

Chapter 24

Hydrodistention, Transurethral Resection and Other Ablative Techniques in the Treatment of Bladder Pain Syndrome

Magnus Fall, Jørgen Nordling, and Ralph Peeker

Hydrodistension

Bumpus [1] was the first one to describe hydrodistension as a therapy for interstitial cystitis. He found in patients subjected to distension of the bladder under anaesthesia that there was a considerable, although temporary, relief of pain. Subsequently, the method was established as a standard therapeutic measure. As late as 40 years ago hydrodistension was a standard procedure, little else to be offered to patients with intolerable bladder pain. As is not uncommon, the scientific foundation of this method in the treatment of bladder pain syndrome (BPS)/interstitial cystitis is still not more than empirical. Explanations of the effect are speculative, the most favoured hypotheses ranging from disruption of the intramural sensory neural network to decrease of the blood supply to the detrusor.

When used as a therapeutic measure, distension during general anaesthesia has to be administered at regular intervals. The common interval between treatments used to be 3 months, providing temporary relief of pain although mostly short-lived and seldom sustained to the next treatment. Compared to ablation of lesions by transurethral resection, hydrodistension is inferior [2]. In exceptional cases, hydrodistension may be adequate to maintain pain relief for half a year or more, and in such cases it may be a realistic option although such cases are extremely rare.

M. Fall, M.D., Ph.D. (✉)

Department of Urology, Institute of Clinical Sciences, Sahlgrens University Hospital,
Bruna straket 11B, Gothenburg 41345, Sweden
e-mail: magnus.fall@urology.gu.se

J. Nordling, M.D., Dr. Med. Sci., F.E.B.U.

Department of Urology, University of Copenhagen, Herlev Hospital, Herlev, Denmark

R. Peeker

Department of Urology, Sahlgrenska University Hospital,
Bruna Straket 11, Gothenburg 41345, Sweden

Prolonged Distension

In 1972, Helmstein presented a method to treat superficial tumours of the urinary bladder [3]. He used a catheter furnished with a large balloon, transurethraly inserted into the bladder and expanded with fluid until an intravesical pressure above the arterial pressure was reached. The objective of this treatment was to reach a manifest pressure reducing the blood flow to the bladder and maintaining this pressure during periods of 30 min. Since the procedure is very painful, treatment had to be administered during regional or general anaesthesia. This modality was tested in severe urgency and also tried in interstitial cystitis. Dunn et al. [4] found this method useful but longer follow-up has been unfavourable and because of the complicated procedure the method has almost been abandoned.

Ablative Techniques

Transurethral Resection and Coagulation

The idea of resecting inflamed bladder tissue in BPS is not new; rather it dates back some one hundred years when Guy Hunner reported on open resection of ulcers [5]. Later, when transurethral techniques became available, transurethral resection and fulguration were on trial in limited investigations, also resulting in favourable but variable symptomatic outcome [6, 7]. In the 1980s, a more systematic application of the transurethral technique, with careful and radical electro-resection of all lesions, was described [2]. This technique yielded quite favourable results, also long-term, and implies complete resection of all lesions, including a peripheral oedema zone and the underlying superficial detrusor muscle, using a minimum of coagulation. Thus, broad coagulation of the resected surfaces is avoided, using solely pinpoint treatment of bleeding vessels. The reason for this mode of procedure is to avoid promotion or enhancement of bladder contracture, a well-known complication to the classic Hunner type, ESSIC BPS type 3C disease. Some 10 years ago the hitherto largest series on this technique was published. In this study, the long-term outcome in 103 patients with classic IC and their response to complete TUR of visible lesions were retrospectively evaluated [8]. In that series, an initial satisfactory symptomatic effect in nine of ten patients with BPS type 3C was registered. Interestingly, the included patients could be divided into four relatively distinct groups: long-term good responders (long-term remission for 3 years or more with a maximum of three resections), short-term good responders (need for repeated resections to stay symptomatically relieved and follow up less than 3 years), patients with bladder contracture (developed over more than 2 years) and end-stage disease (within 2 years after diagnosis). The excellent symptomatic effect in many patients with ESSIC 3C disease makes TURB a first-line treatment, with few comparable alternatives.

TUR has been suggested to result in symptom improvement by removal of intramural nerve endings engaged by the inflammatory process. Surgical complications are most commonly retroperitoneal bladder perforation and persistent hematuria. Such complications are rare and typically just require prolonged catheter drainage [8].

Laser

Neodymium (Nd): YAG laser has been used in urology since the 1960s. Shanberg et al. were the first to use it for treatment of BPS [9]. Laser ablation penetrates approximately 5 mm, heating tissue to 60–70 degree C, thought to be leaving elastic fibres undamaged. Laser is among some considered advantageous over TURB, since repeated resections are supposed to cause bladder contracture. The opposite argument can be inflicted on laser, since the depth of the laser effect is difficult to determine, bladder perforation occurring also with laser. Careful performance of TURB allows a reasonably good control of the extent of surgical damage. Which one of the two techniques might induce less reparative activity in the bladder wall remains an open question.

Essentially, the transurethral methods are only applicable in ESSIC type 3C disease with circumscript inflammatory lesions. Diffuse widespread glomerulations are not accessible to endoscopic ablation; in fact they are not necessarily an expression of a disease confined to the urinary bladder. The disease mechanisms and the response to various treatments are so far speculative. Ablation implies removal of intramural sensory nerves and inflammatory aggregates having an effect on nerves engaged by the inflammatory process. Traditionally, mast cells have been thought to reflect intensity and grade of 3C disease. Therefore, it has been hypothesised that patients with a high mast cell density respond more favourably to TUR-B; however a recent report could not demonstrate that the mast cell density in the lamina propria predicted outcome after TUR [10]. Hypotheses do not always turn out positive and many enigmas in BPS remain to be solved.

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