

Research Article

Long-term Results of Optical Laser Urethrotomy for Post-traumatic Stricture of the Membranous Urethra

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Abstract

Urethral stricture is a common condition characterized by the narrowing of the urethra, leading to difficulty in urination. This article presents a case report of a 47-year-old male with urethral stricture following a pelvic fracture. The patient presented with urinary retention and a history of traumatic injury. Diagnostic imaging revealed a 2.0-2.2 cm stricture in the membranous urethra. Surgical intervention, including optical laser urethrotomy and silicone urethral catheter placement, was performed successfully. Postoperative management included antibacterial and anti-inflammatory therapy, leading to the restoration of independent urination. Urodynamic examination confirmed the successful outcome of the surgery. This case demonstrates that endoscopic surgery for urethral strictures can have a favorable prognosis. However, due to the potential for recurrence, ongoing outpatient care and monitoring by a urologist are essential for these patients.

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Received: October 17 2023

Accepted: November 19 2023

Published: March 14 2024

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Keywords: urethral stricture, pelvic fractures, urethrotomy, urethral catheterization, urologic surgical procedures

1. Introduction

Urethral stricture is a persistent narrowing of the urethra caused by the formation of scar tissue in the walls of the canal, making urination difficult. Chapple [1] considers it appropriate to use the following terminology: 1. Urethral stricture – in relation to the anterior urethra; 2. Urethral stenosis – in relation to the posterior urethra; and 3. Sphincter stenosis – in relation to short strictures of the membranous urethra.

Urethral stricture is a fairly common disease, occurring in the structure of diseases of the genitourinary system in about 0.6% of adult men [2]. According to etiology, strictures are most often divided into inflammatory, traumatic, postoperative, and idiopathic [3]. According to their length, strictures are divided into short (up to 1 cm), medium length (1.0-2.5 cm), and long (more than 2.5-10 cm). According to localization, strictures of

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the prostatic, prostate-membranous, membranous, bulbous, and hanging parts of the urethra are distinguished [4].

According to the clinical course, strictures are divided into primary and recurrent [5]. Based on the number of strictures, there are single and multiple strictures [5]. In relation to the external sphincter of the bladder, they are divided into strictures of the anterior and posterior urethra [6]. The clinical picture of urethral stricture, which significantly reduces the patient's quality of life, is manifested by symptoms of bladder outlet obstruction [2]. Damage to the urethra due to pelvic fracture can be associated with complications such as the formation of recurrent urethral stricture, urinary incontinence, and erectile dysfunction [7].

The incidence of urethral injury in men due to pelvic fracture varies widely. Two extensive literature reviews estimate the incidence of urethral trauma to be between 1.6% and 25% (mean 9.9%) [7]. In approximately 27% of cases, a fracture of the pelvic bones with damage to the urethra is combined with trauma to the abdominal organs [7].

At the time of injury, the urethra ruptures at the prostatic-membranous junction due to transverse impact, with further formation of a scar. The main methods of surgical treatment of urethral stricture include, 1. Bougienage of the urethra; 2. Internal optical urethrotomy; 3. Urethral stents; 4. Urethroplasty; 5. Bulboprostatic anastomosis for a urethral distraction defect after a fracture of the pelvic bones; 6. Perineostomy; and 7. Urine diversion [8].

2. Case Report

On September 10, 2023, a 47-year-old patient O was admitted to the urology department of the State Clinical Hospital at the PCV "MOB No. 2" with a diagnosis of urethral stricture. Upon admission, he complained of the inability to urinate independently and the presence of a cystostomy. From the anamnesis it was found that in March 2017 he had an open injury to the lower extremities along with a fracture of the pelvic bones after a fall from a height, for which he was hospitalized in the traumatology department.

In the postoperative period, after 2 months, he noticed difficulty urinating, episodes of acute urinary retention, for which he consulted a urologist on an outpatient basis. An attempt to install a urethral catheter on an outpatient basis was unsuccessful, after which the patient underwent trocar cystostomy.

The urology department carried out the necessary range of general clinical laboratory and instrumental examination methods. The results of a general urine test showed signs

of inflammation: leukocytes - 15 in the p/z; erythrocytes - 10 in p/zr; protein – 0.01 g/l; mucus in urine ++; bacteria in urine +++. For preoperative preparation, the patient was given a course of antibacterial and anti-inflammatory therapy.

According to the ultrasound examination, which included ultrasound of the kidneys (without pathology), ultrasound of the bladder, and TRUS of the prostate gland, signs of chronic cystitis and prostatitis were observed (prostate volume was 30 cm³). Based on the results of retrograde urethrography with antegrade cystography, the stricture length of the membranous urethra was determined to be 2.0 – 2.2 cm (Figures 1 and 2). On September 10, 2023, urethroscopy was performed where a stricture of the membranous urethra was revealed (Figure 3).

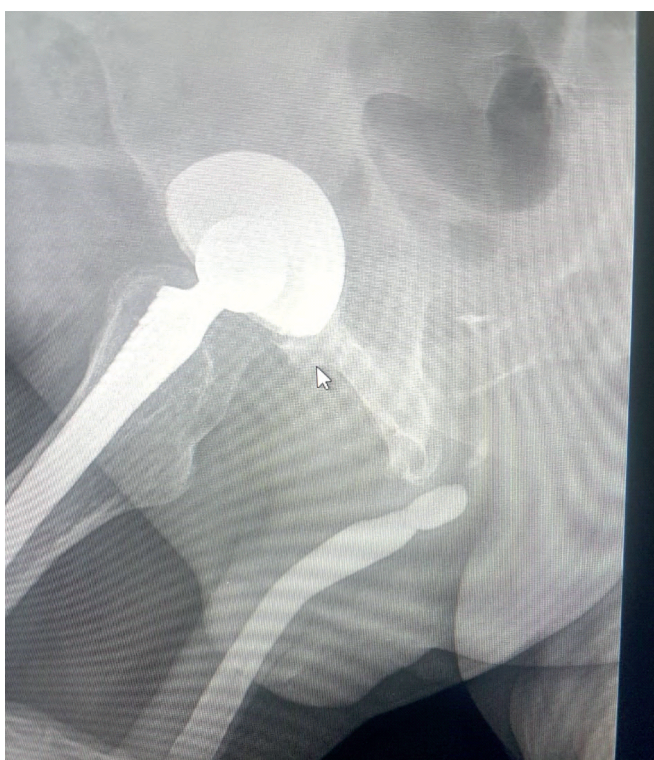


Figure 1: Retrograde urethrography of patient O.

Considering the presence of stricture of the membranous urethra and chronic urinary tract infection, preoperative sanitation of the urinary tract was performed followed by surgical treatment in the following volume, optical laser urethrotomy and installation of a silicone urethral catheter.

The progress of the operation, as of October 12, 2020, were observed in the operating room, under spinal anesthesia, after treating the surgical field three times with povidone, under vision control, and by inserting a 20CH urethroscope with 0-degree optics into the urethra. Upon examination, an insurmountable ring-shaped narrowing was determined

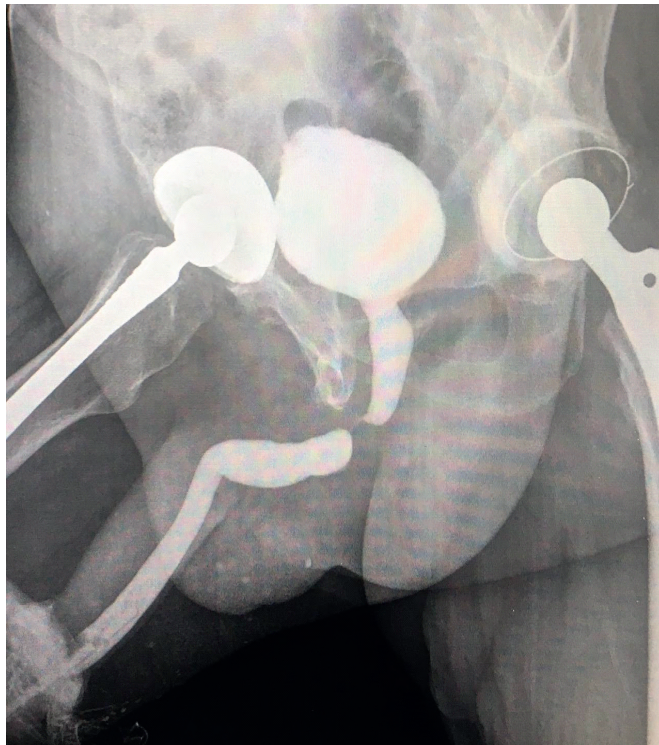


Figure 2: Retrograde urethrography + antegrade cystography of patient O.

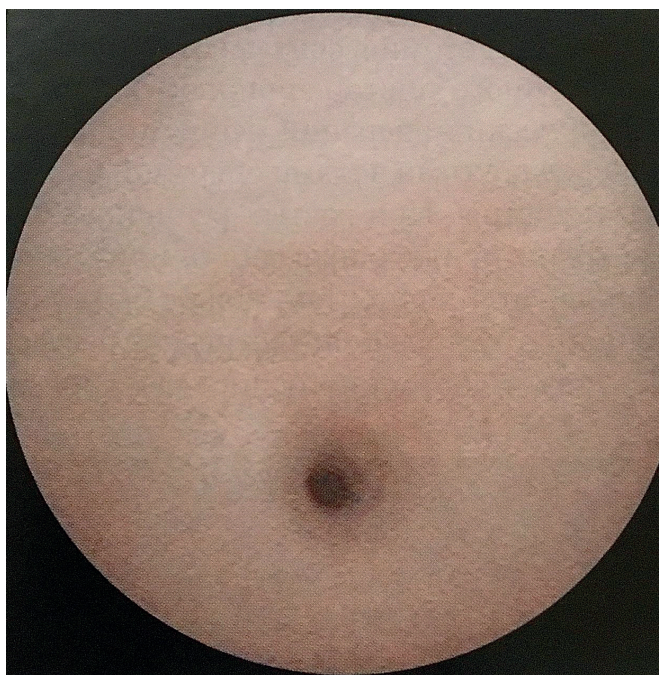


Figure 3: Urethroscopic picture.

in the membranous urethra, which was dissected using a Dornier holmium laser at 4, 8, 12 o'clock.

The scar-narrowed area of the urethra was excised to the borders with the unchanged mucosa and the scar tissue was vaporized. The urethroscope was removed, and a silicone urethral catheter No. 22CH was installed in the bladder.

The postoperative period was uneventful; the urethral catheter was removed after 3 months. In a hospital setting, instillation with hydrocortisone, physiotherapy with lidase, and a complex of anti-inflammatory therapy were carried out. A complete restoration of independent urination was confirmed by performing a urodynamic examination (Figure 4).

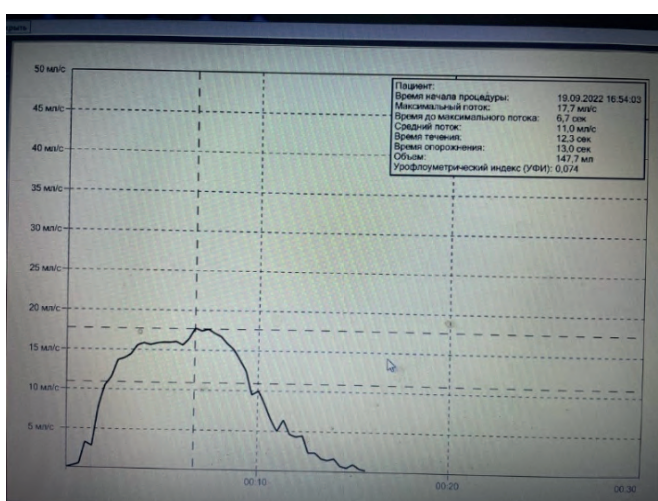


Figure 4: Result of uroflowmetry of patient O. 24 months after surgery.

3. Conclusion

This clinical case showed that with urethral strictures after endoscopic surgery, the prognosis is quite favorable. However, due to the likelihood of frequent relapses of urethral stricture, this category of patients should be observed by a urologist on an outpatient basis, with the need to perform comprehensive laboratory and urodynamic examinations.

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