematuria was observed in one patient and responded well to only continuous bladder irrigation with saline.

LIMITATIONS

The present study is limited by its retrospective design and the inclusion of a relatively small sample size (n=4).

Our study's limited patient sample size can be attributed to several factors:

- The Rarity of Bladder Pain Syndrome (BPS): As BPS is a relatively uncommon condition, encountering a larger number of patients within a 10-year timeframe, especially at a single center, can be challenging.
- Monocentric Design: The study being conducted at a single institution may limit the generalizability of the findings to a broader population.
- Specific Treatment Focus: We excluded those treated with other modalities by focusing solely on patients who received hydrodistension for BPS. This may have narrowed the pool of eligible participants for the study.

CONCLUSION

Bladder hydrodistension is an integral part of the diagnostic workup for bladder pain syndrome, but it also has a therapeutic effect. It is a simple and minimally invasive technique that has proven its efficacy with a low complication rate. Although the number of patients is small, our findings support the existing literature on the benefits of hydrodistension for BPS.

Conflict of Interest: The authors declare no conflict of interest.

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