

Diagnostic Application of Flexible Cystoscope in Pelvic Fracture Urethral Distraction Defects

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Introduction: The aim of this study was to evaluate the diagnostic value of antegrade flexible cystoscopy in pelvic fracture urethral distraction defects (PFUDD).

Materials and Methods: Between 1999 and 2004, a total of 111 patients with PFUDD were evaluated by antegrade flexible cystoscopy. The flexible cystoscope was introduced into the posterior urethra and the area was evaluated for any probable fistula, false passages, or displacement of the posterior urethra. For preventing misalignment, flexible cystoscopy was also used during the urethroplasty to open the posterior urethra at its exact distal point.

Results: Posterior urethra ended distal to the external sphincter in 16 patients (14.4%). Five (4.5%) and 9 (8.1%) patients had severe displacement of the posterior end of the urethra and bladder neck false passage, respectively. Prostatic urethrorectal fistula was detected in 1 patient. Another 1 patient had bladder rhabdomyoma.

Conclusion: Flexible cystoscopy is a valuable procedure in the evaluation of the bladder, the bladder neck, and the posterior urethra in patients with urethral distraction defects and complements voiding cystography before the surgery. It is also helpful for showing the exact distal point of the proximal urethra during urethroplasty in cases with displaced posterior urethra.

Keywords: urogenital trauma, urethral stricture, cystoscopy

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INTRODUCTION

Pelvic fracture urethral distraction defects (PFUDDs) accompany 10% of the pelvic fractures. The most frequent point of distraction is at the level of the junction of the membranous and bulbospongiosus parts of the urethra.^(1,2) Defining the precise anatomy of the distraction defect is important in repairing any subsequent stricture. Contrast studies are the first-choice methods for evaluation of the distraction defect. The conventional methods include simultaneous voiding cystourethrography (VCUG) and dynamic retrograde urethrography

(RUG). When the proximal urethra is not visualized, antegrade flexible cystoscopy is used for assessment of the bladder neck and the posterior urethra.^(1,2) However, the knowledge of flexible cystoscopy usage for routine evaluation of the urethral distractions are limited. We examined diagnostic flexible cystoscopy in the evaluation of the bladder, the bladder neck, and the posterior urethra in cases suspected of urethral distraction. During our 10-year experience of urethroplasty, we found many patients with PFUDD in whom the proximal urethra was displaced from its normal position due to the severity

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Figure 1. Urethral misalignment after urethroplasty.

of the trauma. Also, we observed some cases of misalignment of the posterior urethra in previously operated patients (Figure 1). Thus, we used flexible cystoscope as the guiding tool for finding the exact distal point of the proximal urethra during urethroplasty.

MATERIALS AND METHODS

We performed a retrospective study on patients with PFUDD and complete obliteration of the urethral ends in Shohada-e-Tajrish Hospital. These patients underwent diagnostic antegrade flexible cystoscopy under a light sedation after an average of 6 months following the trauma. All patients had indwelling suprapubic catheter. The diagnostic procedure was fully instructed to the patients and informed consent was obtained. We routinely performed simultaneous VCUG and RUG as well as antegrade flexible cystoscopy in all patients.

The flexible cystoscope was introduced through a mature suprapubic tract easily and often without any need for further dilatation or use of the Amplatz sheath. The bladder and the bladder neck were initially inspected for any possible calculus, tumor, or fistula. Then, the flexible cystoscope was introduced into the posterior urethra and the area was evaluated for any probable fistula, false passages, or deviation of the posterior urethra. We used the verumontanum as a landmark that determined the 6

o'clock position of the posterior urethra. Therefore, we were able to determine any displacement of the urethral ends to the right, left, up, or down. In cases with severe displacement toward rectum or the lower limit of the pubic bone, we repeated antegrade flexible cystoscopy toward the proximal urethral end during perineal dissection urethroplasty to make sure that the posterior urethra would be opened exactly at its end (Figures 2 and 3). In such cases, we perineally introduced a tiny needle at the proposed

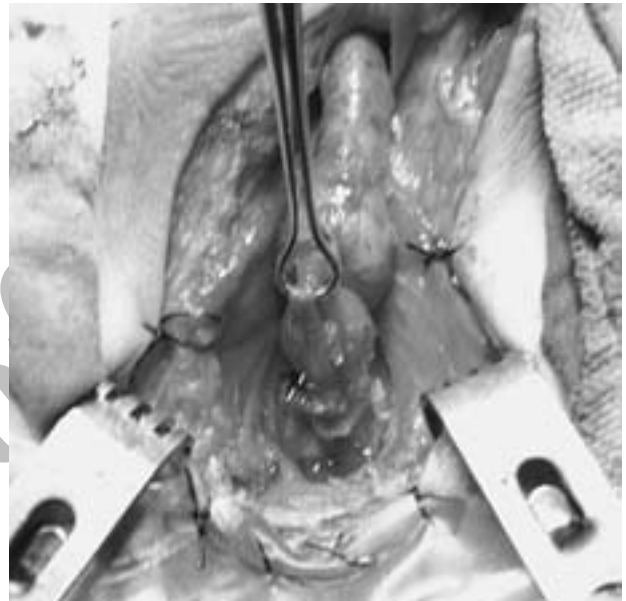


Figure 2. The bulbar and membranous parts of the urethra are dissected and the obliterated urethra is ready to be cut out of the fibrotic site.

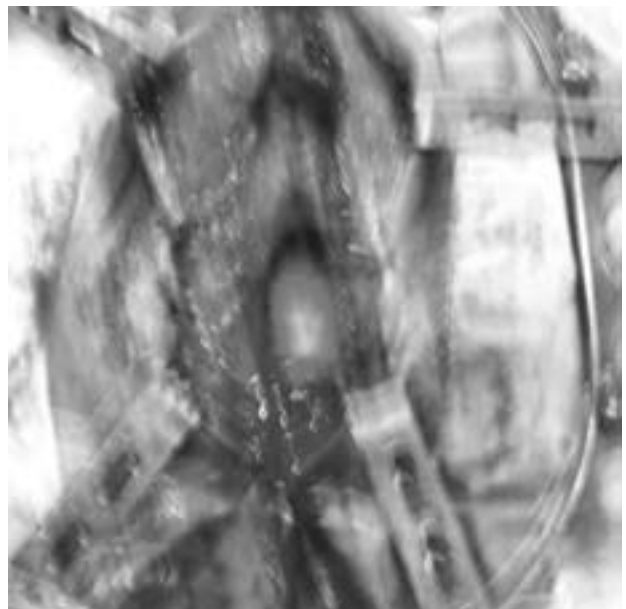


Figure 3. Flexible cystoscope light.

site of the proximal urethral opening and checked it endoscopically to make sure that it has entered the urethra exactly at its end. In some cases with severe displacement, we adjusted the site of the needle once or twice before opening the proximal urethra (Figures 4 and 5).



Figure 4. Needle insertion to the proximal urethral end with the help of flexible cystoscopy.

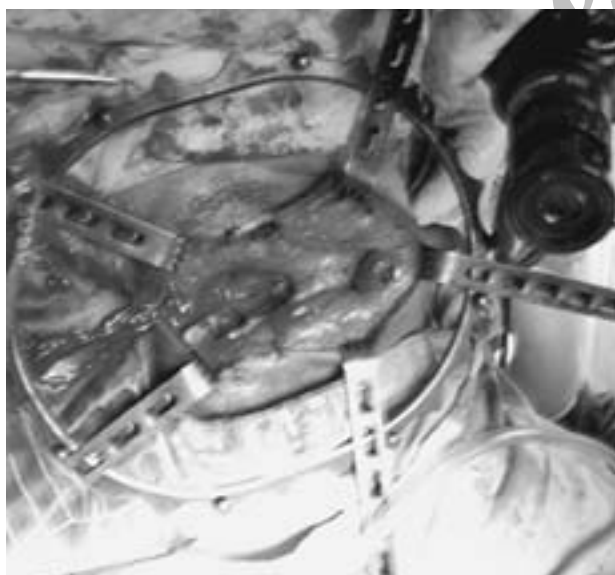


Figure 5. Adjustment of the needle to the proximal urethral end with the help of flexible cystoscopy.

RESULTS

A total of 111 patients underwent diagnostic flexible cystoscopy. The mean age of the patients was 32.1 years (range, 10 to 72 years). The posterior urethra ended distal to the external sphincter in 16

Cystoscopic Findings in Patients with Pelvic Fracture Urethral Distraction Defects

Cystoscopic Findings	Patients (%)
End of the proximal urethra	
Distal to external sphincter	16 (15.0)
Distal to verumontanum	95 (85.0)
Deviation of posterior urethral end	
Anterior	2 (1.8)
Posterior	1 (0.9)
Left	2 (1.8)
Right	0
Total	5 (4.5)
False passage	
Posterior urethra	6 (5.4)
Bladder neck	3 (2.7)

patients (14.4%). Five patients (4.5%) had severe displacement of the posterior urethral end toward the rectum or the lower limit of the pubic bone. Prostatic urethrorectal fistula, bladder rhabdomyoma (determined by biopsy), and bladder neck false passage were reported in 11 patients (9.9%). The standard VCUg did not show the abovementioned information except for urethrorectal fistula in 1 patient and bladder neck false passage in 3. Details of the cystoscopic findings are listed in the Table.

DISCUSSION

Evaluation of the PFUDD has traditionally been performed by VCUg and RUG. Magnetic resonance imaging (MRI) is a valuable technique for defining the length of prostatomembranous defect and distorted pelvic anatomy.⁽³⁻⁵⁾ However, the digital subtraction details of the urethra are not obtainable by MRI.⁽¹⁾ In addition, it is costly and unfamiliar to the urologist.⁽⁶⁾

Three-dimensional spiral computed tomography/cysto-urethrography (CTCUG) has been used for determining the location of the distraction and the length of the misalignment of the urethral ends.^(6,7) Although CTCUG does not require an experienced operator and is simpler than conventional radiology, it is relatively expensive and not available at all centers. Some investigators have proposed ultrasonography, which is especially useful in anterior urethral stricture disease.⁽³⁾

Antegrade flexible cystoscopy is suggested to assess the bladder neck and the posterior urethra in cases whose proximal urethra is not visualized on cystography.⁽¹⁾ Lewis and McCullough performed this diagnostic procedure on 2 patients in 1985.⁽²⁾

Kielb and colleagues reported their experience with initial flexible cystourethroscopic evaluation of the suspected urethral injury due to blunt trauma in 10 patients. They concluded that primary flexible cystourethroscopy with placement of a urethral catheter streamlines evaluation of the traumatic posterior urethral injury.⁽⁸⁾

We routinely performed VCUG, RUG, and diagnostic antegrade flexible cystoscopy in all patients with PFUDD who had complete separation of the urethral ends. This diagnostic procedure is easy-doing and adds only 4 to 5 minutes to the total operative time. It helps us have better understanding of the bladder and its pathologic disease before the operation. It completes standard voiding cystography in the diagnosis of bladder neck false passages which are mainly caused by previous manipulations and is also valuable in the evaluation of proximal urethral length and fistula especially when proximal urethra is not visualized on voiding cystography. It is also valuable in determination of the severe proximal deviation of the urethral end and helps us do an exact and under-vision opening of the posterior urethra in cases with severe displacement of the posterior urethral end.

CONCLUSION

Flexible cystoscopy is a valuable procedure for evaluating the bladder, the bladder neck, and the posterior urethra in cases of PFUDD and complements the results of VCUG before the surgery.

CONFLICT OF INTEREST

None declared.

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