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Original Article

Effect of Silodosin on bladder outlet during antegrade cystourethrogram in patients with pelvic fracture urethral distraction defect

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Abstract:

Background: *Pelvic fracture urethral distraction defect is a traumatic injury to the male urethra that affects the region between the bulbar urethra and the prostatic apex. Pelvic fracture causes urethral injury in about 10% of patients. Combined retrograde urethrogram and antegrade cystourethrogram is used to define the length of the urethral injury before planning the definitive surgery. But during antegrade cystourethrogram bladder outlet sometimes fails to open due to faulty technique, prolong suprapubic catheterization and increase sympathetic drive, leading to erroneous estimation of the length of urethral injury. To overcome this problem Silodosin used in this study, which is a highly uroselective and rapid-acting α-adrenoreceptor antagonist in comparison to other α-adrenoreceptor antagonists available in the market. The uroselectivity of Silodosin helps in maximizing the effect by opening the bladder outlet and limiting the adverse effect on the cardiovascular system.The objective of the study was to assess the effectiveness of Silodosin in opening bladder outlet in patients with pelvic fracture urethral distraction defect on antegrade cystourethrogram.*

Methods: *This is a Quasi-experimental study that was conducted in the Department of Urology, Bangabandhu Sheikh Mujib Medical University. In this study, 35 Patients with pelvic fracture urethral distraction defect with suprapubic catheter in situ who failed to open the bladder outlet on initial antegrade cystourethrogram were included. Urine culture and sensitivity report is confirmed negative. All participants were received a single dose of Silodosin capsule 3 hours before the antegrade cystourethrogram. Retrograde urethrogram was performed. After 3 hours bladder was filled with diluted contrast through the indwelling suprapubic catheter under sterile conditions according to bladder capacity. When the participants were felt the normal desire to void, bladder filling was stopped and voiding command was given and x-ray films were taken. Then the x-ray films were reviewed and findings were noted about the opening of the bladder outlet and visualization of the posterior urethra. Any complications during the procedure were observed and noted. After confirming hemodynamic stability, patients were advised to go home and continue the prescribed antibiotic for 5 days.*

Results: *Thirty-five men were evaluated during this study period. The mean ages of the patients were 39.9±10.4 years. All patients had a suprapubic catheter in situ and the mean duration of the suprapubic catheter was 3.8 ± 1.5 months. On average 363±87.3 ml of diluted contrast were introduced to initiate voiding reflex. Thirty-two patients out of the 35 patients (91.4%) were able to achieve the satisfactory opening of the bladder outlet (95% confidence interval 82.11-100%), while 3 patients (8.6%) failed to open the bladder outlet. No patient developed postural hypotension after single dose of Silodosin. Two patients were reported post procedure (combined retrograde urethrogram and antegrade cystourethrogram) fever, which needed another 5 days antibiotic treatment.*

Conclusion: *Single dose of Silodosin before antegrade cystourethrogram conferred a statistically significant increase in opening the bladder outlet inpelvic fracture urethral distraction defectpatients.*

Key words: *Silodosin, Urinary Bladder Outlet, Antegrade Cystourethrogram, Pelvic fracture urethral distraction defect.*

Introduction:

Posterior urethral disruption is a traumatic injury to the male urethra that affects the region between the bulbar urethra and the prostatic apex.[1,2] Pelvic fracture causes urethral injury in about 10% of the male patients.[3] High-velocity automobile accidents are common in developed countries. While in the developing world, injuries are caused by two-wheeler accidents, pedestrians, farming accidents, fall from height, fall from tractor, fall from tree, and other causes like earthquake.[4] Major forces of pelvic fractures are anteroposterior compression, lateral compression with or without rotation and vertical shear.[5] Membranous urethra is positioned between two relatively fixed points at prostate-membranous junction by puboprostatic ligament to the pelvis and at bulbo-membranous junction in the perineum just distal to urogenital diaphragm. Due to pelvic fracture, pubic ramus moves upwards resulting in shearing force that passes through the urethra, thus membranous urethra is distracted and causes upward migration of prostate with puboprostatic ligament.[6]

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Urethral disruption is diagnosed immediately after injury by the triad, presence of blood at the external urethral meatus, inability to urinate, and palpable full bladder.[7] The standard management approach in posterior urethral injuries is the establishment of urinary drainage by suprapubic catheterization and delayed posterior urethral reconstruction by anastomotic urethroplasty. Suprapubic cystostomy kept in situ for at least 3 months from the time of injury before performing urethroplasty, to allow the initial injury to heal, hematoma to resolve, and the extent of the injury clearly defined.[8]Before planning anastomotic urethroplasty, imaging studies are necessary to delineate the bladder neck and characteristics of urethral rupture defect, as this is a critical factor determining the success of surgical procedure.[9] A combined retrograde urethrogram (RGU) and antegrade cystourethrogram (ACUG) is the traditional primary mean of evaluation of injured posterior urethra because it can define the length of the injured urethra correctly if the bladder outlet opens.[10]

But 30-51.7% of the pelvic fracture urethral distraction defect (PFUDD) patients fails to open bladder outlet during retrograde urethrogram and antegrade cystourethrogram because of long-standing suprapubic catheter which reduces bladder capacity sufficient enough to tolerate bladder distension and open the bladder outlet voluntarily.[10,11] In addition, during antegrade cystourethrogram, few individuals remain anxious because of unnatural position and unfamiliar surroundings which can increased sympathetic drive, thus prevent the opening of the bladder outlet and incomplete evaluation of the distraction defect length leading to failure of the test.[12] To overcome this problem various other methods such as passing of curved metal sound, ultrasonography, antegrade urethroscopy, magnetic resonance imaging (MRI) and three-dimensional computed tomography (3D CT) scan have been used. But these alternative methods have some drawback. Passing of curved metal sound may be deleterious in some cases with inadvertent injury to the bladder outlet. Antegrade urethroscopy is also useful but is an invasive procedure. Sono-urethrography provides limited imaging of the posterior urethra and required a high degree of technical expertise. Although MRI is non-invasive, it is costly and difficult to interpret. Three-dimensional CT scan gives superior images but radiation exposure is markedly higher.[11]

For the above reasons an idea generated about opening the bladder outlet during ACUG by using a medicine that can relax and open the closed bladder outlet. As bladder outlet contains abundant α1A adrenoreceptor, thus blocking these receptors can facilitate bladder outlet opening.So, in this study Silodosin used, as it is an α-adrenoreceptor (AR) antagonist that has been approved by the United States Food and Drug administration in 2008 for the treatment of lower urinary tract symptoms associated with benign prostatic hyperplasia. It has the highest selectivity for the α1A-AR subtype predominantly located in the bladder neck, prostatic stromal and smooth muscle, with a 583fold and 56 fold higher binding affinity compared to the α1B and α1D AR subtypes respectively.[13] It has a very limited affinity for the α1B AR subtype located in the peripheral blood vessels and the α1D AR subtype located in the detrusor muscle of the bladder and the sacral region of the spinal cord.[14]

The uroselectivity of silodosin helps in maximizing the effect on bladder outlet and limiting the adverse effect on the cardiovascular system.[15] On the other hand, when compared to other α1-ARs blockers available on the market (e.g. alfuzosin, doxazosin, prazosin, tamsulosin, terazosin, and naftopidil), Silodosin was found the best uroselectivity.[16]Silodosin is administered orally and available in the market in two strength, 8mg and 4mg. It has a rapid onset of action and needs time to peak concentration approximately 2.6 hours.[17] It has minimum side effects e.g. retrograde ejaculation (28.1%), postural hypotension (3%, increased in patients >65 years of age) (drugs.com, 2020). But most of the patients remain sexually inactive after PFUDD, because of urethral injury associated erectile dysfunction (42%), painful penile erection and psychological upset.[18] Remaining patients, those were sexually active complains of reduced sexual pleasure and anejaculation. Only a few patients were complaining of retrograde ejaculation during sexual intercourse because of blockade in the pathway of sperm due to distraction defect in membranous urethra. That's why retrograde ejaculation is a common phenomenon in these patients. And after the administration of single-dose Silodosin, there is minimum chance of postural hypotension, if happened it can be easily managed by taking rest, fluid intake and omitting drugs prior that can interfere with Silodosin and causing hypotension. So, by using a single dose of Silodosin 3 hours before ACUG, bladder outlet opening and visualization of the posterior urethra can be possible by blocking α-adrenoreceptor. This helps in preoperative planning and avoidance of invasive procedures before definitive surgery.

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In Bangladesh, road traffic accidents are common. So, significant number of patients suffers from PFUDD in every year and almost half of these patients fail to open their bladder outlet on initial ACUG, thus fail to evaluate posterior urethra correctly. For which they need to do further investigations and invasive procedures causing delay in definitive treatment, increasing treatment cost and psychological upset. By adding capsule Silodosin before ACUG bladder outlet can be open in these patients, thus unnecessary investigations and invasive procedures can be avoided, treatment cost reduced and helps in definitive treatment protocol, which helps the patients financially, psychologically and physically. This study can help the urologist by preoperative evaluation of the length of the distraction defect correctly which is the key factor for planning the definitive surgical procedure. So, by reducing treatment cost of these patients and improving urological service by the urologist, this study ultimately helps to reduce the overall health related cost and improves overall quality of health service of the country.

Methods:

This quasi-experimental study (Self-control clinical trial) was done in the Department of Urology, Bangabandhu Sheikh Mujib Medical University (BSMMU),Dhaka, Bangladesh over a period of one year (October 2020 to September 2021).Male patients age between 18-65 years with pelvic fracture urethral distraction defect and suprapubic catheter in situ who failed to open the bladder outlet on initial antegrade cystourethrogram were selected as study subjects.Purposive consecutive type of sampling was done to select samples.Patients with partial disruption of the urethra (passing urine per urethra), patients with severe hepatic impairment orrenal impairment, patients with neurogenic bladder, patients with suprapubic catheter (SPC) with complications, like stone formation and patients with H/O bladder neck surgeries like bladder neck repair were excluded from the study.

Operational definitions:

Antegrade cystourethrogram (ACUG): It is defined as an imaging technique done by using fluoroscope after installing contrast solution to the bladder through suprapubic catheter in antegrade manner and patient is asked to void to see the bladder, urethra and vesicoureteric reflux (VUR) if present.[19]

Retrograde urethrogram (RGU): It is an imaging technique done by using fluoroscope after installing a contrast solution through the external urethral meatus in a retrograde manner to see the integrity of the urethra.[20]

Bladder outlet: Consists of the bladder neck, prostate, intraprostatic urethra.[11]

Orthostatic hypotension: Decrease in systolic blood pressure of 20 mm of Hg or a decrease in diastolic blood pressure of 10 mm of Hg within three minutes of standing when compared with blood pressure from the sitting or supine position.[21]

Pelvic fracture urethral distraction defect (PFUDD): The original term “Pelvic Fracture Urethral Distraction Defect” has duly been amended to Pelvic fracture urethral injury (PFUI). It was also previously thought to be a complete defect of the urethra but is now known to be a partial or complete disruption of the urethra; hence the change of terminology.[22] But in our study, we considered only complete disruption of urethra. So, we used the term PFUDD. So according to the American Association for the Surgery of Trauma (AAST) classification type 4 and 5 called PFUDD.[23]

After obtaining approval from the Institutional Review Board (IRB) of BSMMU, this quasi-experimental study was conducted in the Department of Urology, BSMMU. An informed written consent form was signed by all participants after being informed about the study, the possibility of response and the complications related to the procedure. Detail history was taken from all the patients, which included initial treatment for the urethral injury, any per urethral instrumentation or surgery, duration of SPC, and any renal or hepatic impairment. Also, the patients were asked about taking any drug that may interfere with Silodosin, like doxazosin, tamsulosin, itraconazole, ketoconazole, ritonavir, erythromycin, sildenafil, verapamil etc. These drugs were omitted one day before the procedure. Initial antegrade cystourethrogram films were checked to see the bladder outlet closure. Participants received a single dose of Silodosin 8mg capsule orally and waited for 3 hours to perform antegrade cystourethrogram. During that period patients were actively monitored and frequently asked for any symptoms of postural hypotension e.g. lightheadedness, blurry vision, confusion, nausea and fainting and patients were routinely monitored by measuring pulse and blood pressure.

After 3 hours, retrograde urethrogram was performed, then bladder was filled with a diluted contrast medium (made of 76% sodium diatrizoate with normal saline in the ratio of 1:4) through an indwelling suprapubic catheter under sterile conditions according to bladder capacity. Patients were monitored for any contrast reaction and precautions were taken to treat any kind of contrast reaction through the chance of contrast reaction was minimum. When the participants felt the normal desire to void bladder filling was stopped and voiding command was given, and conventional static x-ray films were taken. Then the x-ray films were reviewed and findings were noted about the opening of the bladder outlet and visualization of the posterior urethra. After 30 minutes of the procedure pulse and blood pressure were measured and after confirming hemodynamic stability patients were advised to go home and take tablet ciprofloxacin 500 mg twice daily for 5 days and also continue the previous drugs (if any drugs were omitted).

Statistics

After collection of all the required data, they were checked, verified for consistency and then tabulated into the computer using the Statistical Package for Social Sciences version 22.0 (SPSS v22). Statistical analyses were carried out by using the SPSS version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Variables were expressed as frequencies and percentages. Chi-square (X^2) test and unpaired t test, z test was done to evaluate the association between variables. A p-value <0.05 was considered as significant.

Results:

In this study, 35 patients with pelvic fracture urethral distraction defect with suprapubic catheter (SPC) in situ who failed to open the bladder outlet on initial ACUG were included. It was observed that more than one third (37.1%) of patients belongs to age 41-50 years. The mean age was 39.9±10.4 years with ranged from 20 to 56 years. It was observed that the mean SPC duration was 3.8±1.5 months which ranged from 3 to 9.7 months. Average diluted contrast 363±87.3 ml, ranges from 165 to 480 ml required to fill the urinary bladder to initiate voiding reflex.

TableI: Status of Bladder outlet on ACUG, 3 hours after giving Silodosin (n=35)

Status of Bladder outlet on ACUG	Number of patients	Percentage	*p* value
Open	32	91.4	0.001[s]
Close	3	8.6	

p value reached from proportion test (z test), Z value= 18.6

Categorical data (bladder outlet status) were expressed as frequency and percentage.

ACUG- Antegrade cystourethrogram.

The distributions of the study populations by the status of bladder outlet on ACUG after giving a single dose of Silodosin are shown in Table I. Bladder outlet open in 32(91.4%) was statistically significant (*p* value=0.001). Three patients (8.6%) failed to open the bladder outlet despite giving Silodosin. Patients who opened their bladder outlet had average age 38.8±10.2 years, ranges between 20-56 years. Patients who did not open their bladder outlet on ACUG had average age 44.7±10.6 years, ranges between 41-56 years. This is not statistically significant (*p* value=0.346). But patients with an age of above 50 years, 2 out of 4 patients (66.7%) were unable to open their bladder outlet. So, it is observed that with increasing age bladder outlet opening tends to decrease even after administration of Silodosin.

Table II: Comparison between bladder outlet status 3 hours after giving Silodosin and SPC duration(n=35)

	Open (n=32) Mean± SD	Close (n=3) Mean± SD	*p* value
SPC duration (months)	3.4±0.3	8.3±1.3	0.001[s]
Range(min-max)(months)	3-4	7.2-9.7	

p value reached from Unpaired t-test

Table II shows comparison of the study subjects by SPC duration. Patients who were able to open their bladder outlet after giving Silodosin had average SPC in situ for 3.4±0.3 months, ranges from 3-4 months. On the other hand, patients who failed to open their bladder outlet after giving Silodosin had an average SPC in situ for 8.3±1.3 months, ranges from 7.2-9.7 months. Here *p* value was measured from Unpaired t-test (*p* value=0.001), which is statistically significant.

Table III: Comparison of the study subjects by amount of contrast required to fill UB and to initiate voiding reflex during ACUG in both open and closed bladder outlet (n=35)

	Open (n=32) Mean± SD	Close (n=3) Mean± SD	*p* value
Contrast required to fill UB (ml)	378.8±73.7	180.0±15.0	0.001[s]
Range(min-max)	220-480	165-195	

p value reached from Unpaired t-test

Table III shows comparison of the study subjects by amount of contrast required to fill UB and to initiate voiding reflex during ACUG in both open and closed bladder outlet. Patients who were able to open their bladder outlet had average contrast required 378.8±73.7 ml, ranges from 220-480 ml. On the other hand, patients who failed to open their bladder outlet had an average contrast required 180.0±15.0 ml, ranges from 165-190 ml. Here *p* value measured from unpaired t-test (*p* value=0.001), which is statistically significant.

Table IV: Distribution of the study populations by complications of Silodosin and ACUG (n=35)

Complications	Number of patients	Percentage
Complications related to Silodosin		
Hypotension	0	0.0
Complications related to procedure		
Contrast reaction	0	0.0
Post procedure fever	2	5.7
No complications	33	94.3

Categorical data (bladder outlet status) were expressed as frequency and percentage.

The distributions of the study populations by complications are shown in table IV. No patients developed any complication after the administration of a single-dose of Silodosin. No patient developed contrast reaction. But two patients (5.7%) developed fever following combined retrograde urethrogram and antegrade cystourethrogram (RGU and ACUG).

Discussion:

This present study aims to evaluate the effect of Silodosin on bladder outlet in pelvic fracture urethral distraction defect patients during antegrade cystourethrogram. Initially our sample size was 28, but we included 39 patients from urology OPD, BSMMU considering all inclusion and exclusion criteria. Among them 4 patients unable to come on the study date, thus dropped out from our study. So, finally thirty-five male patients with pelvic fracture urethral distraction defect and suprapubic catheter in situ who failed to open the bladder outlet on initial ACUG were enrolled for evaluation.In this

study, it was observed that the mean age of the patients was 39.9±10.4 years, where minimum age was 20 years and maximum age was 56 years. Nagathan et al.[11], Ranjan et al.[24] & Satinder et al.[10] showed similar age distribution where they consider all patients >18 years of age. But Pujari et al.[25] included some patients <18 years of age, which was an exclusion criterion in this current study. Patients <18 years of age were excluded because the prostate is not well developed in this age group, that's why prostatic urethra and bladder neck injury is very common during pelvic fracture.

This current study only considered male subjects. The logic behind excluding female patient was a low risk of traumatic injury in the female urethra because of its short length and relative mobility due to the absence of rigid attachments to the pubis. Besides this, female urethral injury usually occurs as a partial tear of the anterior wall and rarely complete disruption of the proximal and distal urethra associated with vaginal tear that needs immediate repair.[5] Studies conducted by Nagathan et al.[11], Pujari et al.[25], Ranjan et al.[25] and Satinder et al.[10]also considered only male patients, which is correlates with this current study. In this study, all men had a SPC and the mean duration of SPC was 3.8±1.5 months varied from 3-9.7 months. Similarly Ranjan et al.[24] showed the mean duration of SPC was >3 months in all patients, which is similar to this study.

This study shows, on average 363±87.3 ml of diluted contrast, ranges from 165-480 ml is introduced to initiate voiding reflex. Here, amount of diluted contrast was not fixed, rather the amount of contrast used was the amount that was used to fill the urinary bladder at which the patient urged for micturition. Ranjan et al.[24] and Nagathan et al.[11] also used similar method to initiate voiding reflex. On the other hand, Satinder et al.[10] arbitrarily fixed 200 ml of diluted contrast, which is the minimum amount of contrast required for detrusor contraction. In this present study, among 35 patients 32 patients (91.4%) opened their bladder outlet after giving a single-dose of Silodosin. Studies conducted by Nagathan et al.[11], Ranjan et al.[24] and Satinder et al.[10] found similar results after giving single-dose of Silodosin capsule, where bladder outlet opened in 83%, 95% and 87.5% patients respectively. This is consistent with this study. On the other hand, Pujari et al.[25] showed, 53 patients out of 53 patients (100%) opened their bladder outlet after giving a single dose of Tamsulosin 0.4 mg capsule 10-12 hours before ACUG, which is slightly different from the current study. The success rate in opening bladder outlet with Silodosin was slightly lower than the success rate with Tamsulosin. This was not due to the lower efficacy of Silodosin in comparison to Tamsulosin in opening bladder outlet, rather probably due to more accuracy in recent studies with population selection, correct method of study, meticulous data collection and evaluation. Another reason may be, only a single study was done to see the efficacy of Tamsulosin. On the other hand, three studies were done before this current study to see the effect of Silodosin in bladder outlet opening.

In this study, three patients out of 35 patients (8.6%) failed to open their bladder outlet after giving Silodosin. In this current study, a correlation is found between SPC duration & the bladder outlet opening. Patients who opened their bladder outlet had a less mean duration of SPC (3.4±0.3) months. On the other hand, patients who failed to open their bladder outlet had a significantly higher mean duration of SPC (8.3±1.3) months (*p*-value is 0.001). The reason behind long standing SPC in these patients was initial inconclusive ACUG, inappropriate counseling and patient's financial crisis for the definitive treatment. Similar result was found by Nagathan et al.[11] in their patients. They found probable cause of bladder neck closer was long-standing SPC >10 months. Another correlation was found between the amount of diluted contrast given in urinary bladder to initiate voiding before antegrade cystourethrogram and bladder outlet opening. Results showed, those patients who opened their bladder outlet, allowed >200 ml of diluted contrast into their urinary bladder. On the other hand, patients who failed to open their bladder outlet allowed <200 ml of diluted contrast. P-value is 0.001, which is statistically significant. Similar result was found in the study conducted by Satinder et al.[10] They found that >200 ml of diluted contrast was able to contract detrusor muscle more effectively than <200 ml of diluted contrast.

So, in this study, it is observed that patients who had failed to open bladder outlet during ACUG did not allow filling of contrast to its normal capacity and diluted contrast back leaked by the side of SPC despite all maneuvers to prevent it. This failure was probably due to low compliant and small capacity bladder resulting from a long duration of SPC in situ. It was also observed that with increasing age bladder outlet opening tends to decrease even after administration of Silodosin. This current study shows, among 35 patients, no patients developed orthostatic hypotension. This result was consistent with the other four studies done by Nagathan et al.[11], Pujari et al.[25], Ranjan et al.[24] and Satinder et al.[10] Retrograde ejaculation is not evaluated in this study, because only a few patients were sexually active after PFUDD and retrograde ejaculation is a common phenomenon after sexual intercourse. Among 35 patients, 2 patients (5.7%) developed fever after retrograde urethrogram and voiding cystourethrogram. These two patients needed another 5 days of treatment with antibiotics. Those 3 patients who did not open their bladder outlet on repeat ACUG despite giving Silodosin, undergone further evaluation during operation by passing a curved metal dilator blindly through the suprapubic route in an antegrade manner and a metal sound through external urethral meatus (EUM) in a retrograde manner. But during the procedure, significant difficulties were faced negotiating metal dilator through the bladder neck to posterior urethra blindly. There was also an increased risk of bladder neck injury which might cause a significant amount of bleeding in this procedure. Ranjan et al.[24] described some other methods that can be used to evaluate posterior urethra in PFUDD patients. Magnetic resonance imaging (MRI) has been used to evaluate obliterated posterior urethral stricture. It uses T1 and T2 echo-weighed spin sequences after the distension of the urethra with a sterile lubricating jelly. It has been reported to produce excellent images of urethral stricture along with spongiofibrosis. Its disadvantages include its

limited availability and the high cost of the investigation. Ultrasonography (USG) has also been used to evaluate the urethra. The examination is performed after the installation of sterile saline into the urethra using 7.5-MHZ probes. The probe is placed on the ventral surface of the penis to evaluate the penile and bulbar urethra. The degree of spongiofibrosis can be assessed by noting the distensibility of the urethra. Sono-urethrography provides limited imaging of the posterior urethra. Transperineal imaging has been advocated to overcome this limitation. A further limitation is the high degree of technical expertise required for the scan as most radiologists do not routinely perform this investigation. The antegrade urethrogram technique has been described to visualize the proximal bulbar urethra in anterior urethra stricture patients. An optical cystoscope is passed antegrade via the suprapubic cystostomy tract into the posterior urethra, and a ureteric catheter is used to inject the contrast before imaging. This technique is not useful to evaluate the posterior urethra because the contrast rapidly passes into the bladder without entering the posterior urethra. Also, it requires anesthesia and an operating theatre complex.Joshi and Kulkarni[4] recently innovated and developed a new technique of performing MRI with full bladder with a clamped suprapubic catheter and lignocaine jelly in the anterior urethra. This gives excellent images. Three-dimensional computed tomography (3D CT) scan is another option, which gives superior images but associated with markedly significant radiation exposure.

Conclusion

Oral administration of single-dose Silodosin 3 hours before antegrade cystourethrogram is safe and conferred to a statistically significant increase in opening the bladder outlet in pelvic fracture urethral distraction defect patients. But with increasing age of the patients (>50 years) and increasing SPC duration (>8 months) bladder outlet opening tends to decrease even after administration of Silodosin.

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