



BLADDER NECK STENOSIS SURGERY IN INTERSTITIAL CYSTITIS / BLADDER PAIN SYNDROME TREATMENT

© V.L. Medvedev^{1, 2, 3}, I.V. Mihailov^{1, 2}, S.N. Lepetunov^{1, 2, 3}, Yu.N. Medoev^{2, 3}, M.I. Kogan³

¹Kuban State Medical University, Krasnodar, Russia;

²Regional Clinical Hospital No. 1 named after prof. S.V. Ochapovsky, Krasnodar, Russia

³Rostov State Medical University, Rostov-on-Don, Russia;

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Introduction. Current methods of interstitial cystitis / bladder pain syndrome (IC/BPS) treatment don't allow to achieve long-term clinical remission. **Aim of the study** was to investigate the clinical efficacy of bladder neck transurethral incision (TUI) in women with IC/BPS, who had bladder outlet obstruction signs. **Materials and methods.** TUI was performed to patients with IC/BPS and proven bladder neck stenosis ($n = 29$). Assessment of the results of this operation was provided after 1, 3 and 6 months after surgical treatment. Treatment efficacy was evaluated by using Global Response Assessment (GRA) Scale, Pelvic Pain and Urgency / Frequency (PUF) Patient Symptom Scale, urination diaries, analysis of which allowed to determine functional bladder capacity, urinary frequency and nocturia. Pain assessment was made with 10-point Visual Analogue Pain Scale (VAS). Functional efficacy was evaluated with urodynamic examination, which included cystometric bladder capacity, maximal urinary flow rate and residual volume rate. Treatment results were compared with such in 39 patients with IC/BPS without signs of bladder neck stenosis. **Results.** GRA score ≥ 2 had 96.5% and 72.4% in 1 and 3 months after bladder neck TUI, respectively. VAS, PUF Scale parameters, cystometric bladder capacity, maximal urinary flow rate, residual volume rate, urinary frequency and nocturia values also significantly improved after surgery. **Conclusions.** This prospective clinical study is the first, in which IC/BPS course in women with bladder neck stenosis was investigated. It was noticed, that in 1 month after bladder TUI in 96.5% of patients decreased severity of IC/BPS symptoms, there were no urinary tract infection and local complications. In addition, this effect lasted for 3 months after surgery in 72.4% of patients and for 6 months in 68.9% of patients.

Keywords: interstitial cystitis / bladder pain syndrome; bladder neck obstruction; transurethral incision of the bladder neck.

ИНТЕРСТИЦИАЛЬНОГО ЦИСТИТА / МОЧЕПУЗЫРНОГО БОЛЕВОГО СИНДРОМА

© В.Л. Медведев^{1, 2, 3}, И.В. Михайлов^{1, 2}, С.Н. Лепетунов^{1, 2, 3}, Ю.Н. Медоев^{2, 3}, М.И. Коган³

¹Федеральное государственное бюджетное образовательное учреждение высшего образования «Кубанский государственный медицинский университет» Министерства здравоохранения Российской Федерации, Краснодар;

²Государственное бюджетное учреждение здравоохранения «Научно-исследовательский институт — Краевая клиническая больница № 1 им. профессора С.В. Очаповского» Министерства здравоохранения Краснодарского края, Краснодар;

³Федеральное государственное бюджетное образовательное учреждение высшего образования «Ростовский государственный медицинский университет» Министерства здравоохранения Российской Федерации, Ростов-на-Дону

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Введение. Современные методы лечения интерстициального цистита / мочепузырного болевого синдрома (ИЦ/МБС) не позволяют достичь длительной клинической ремиссии. **Цель исследования.** Изучить клиническую эффективность трансуретральной инцизии (ТУИ) шейки мочевого пузыря у женщин с ИЦ/МБС, имевших

признаки инфравезикальной обструкции. **Материалы и методы.** Пациентам с ИЦ/МБС и доказанным стенозом шейки мочевого пузыря ($n = 29$) выполняли ТУИ шейки мочевого пузыря. Оценку результатов данной операции проводили через 1, 3 и 6 мес. после хирургического лечения. Эффективность лечения оценивали с помощью шкалы глобальной оценки ответа (Global Response Assessment, GRA), шкалы симптомов ИЦ/МБС (PUF scale), дневников мочеиспускания, анализ которых позволял определять функциональную емкость мочевого пузыря, частоту мочеиспусканий и ноктурию. Оценку боли проводили по 10-балльной визуально-аналоговой шкале боли (ВАШ). Функциональную эффективность определяли с помощью уродинамического исследования, включавшего цистометрическую емкость мочевого пузыря, максимальную скорость потока и объем остаточной мочи. Результаты лечения сравнивали с таковыми у 39 пациенток с ИЦ/МБС без признаков стеноза шейки мочевого пузыря. **Результаты.** Показатель GRA ≥ 2 был у 96,5 и 72,4 % через 1 и 3 мес. соответственно после ТУИ шейки мочевого пузыря. Показатели ВАШ, PUF Scale, значения цистометрической емкости мочевого пузыря, максимальной скорости мочеиспускания и объема остаточной мочи, частоты мочеиспускания и ноктурии также значительно улучшились после оперативного вмешательства. **Выводы.** Данное проспективное клиническое исследование является первым, в котором изучали течение ИЦ/МБС у женщин со стенозом шейки мочевого пузыря. Отмечено, что через 1 мес. после выполнения ТУИ шейки мочевого пузыря у 96,5 % больных снижалась выраженность симптомов ИЦ/МБС, отсутствовали инфекция мочевых путей и местные осложнения. При этом данный эффект сохранялся у 72,4 % больных в течение 3 мес. и у 68,9 % — в течение 6 мес. после оперативного лечения.

🔑 **Ключевые слова:** интерстициальный цистит / мочепузырный болевой синдром; стеноз шейки мочевого пузыря; трансуретральная инцизия шейки мочевого пузыря.

INTRODUCTION

Interstitial cystitis/bladder pain syndrome (IC/BPS) is a chronic condition characterized by bladder pain and frequent urination. Although this pathology has been studied for many years, none of the treatment methods can currently provide a completely acceptable result for patients [1]. Hydrodistension, intravesical injections of hyaluronic acid, chondroitin sulfate, botulinum toxin A, and oral medications such as amitriptyline, sodium pentosan polysulfate, cyclosporine A have a low and short-term efficacy [2–8] due to the absence of the pathogenic management of this disease.

Clinical experience in the diagnosis and treatment of IC/BPS reveals that the nature of its pain may be different; it is assumed that the pain is not only caused by the localization of the zones of Hunner lesions, but also by the anatomical and functional state of the bladder [9–12].

Therefore, *the aim of this study* was to investigate the clinical efficacy of bladder neck transurethral incision (TUI) in women with IC/BPS, who had bladder outlet obstruction signs.

MATERIALS AND METHODS

The study involved 68 women with a typical IC/BPS, who had Hunner lesions, detected by cystoscopy. The disease duration for these patients was at least 2 years. According to urine culture analysis, all patients had no clinically significant bacteriuria. The mean age was 60.1 ± 10.5 years. All patients underwent check-up and were included into the study ac-

ording to the NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases) criteria [13].

All the patients had received previous treatments, including lifestyle changes; bladder hydrodistension; non-steroidal anti-inflammatory drugs; tricyclic antidepressants; intravesical instillations of lidocaine, dimethyl sulfoxide, heparin; and transurethral coagulation of Hunner lesions.

Before treatment, all the participants were asked to keep a voiding diary in order to determine the functional bladder capacity, urinary frequency (urgency) and nocturia. Severity of IC/BPS symptoms was evaluated using a questionnaire “Pelvic Pain, Urgency, and Frequency Patient Symptom Scale” (PUF Scale). Pain was assessed with the 10-point Visual Analogue Pain Scale (VAS). A questionnaire survey was also conducted with the Global Response Assessment (GRA) Scale [14, 15]. Urodynamic evaluation and cystometry were performed, with assessment of the sensitivity, detrusor overactivity, and cystometric bladder capacity. Bladder neck obstruction was identified during cystoscopy, followed 2 weeks later by uroflowmetry and urodynamic studies.

After hydrodistension; which leads to an increase in the bladder capacity, 29 (42.6%) patients noticed an increase in pain during urination and a change in the location. During endoscopic examinations, these same 29 patients were diagnosed with bladder neck stenosis, which was also confirmed by urodynamic studies.

The patients with bladder neck stenosis ($n = 29$); the study group, underwent bladder neck TUI. The in-

cision of the bladder neck was performed at the 12 o'clock position using a hook-type electrode along a length of 5–7 mm through the mucosa, submucosa, and part of the muscular layer of the bladder. A resectoscope (22 Ch, Karl Storz, Germany) was used. Afterwards, repeated bladder hydrodistension was performed. The surgery was completed with bladder catheterization using a 14 Ch Foley catheter which was removed on postoperative day 2.

Patients without bladder neck stenosis ($n = 39$); the control group, underwent a standard therapy for IC/BPS including transurethral coagulation of Hunner lesions, bladder hydrodistension, tricyclic antidepressants, and intravesical instillations of lidocaine, dimethyl sulfoxide, and heparin. Control evaluations were performed 1, 3, and 6 months after treatment.

Wilcoxon rank sum test was used to evaluate the difference between two dependent groups (repeated measurements in the same group of patients). The level of significance was defined as $p < 0.05$.

RESULTS

In the bladder neck stenosis group a GRA ≥ 2 was found in 96.5%, 72.4%, and 68.9% of patients 1, 3, and 6 months after the bladder neck TUI, respectively. Thus, most of the women had a satisfactory outcome for 6 months after treatment.

In the bladder neck stenosis group, parameters of the PUF Scale and VAS, cystometric bladder capacity, maximal urinary flow rate, postvoid residual urine volume, urinary frequency per day, and nocturia values improved after surgery (Table 1). All the patients had no signs of bladder outlet obstruction or urinary tract infection. Of note, only one (3.5%) of the 29 patients experienced no clinical effect from the surgical treatment.

In the control group GRA ≥ 2 was found in 76.8% and 69.3% of patients 3 and 6 months after the standard therapy, respectively. There was an improvement in the symptoms of IC/BPS according to the PUF Scale and VAS, an increase in functional and cystometric bladder capacities, a decrease in urinary frequency per day, and nocturia values in these patients. However, the degree of clinical improvement in the control group was lower than that in the bladder neck stenosis group (Table 2).

Due to the unstable course of the disease and regular recurrences requiring repeated therapy, the follow-up period did not exceed 6 months.

Urodynamic parameters before TUI in the bladder neck stenosis group differed significantly from those in the control group. However, even after surgical treatment during the follow-up period of 6 months, the two groups did not differ significantly in terms of the urodynamic parameters.

Table 1 / Таблица 1

Dynamics of symptoms and functional urination parameters after bladder neck TUI in patients of the main group ($n = 29$)

Динамика симптомов и функциональных показателей мочеиспускания после трансуретральной инцизии шейки мочевого пузыря у пациенток основной группы ($n = 29$)

Parameter	Before treatment	1 month after treatment	3 months after treatment	6 months after treatment
PUF Scale, scores	24.6 \pm 6.0	15.8 \pm 6.1	15.9 \pm 6.1	14.1 \pm 6.1
VAS, scores	7.6 \pm 1.5	3.2 \pm 1.8	3.3 \pm 2.1	3.2 \pm 1.1
Cystometric bladder capacity, ml	178.2 \pm 51.6	338.5 \pm 133.6	351.8 \pm 149.1	343.6 \pm 108.6
Q_{\max} , ml/sec	10.6 \pm 7.8	23.0 \pm 10.2	21.7 \pm 10.4	21.2 \pm 9.8
Postvoid residual urine volume, ml	66.4 \pm 139	21.7 \pm 27.6	23.9 \pm 31.8	22.5 \pm 33.7
Urinary frequency per day	17.9 \pm 3.8	11.5 \pm 4.9	11.4 \pm 4.9	11.6 \pm 5.7
Nocturia	3.7 \pm 0.7	3.0 \pm 1.0	3.0 \pm 1.1	2.9 \pm 1.1
GRA scale, scores	0	2.0 \pm 1.1	2.0 \pm 1.0	1.8 \pm 1.0

Note. PUF Scale – Pelvic Pain, Urgency, and Frequency Patient Symptom Scale, VAS – 10-point Visual Analogue Pain Scale, Q_{\max} – maximum flow rate, GRA scale – Global Response Assessment scale.

Table 2 / Таблица 2

Dynamics of symptoms and functional urination parameters before and 3 and 6 months after treatment of patients of the main and comparison groups (n = 68)

Динамика симптомов и функциональных показателей мочеиспускания до и через 3 и 6 месяцев после лечения у пациенток основной группы и группы сравнения (n = 68)

Parameter	Study group (n = 29)			Control group (n = 39)		
	Before treatment	3 months after treatment	6 months after treatment	Before treatment	3 months after treatment	6 months after treatment
PUF Scale, scores	24.6 ± 6.0	15.9 ± 6.1*	14.1 ± 6.1*	27.4 ± 5.7	20.3 ± 8.0*	21.2 ± 8.1*
VAS, scores	7.6 ± 1.5	3.3 ± 2.1*	3.2 ± 1.1*	7.5 ± 2.2	4.0 ± 2.3	5.1 ± 2.3
Cystometric bladder capacity, ml	178.2 ± 51.6	351.8 ± 149.1*	343.6 ± 108.6*	201.7 ± 80.7	325.3 ± 144.5	319.0 ± 147.3
Q _{max} , ml/sec	10.6 ± 7.8	21.7 ± 10.2*	21.2 ± 9.8*	21.6 ± 5.3	23.9 ± 12.4	22.6 ± 11.5
Postvoid residual urine volume, ml	66.4 ± 139	23.9 ± 31.8*	22.5 ± 33.7*	22.4 ± 21	15.4 ± 17.2	15.7 ± 12.4
Urinary frequency per day	17.9 ± 3.8	11.4 ± 4.9	11.6 ± 5.7*	16.9 ± 4.5	12.7 ± 5.3	13.2 ± 4.7*
Nocturia	3.7 ± 0.7	3.0 ± 1.1*	2.9 ± 1.1*	3.6 ± 1.0	2.5 ± 1.4*	1.8 ± 0.9*

Note. PUF Scale – Pelvic Pain, Urgency, and Frequency Patient Symptom Scale, VAS – 10-point Visual Analogue Pain Scale, Q_{max} – maximum flow rate. * p < 0.05 comparing with parameters before treatment.

The study showed that 42.6% of women with IC/BPS had endoscopic and urodynamic features of the bladder neck stenosis. Of them, a clinical improvement after bladder neck TUI was registered in 28 (96.5%) one month after surgery, in 21 (72.4%) 3 months after surgery, and in 20 (68.9%) of the 29 operated patients 6 months after surgery. Accordingly, there were no urinary tract recurrences and no surgical complications. In this group of patients, pain intensity, urinary frequency, and urodynamic parameters improved significantly after the bladder neck TUI.

CONCLUSION

Additional examinations for signs of a bladder neck stenosis is important in patients with IC/BPS who failed from standard therapy because surgical correction may be an important step for treatment and may promote more long-lasting remission in these patients.

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Information about the authors:

Vladimir L. Medvedev — Doctor of Medical Science, Professor, Chairman of the Department of Urology, Kuban State Medical University, Krasnodar, Russia; Professor of the Department of Urology and Human Reproductive Health (with a Course in Pediatric Urology-Andrology), Rostov State Medical University, Rostov-on-Don, Russia; Deputy Chief Physician for Urology, Head of the Urological Center of Scientific Research Institute — Regional Clinical Hospital No. 1 named after prof. S.V. Ochapovsky, Krasnodar, Russia. E-mail: medvedev_vl@mail.ru.

Igor V. Mihailov — Doctor of Medical Sciences, Professor, Department of Urology, Kuban State Medical University, Krasnodar, Russia; Doctor of the Oncourology Department of Scientific Research Institute — Regional Clinical Hospital No. 1 named after prof. S.V. Ochapovsky, Krasnodar, Russia. E-mail: miv67@yandex.ru.

Sergey N. Lepetunov — Postgraduate, Department of Urology and Human Reproductive Health (with a Course in Pediatric Urology-Andrology), Rostov State Medical University, Rostov-on-Don, Russia; Assistant of the Department of Urology, Kuban State Medical University, Krasnodar, Russia; Urologist, Scientific Research Institute — Regional Clinical Hospital No. 1 named after prof. S.V. Ochapovsky, Krasnodar, Russia. E-mail: lepetunov@gmail.com.

Сведения об авторах:

Владимир Леонидович Медведев — д-р мед. наук, профессор, заведующий кафедрой урологии, ФГБОУ ВО КубГМУ Минздрава России, Краснодар; профессор кафедры урологии и репродуктивного здоровья человека (с курсом детской урологии-андрологии), ФГБОУ ВО РостГМУ Минздрава России, Ростов-на-Дону; заместитель главного врача по урологии, руководитель уронефрологического центра, ГБУЗ «НИИ — ККБ № 1 им. проф. С.В. Очаповского» Минздрава Краснодарского края, Краснодар. E-mail: medvedev_vl@mail.ru.

Игорь Валерьевич Михайлов — д-р мед. наук, профессор кафедры урологии, ФГБОУ ВО КубГМУ Минздрава России, Краснодар; врач отделения онкоурологии, ГБУЗ «НИИ — ККБ № 1 им. проф. С.В. Очаповского» Минздрава Краснодарского края, Краснодар. E-mail: miv67@yandex.ru.

Сергей Николаевич Лепетунов — аспирант кафедры урологии и репродуктивного здоровья человека (с курсом детской урологии-андрологии), ФГБОУ ВО РостГМУ Минздрава России, Ростов-на-Дону; ассистент кафедры урологии, ФГБОУ ВО КубГМУ Минздрава России, Краснодар; врач-уролог, ГБУЗ «НИИ — ККБ № 1 им. проф. С.В. Очаповского» Минздрава Краснодарского края, Краснодар. E-mail: lepetunov@gmail.com.

Information about the authors:

Yuriy N. Medoev — Postgraduate, Department of Urology and Human Reproductive Health (with a Course in Pediatric Urology-Andrology), Rostov State Medical University, Rostov-on-Don, Russia; Urologist, Scientific Research Institute – Regional Clinical Hospital No. 1 named after prof. S.V. Ochapovsky, Krasnodar, Russia. E-mail: dadoev@list.ru.

Mikhail I. Kogan — Doctor of Medical Science, Professor, Chairman of the Department of Urology and Human Reproductive Health (with a Course in Pediatric Urology-Andrology), Rostov State Medical University, Rostov-on-Don, Russia. E-mail: dept_kogan@mail.ru.

Сведения об авторах:

Юрий Николаевич Медоев — аспирант кафедры урологии и репродуктивного здоровья человека (с курсом детской урологии-андрологии), ФГБОУ ВО РостГМУ Минздрава России, Ростов-на-Дону; врач-уролог, ГБУЗ «НИИ — ККБ № 1 им. проф. С.В. Очаповского» Минздрава Краснодарского края, Краснодар. E-mail: dadoev@list.ru.

Михаил Иосифович Коган — д-р мед. наук, профессор, заведующий кафедрой урологии и репродуктивного здоровья человека (с курсом детской урологии-андрологии). ФГБОУ ВО РостГМУ Минздрава России, Ростов-на-Дону. E-mail: dept_kogan@mail.ru.