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Using Endoscopic Recalanalization of the Urethra in Men

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Abstract: The article summarizes the results of the analysis of data from the treatment of 53 patients who underwent endoscopic recanalization of the obliterated urethra, followed by electroresection of scar tissue. Conducted clinical studies have shown that relapses after the intervention, by the end of 1 year of observation, occur in 18.9% of patients.

Keywords: urethral obliteration, endoscopic treatment, efficacy, stricture recurrence.

Relevance. Obliteration of the urethra is a severe urological pathology that has an extremely negative impact on the quality of life of the patient, dooming him to long-term, and sometimes life-long wearing of cystostomy drainage [9]. The problem of treatment of urethral obliteration remains one of the most difficult in urology, as evidenced by the high percentage of complications and relapses that require multiple reoperations. The complexity of the treatment of obliterations, unlike urethral strictures, lies in the complete absence of the urethral lumen with its replacement with dense scar tissue [1,10,11].

With cicatricial narrowing of the urethra, the range of choice of treatment method is quite wide. The absence of a lumen of the urethra and a pronounced cicatricial process significantly limits the range of therapeutic agents. According to a number of authors, the main method in the treatment of obliterations should be surgical [7, 8].

Unlike studies covering the results of endoscopic interventions for urethral stricture, only a few works are devoted to the evaluation of endoscopic operations aimed at correcting cicatricial obliterations of the urethra [2, 3, 4].

In this regard, the development of a new method of endoscopic urethral recanalization during its obliteration is of particular interest.

The purpose of the study. To improve the results of treatment of patients with cicatricial obliteration of the urethra.

Material and Methods. The basis of the work was the analysis of the results of treatment of 53 patients with urethral obliteration, who underwent a comprehensive examination, endoscopic treatment and further observation at the clinic of the Republican Specialized Scientific and Practical Medical Center of Urology. The age of the patients ranged from 13 to 80 years (average 46.4±19.8 years). When contacting the clinic, all patients had suprapubic cystostomy drainage, which was previously installed due to the impossibility of independent urination.

The inclusion criteria for the study were: the presence of cicatricial obliteration of the urethra and bladder neck; high operational risk due to comorbidities; unwillingness to risk sexual dysfunction; recurrence of cicatricial obliteration after unsuccessful reconstructive plastic surgery.

The exclusion criteria were: the presence of urethro-perineal urinary fistulas; pronounced deviation of the course and displacement of the ends of the urethra.

Clinical examination of patients included standard research methods used to diagnose stricture and obliteration of the urethra.

To restore the patency of the obliterated urethra, a new method of endoscopic treatment of urethral obliteration was used. (Patent for invention No. IAP 05389, priority dated June 24, 2014), which

consists in determining the location and length of urethral obliteration, creating a primary urethral canal under the control of polypositional X-ray telescoping and electroresection of scar tissue.

The effectiveness of endoscopic urethral recanalization was assessed by the maximum urine flow rate (Qmax) and the frequency of recurrence of urethral stricture at 1, 6, and 12 months of follow-up, depending on the location and extent of obliteration.

Results.

Analysis of the results of endoscopic urethral recanalization depending on localization obliteration showed that spontaneous urination was restored in all patients after surgery. In the initial periods of observation (end of 1 month), the volumetric flow rate of urine in patients with obliteration located in the area of the bladder neck averaged 17.2 ±0.6 ml/s. Subsequently, there was a slight decrease in Qmax, and by the end of the study it reached values of 16.1 ±0.5 ml/s; p >0.05 (Table 1).

Table 1. Qmax after surgery at different follow-up periods depending on the localization of obliteration (n = 53)

Obliteration localization	Qmax indicators (ml/sec)		
	1 month	6 months	12 months
Membrane part (n =6)	15.5 0.5 _±	1 3. 20.4 ±_ _	12. 1 ±0. 4
Bulbar part (n =8)	1 6. 4 ±. 6	1 3. 4 ±0.6 _	12. 6 ±0.5
Hanging department (n =8)	15.7 ±0.7	1 2. 3 ±0.6	1 1. 20.9 ±_ _
Neck m / bladder (n = 27)	1 7. 2± 0. 6	15.9 0.5 _±	1 6. 1 ±0.5 _
Two departments (n =4)	15.4 0.6 _ ±_	1 3. 5 ±0.7 _	10. 10.7 ±_ _

In patients with stricture located in the membranous, bulbar and hanging parts of the urethra, as well as in its two sections, the uroflowmetry index tended to decrease over the entire observation period. By the time the study was completed, the urination rate was statistically significantly lower than the initial numbers (p <0.05) (Table 1).

Stricture recurrence was more common in patients with obliteration located in two sections of the urethra; by the end of the study, stricture recurrence occurred in 50% of patients. In patients with obliteration located in the membranous, bulbar and hanging parts of the urethra, this indicator tended to increase, and by the end of the study was 33.3%, 37.5% and 25.0%, respectively (Table 2).

In patients with obliteration located in the region of the bladder neck, during the observation period, only 1 (3.7%) case had a relapse of the stricture (Table 2).

Thus, the Qmax index in patients with obliteration located in the area of the bladder neck was more significant, stable and long-term (until the end of 12 months of the study) than in patients with other localization of obliteration. At the same time, the frequency of stricture recurrence was significantly lower in patients with obliteration located in the region of the bladder neck.

Table 2. The frequency of relapses after surgery at different times of observation, depending on the localization of obliteration (n = 53)

Localization obliteration	Recurrence rate (n, %)			Total
	1 month	6 months	12 months	
Membrane part (n =6)	-	1 (16.7%)	1 (16.7%)	2 (33.3%)
Bulbar part (n =8)	1 (12.5%)	-	2 (25.0%)	3 (37.5%)
Hanging department (n =8)	-	1 (12.5%)	1 (12.5%)	2 (25.0%)
Neck m / bladder (n = 27)	-	-	1 (3.7%)	1 (3.7%)
Two departments (n =4)	1 (25.0%)	-	1 (25.0%)	2 (50.0%)
Total	2 (3.8%)	2 (3.8%)	6 (11.3%)	10 (18.9 %)

An analysis of the results of treatment depending on the extent of obliteration showed that the volumetric flow rate of urine in patients of the first group during the observation period did not show statistically significant differences. In the initial periods of observation (the end of 1 month), the volume flow rate of urine in these patients averaged 16.2 ±0.5 ml/s. By the end of the observation period (the end of 12 months), there was a slight decrease in Qmax (by 3.1%), to values of 15.7 ±0.7 ml/s; p >0.05 (Table 3).

Table 3. Qmax after surgery at different times of observation depending on the extent of obliteration (n = 53)

Groups	Obliteration length	Qmax indicators (ml/sec)		
		1 month	6 months	12 months
I group	up to 0.5 cm (n =8)	16. 20.5 ±_ _	16. 10.7 ±_ _	15.7 ±0.7
II group	0.6 to 1.0 cm (n =38)	15.3 0.5 _ ±_	13. 4 ±0.6	11.7 ±0.8
III group	more than 1.0 cm (n =7)	15.5 ±0.5	11.3 ±0.6	9.4 ±0.6

In patients of the second and third groups, the uroflowmetry index tended to decrease. By the end of the study, in the second group, Qmax worsened by an average of 23.5%, in the third group - by 39.4% (Table 3).

When comparing the results of treatment in terms of Qmax between groups, it was revealed that by the end of the study, a statistically significant increase in the volumetric flow rate of urine was observed in patients of the first group (p <0.05), compared with patients of the second and third groups.

Thus, a statistically significant improvement in urine flow was observed only in patients with urethral obliteration up to 0.5 cm, from 1 month to the end of the study.

An analysis of the frequency of relapses depending on the length of the obliteration showed that stricture recurrences were more often observed in patients of the third group; during the observation period, the number of relapses steadily increased, reaching 57.2% by the end of the study. In patients of the second group, this indicator also tended to increase over the observation period, and by the end of the study amounted to 13.2%. In patients of the first group, only by the end of the study, in 1 (3.7%) case, a relapse of stricture occurred (Table 4).

Table 4. The frequency of relapses after surgery at different periods of observation, depending on the length of obliteration (n = 53)

Groups	Obliteration length	Recurrence rate n (%)			Total
		1 month	6 months	12 months	
I group (n =8)	up to 0.5 cm	-	-	1 (12.5%)	1 (12.5%)
II group (n =38)	0.6 to 1.0 cm	1 (2.6%)	1 (2.6%)	3 (7.9%)	5 (13.2%)
III group (n =7)	more than 1.0 cm	1 (14.3%)	1 (14.3%)	2 (28.6%)	4 (57.2%)
Total		2 (3.8%)	2 (3.8%)	6 (11.3%)	10 (18.9 %)

When comparing the results of treatment in terms of the frequency of relapses between groups, it was found that by the end of the study, stricture relapses were statistically significantly more common in patients of the third group (p <0.05), compared with patients of the first and second groups.

Thus, it was determined that the average recurrence rate of urethral stricture after endoscopic urethral recanalization is 18.9%, and the treatment results depend on the extent of obliteration.

Discussion.

According to some authors, the unjustified widespread use of endoscopic techniques and ignoring the indications for open urethroplasty may lead to an increase in the incidence of extended anterior urethral strictures in the future [5].

However, in debilitated patients or in patients who refuse radical treatment, the use of endourethral procedures is possible as a palliative method of treatment. Despite the fact that the effectiveness of endourethral methods does not exceed 10-35%, most urologists are in no hurry to abandon their use. According to current recommendations, bougienage and internal optical urethrotomy can be used as the first line of treatment only in patients with short (less than 1 cm), single strictures of the bulbous urethra without severe spongiofibrosis [6].

Considering the paucity of works covering the results of endoscopic interventions in cicatricial obliteration of the urethra, we set out to develop a new method for endoscopic recanalization of the urethra in its obliteration. According to this method, the primary canal at the site of obliteration of the urethra is created using various dilating devices, focusing on the end of a metal bougie inserted into the posterior urethra through the suprapubic vesical fistulous canal, control is carried out using polyposition X-ray telescoping.

The implementation of this technique made it possible to carry out the intervention without the threat of damage to the rectum and urethra, with the formation of a false passage.

The average duration of the operation was 36.3±2.5 minutes. The need for drainage of the bladder after surgery averaged 23.1 ± 1.2 days (range 21-29 days). The average stay of a patient in a hospital (bed-days) was 6.1 ± 2.7 days (range 1-16 days).

Among the most serious intraoperative complications was bleeding, which was observed in 1 patient (1.9%). The cause of intraoperative bleeding was damage to the submucosal veins of the bladder neck during antegrade introduction of a metal bougie into the urethra. There was no need to compensate for the blood loss, the bleeding was stopped by installing a Foley catheter through the urethra and squeezing the bleeding vessel with a catheter balloon.

Among the postoperative complications, infectious and inflammatory complications were the most frequent - in 7 (13.2%) patients. Of these, 6 patients had urethritis, 1 had acute prostatitis. The cause of postoperative infectious and inflammatory complications in all cases was the presence of urinary tract infection before the main intervention.

During the observation period, the number of relapses steadily increased, reaching 18.9% by the end of the study. It was found that the results of treatment depend on the location and extent of obliteration.

Unfortunately, at present, we do not have data on the results of the study in longer follow-up periods. The work has its continuation. We hope that endoscopic urethral recanalization will find its rightful place among endoscopic interventions for cicatricial obliteration of the urethra.

Conclusion. Endoscopic urethral recanalization is an affordable and effective method in the treatment of patients with urethral obliteration. Relapses after this type of intervention, by the end of 1 year of observation, occur in 18.9% of patients.

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