

EFFECTIVENESS OF COMBINED INTRAURETHRAL LIDOCAINE WITH SEDOANALGESIA IN OPTICAL INTERNAL URETHROTOMY**İNTERNAL ÜRETROTOMİDE İNTRAÜRETRAL LİDOCAİNE İLE SEDOANALJEZİ KOMBİNASYONUNUN ETKİNLİĞİ**Cem Nedim YUCETURK¹, Türky CAKAN²**ABSTRACT**

AIM: In this study, our aim was to compare the effectiveness of combined intraurethral lidocaine and intravenous sedoanalgesia with intraurethral lidocaine alone in patients with undergoing optical internal urethrotomy (OIU) for primary anterior urethral strictures.

MATERIAL AND METHOD: A total of 76 patients who underwent OIU with anterior urethral stricture 2-3 cm long were analysed. Patients were divided into two groups. There were 36 patients in group 1 received only intraurethral lidocaine gel (12.5 g.% 2) and there were 40 patients in group 2 operated under intraurethral lidocaine gel anesthesia with intravenous sedoanalgesia (1 mg/kg Propofol and 1µg/kg Fentanyl). Anatomic location, length and etiology of the urethral stricture, procedure time, patients' follow-up and postoperative VAS scores were compared in two groups.

RESULTS: There was no significant differences between the two groups in the length of the urethral stricture, age and in the follow-up time. Most of the patients in two groups had iatrogenic as the cause of urethral stricture and the stricture was most commonly located in the bulbar urethra. The mean procedure time and VAS score in group 1 were significantly higher than group 2 (p<0.001). Recurrence of urethral stricture developed in 4 and 6 patients at a mean follow-up of 9.47 in group 1, 9.62 months in group 2. No serious complication was developed in both groups.

CONCLUSION: Intraurethral lidocaine with sedoanalgesia is effective and satisfactory with better pain control than intraurethral lidocaine alone in OIU for anterior urethral strictures.

Keywords: Internal urethrotomy, local anesthesia, sedoanalgesia, urethral stricture.

ÖZET

AMAÇ: Bu çalışmadaki amacımız, primer anterior üretral darlığı olan ve internal üretrotomi yapılan hastalarda uygulanan intraürettral lidokain ve sedoanaljezi kombinasyonu ile tek başına uygulanan intraürettral lidokainin etkinliğini karşılaştırmaktır.

GEREÇ VE YÖNTEM: 2-3 cm uzunluğunda anterior üretral darlığı olan ve internal üretrotomi yapılan 76 hasta analiz edildi. Hastalar iki gruba ayrıldı. Grup 1' de 36 hasta olup işlem sırasında sadece intraürettral lidokain jel (12.5 g.% 2) uygulandı. Grup 2' de ise 40 hasta vardı ve operasyon esnasında intraürettral lidokain jel ve intravenöz sedoanaljezi kombinasyonu (1 mg/kg Propofol and 1µg/kg Fentanyl) verildi. Gruplar, anatomik lokasyon, üretral darlığın uzunluğu ve etiolojisi, işlem süresi, takip süreleri ve postoperatif VAS skorlamaları açısından karşılaştırıldı.

BULGULAR: Gruplar arasında yaş, üretral darlık uzunluğu ve takip süreleri açısından anlamlı farklar yoktu. Üretral darlığın sebebi her iki gruptaki hastalarda çoğunlukla iatrojenikti ve daha çok bulber üretrada idi. Ortalama işlem zamanı ve VAS skoru grup 1 de grup 2 ye göre anlamlı olarak daha yüksekti. (p<0.001). Üretral darlık nüksü ortalama 9.47 ay takip sonucunda grup 1 de 4 hastada ve grup 2 de 9.62 ay ortalaması ile 6 hastada gerçekleşti. Hastalarda herhangi bir ciddi komplikasyon gelişmedi.

SONUÇ: Anterior üretral darlıkların internal üretrotomi ile tedavisi sırasında uygulanan intraürettral lidokain ve intravenöz sedoanaljezi kombinasyonu hastalarda ağrı kontrolü açısından tek başına uygulanan intraürettral lidokain anestezisine göre çok daha etkili ve memnuniyet vericidir.

Anahtar kelimeler: İnternal üretrotomi, lokal anestezi, sedoanaljezi, üretral darlık.

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INTRODUCTION

Optical internal urethrotomy (OIU) is a fast, simple and a widely accepted procedure which can be successfully performed in the management of male anterior urethral strictures and also can be safely done on an outpatient basis(1,2). It is considered an effective endourological approach for short segment anterior urethral strictures(<2 cm) (3). Although it is believed that length of the stricture is not important and can be safely conducted under local urethral anesthesia(4,5), performing optical urethrotomy under general or regional anesthesia provides a great confidence to the urologists(5). Several authors have shown that OIU can be performed comfortably by various local anesthesia techniques including topical anesthesia, spongiosum block, transperineal and urethrosphincteric blocks with good analgesic effects(3,6,7). These techniques offer several advantages like the elimination of the anxiety and discomfort associated with general anesthetic induction and the avoidance of expected risks due to general or spinal anesthesia.

In our hospital, we usually perform OIU under topical anesthesia for short urethral strictures(<1 cm) and those >1cm under spinal anesthesia or local anesthesia with sedoanalgesia as the first choice for our convenience. In this study, our aim was to compare the effectiveness of combined intraurethral lidocaine and intravenous sedoanalgesia with intraurethral lidocaine alone in patients with undergoing OIU for anterior urethral strictures (2-3 cm long).

MATERIAL AND METHOD

After getting Institutional Ethics Committee Approval (Ankara Training and Research Hospital Ethics Committee, Protocol no:0063, Date of approval:12.12.2018) and informed patients' consent, a total of 76 patients who underwent optical internal urethrotomy with anterior urethral stricture 2-3 cm were analysed between 2013 August and 2019 December retrospectively. Patients were divided into two groups. There were 36 patients in group 1 who received only intraurethral lidocaine gel (12.5g, % 2) during the procedure and there were 40 patients in group 2 operated under intraurethral % 2 lidocaine gel anesthesia with intravenous sedoanalgesia. The mean age of the patients in group 1 was 61.91 years and that of group 2 was 63.95 years. All anterior urethral strictures were primary and solitary lesions. Patients with multiple and posterior strictures, allergy to lidocaine, stricture of fossa navicularis, strictures due to lichen sclerosis infection, short stricture lengths and patients with significant cardiovascular disease or other serious diseases were excluded from the study.

We assessed the patients including anatomic location of the urethral stricture, stricture length on retrograde urethrogram, possible etiology of the stricture, procedure time, patients' follow-up and postoperative visual analogue scale (VAS) scores in two groups. Penil, penobulbar and bulbar locations were the anatomical classification of the

anterior strictures. The potential etiologic factors of the strictures were defined to be iatrogenic (depending on transurethral prostate resection, recurrent or prolonged urethral catheterization, transurethral instrumentation), inflammatory (prolonged urethritis), idiopathic or traumatic. Procedure time was measured from insertion of the cystoscope and urethrotome to the urethral catheterization. Stricture length was considered as 2-3 cm in two groups. All patients had been followed up at least 6 months.

Before the operation, urinalysis and urine culture were done to all patients to avoid urinary infection. We postponed the procedure if any suspicion of infection was detected in urinalysis. Patients with infection were treated by antibiotics until urine became sterile. For prophylaxis, Ciprofloxacin 500 mg bid were given to all patients starting on the same day with the operation until the catheter was removed.

All procedures were performed in the operating room. Patients were lied in the dorsolithotomy position. Patients in group 2 were monitored continuously till the end of the procedure. Electrocardiogram, blood pressure, peripheral oxygen saturation and heart rate were watched carefully by the anesthesiologists.

After cleaning the genitalia with %10 povidone-iodine solution, lidocaine gel (12.5g, %2) was instilled into the urethra and penis was clamped for 10 minutes in group 1. The second group received intraurethral lidocaine gel (12.5g, %2) at first and then intravenous sedoanalgesia including 1mg/kg propofol and 1µg/kg fentanyl were administered before starting OIU. Optical internal urethrotomy was done with a cold-cutting urethrotome under guidance of a 0.035 inch guidewire. It was placed up the urethra far from the stricture and was incised carefully at the 12 o'clock position until the full thickness of the fibrous scar was divided and normal tissue below the stricture had been seen and made sure free passage of the 21 F sheath cystoscope into the bladder. After watching the patients for about 6 hours they were discharged on the same day with a 16F foley urethral catheter for 3 days.

At the end of each operation, to assess pain, VAS was used in the recovery room within 60 minutes after surgery. Pain status due to patients was graded from 1 to 10. In practical use, VAS scores were grouped into 4 categories. VAS score 0 means no pain, 1-3,4-7,8-10 were considered as mild, moderate and severe pain, respectively.

Statistical Analysis

Statistical Package for Social Sciences version 21.0 Software for Windows (SPSS 21.0, Inc., Chicago, IL) was used for descriptive statistics, independent t-test and Chi-square tests. Normal distribution assumption was tested with Kolmogorov-Smirnov and Shapiro-Wilk tests and Kurtosis and skewness values were also

examined. It was found that the data were normally distributed for both groups. In this study, Pearson's Chi-square test was used for the categorical variables and independent t-test was used for continuous variables. In all tests, $p < 0.05$ was considered to indicate statistical significance.

RESULTS

The study included 36 patients in group 1 and 40 patients in group 2. Mean patient age in group 1 was 61.91 ± 10.53 and 63.95 ± 10.78 in group 2 ($p = 0.40$). There was no significant differences between the two groups in the length of the urethral stricture and the follow-up time (Table 1). The etiology and anatomical location of the stricture was not different in two groups (Table 2). Most of the patients in two groups had iatrogenic as the cause of urethral stricture and the stricture was most commonly located in the bulbar urethra (Table 2).

Table 1: Comparison of patient characteristics in both groups

	Intraurethral lidocaine only (Group 1) n: 36 (mean \pm SD)	Combined sedoanalgesia with intraurethral lidocaine (Group 2) n: 40 (mean \pm SD)	p value*
Age	61.91 \pm 10.53	63.95 \pm 10.78	0.4
Procedure time (min)	22.05 \pm 3.12	12.7 \pm 3.47	<0.001*
Follow-up (months)	9.47 \pm 2.37	9.62 \pm 2.39	0.78
Length of the stricture (mm)	23.77 \pm 2.67	23.15 \pm 1.96	0.24

* $p < 0.05$; statistically significant

Table 2: Etiology and location of the strictures

	Group 1	Group 2	p value*
Etiology			
Idiopathic	2 (5.5%)	3 (7.5%)	0.85
Iatrogenic	20 (55.5%)	23 (57.5%)	
Traumatic	2 (5.5%)	3 (7.5%)	
Inflammatory	12 (33.3%)	11 (27.5%)	
Stricture location			
Bulbar	26 (72.2%)	28 (70%)	0.42
Penobulbar	9 (25%)	8 (20%)	
Penil	1 (2.8%)	4 (10%)	

* $p < 0.05$; statistically significant

The mean procedure time and VAS score in group 1 were significantly higher than group 2 ($p < 0.001$). In group 1, 2 patients had experienced mild pain, 30 patients had moderate and 4 patients had severe pain. Due to the severe pain, we turned to general anesthesia in 4 patients. In group 2, 6 patients had no pain, 30 patients had mild and 4 patients had moderate pain during the

procedure. None of the patients had remarked severe discomfort (Table 3) or needed general anesthesia. All patients in group 1 and in group 2 voided well after catheter removal. No anesthesia-related complications were developed in group 2.

Table 3: Comparison of VAS scores between groups

	Group 1	Group 2	p value
VAS score (mean \pm SD)	6.63 \pm 1.09	1.75 \pm 1.14	<0.001*
No pain	0	6	
Mild pain	2	30	
Moderate pain	30	4	
Severe pain	4	0	

* $p < 0.05$; statistically significant

Recurrence of urethral stricture developed in 4 (11.1%) patients at the penobulbar urethra at a mean follow-up of 9.47 months in group 1 and occurred in 6 (15%) patients at the bulbar urethra at a mean follow-up of 9.62 months in group 2. Repeat internal urethrotomies were performed at a later day for these patients.

No serious complication was developed during the operations in both groups. Mild bleeding in 6 patients and infection in 4 patients were seen after the procedure may be due to the contact of the patient with the urethral catheter after the procedure. Patients were advised to drink more fluids for bleeding and for infection antibiotics were started due to the urine culture.

DISCUSSION

When modern-day cold-knife internal urethrotomy procedure was described by Sachse in 1974, it has widely been practised the most popular method as first-line treatment in short segment anterior urethral strictures among urologists all over the world (8). Its success rate, simplicity, less morbidity, short procedure time and less invasiveness have made this technique preferable and used extensively (9). Although OIU is not mentioned as a definite treatment for urethral stricture, it still plays an important role in the urologist's practice. It is frequently preferred in short urethral strictures and usually done as an outpatient procedure. However, patients with requiring recurrent OIU or urethral dilation (>2 procedures) in anterior urethral strictures should be directed to experienced centers for urethroplasty.

When OIU performed under local anesthesia, we see some major advantages like saving time and avoiding the risks of general or spinal anesthesia as well (4,5,10). Most commonly OIU has been performed under general or regional anesthesia but to perform OIU under local anesthesia also adds the additional benefits of reducing cost and time for the patient. The patient can not need to stay at hospital and return to work in a short time after the procedure. Finally, outpatient procedure, local anesthesia and no need to stay at hospital decrease the total cost seriously. Local anesthesia

with lidocaine has been studied, but confusing results have been revealed(3,7,11). Some studies demonstrated that intraurethral lidocaine gel had been safely used for urethral strictures and the procedure was well tolerated by the patients. Altınova and Turkan performed 32 internal urethrotomy to 28 patients under local urethral anesthesia with lidocaine gel (12.5 gr, 2%) and revealed the overall success rate 92.9% and 89% of patients only had mild pain on a VAS(11). Kreder et al performed OIU using topical anesthesia with lidocaine in 18 patients, 3 of whom could not stand the procedure because of severe pain(3). In our recent study, using intraurethral lidocaine 2%, OIU was successfully completed in 151 of 157 patients whose urethral strictures were less than 2 cm long. The overall success rate was 96.1%. A total of 125 patients experienced mild pain, 26 patients moderate and 6 patients severe pain. Patients who felt moderate discomfort needed a second dose of intraurethral lidocaine gel. After the additional administration of lidocaine gel, the discomfort disappeared completely and allowed us to finish the procedure comfortably(2). Munks et al performed OIU under local anesthesia to 33 patients and found the overall success rate 91%(10). Additionally, Ye et al tried topical anesthesia to 4 patients with anterior urethral strictures for internal urethrotomy, but all patients reported severe pain during the incision of the fibrous scar tissue and concluded that topical anesthesia is unsatisfactory(12). However in our present study of 36 patients in group 1 who underwent OIU using intraurethral lidocaine gel, 2 patients experienced mild, 30 patients moderate and 4 patients severe pain. Patients with severe pain were operated under general anesthesia. The overall success rate was 89% with the recurrence in 4 patients at the penobulbar urethra at a mean follow-up of 9.47 months.

Ye et al described spongiosum block anesthesia technique which was the injection of lidocaine subcutaneously into the spongiosum of the glans (12). The internal urethrotomy was completed successfully in 23 patients. 22 patients experienced no pain or any discomfort. They stated that this technique was very satisfactory and can be performed safely to the patients with short anterior urethral strictures in the daily practice. However, from the study we understood that this anesthetic technique was helpful while performing OIU in short anterior urethral strictures (<2cm), but is it really effective in long anterior urethral strictures? The answer may be in the study of Kumar et al where the procedure was successfully done in all patients without any pain or mild pain with combined spongiosum block and intraurethral lignocaine although the length of the strictures lied between <1cm, 1-3 cm and >3 cm long (9).

Two similar randomized controlled trials by Biswal et al. and Ghosh and his colleagues showed the superior pain control and anesthetic effect of ICSB. They compared local anesthesia using intraurethral 2% lignocaine jelly with intracorporeal spongiosum block in OIU for short segment anterior urethral strictures (4,13). Both intraoperative and postoperative VAS scores were significantly lower in the

ICSB group. Patients were very satisfied with the anesthetic effect of ICSB and their preference is ICSB if the urethral stricture recurs in the future (4). The authors concluded that ICSB could be a useful and feasible technique with better pain control than intraurethral lignocaine jelly anesthesia in OIU.

Ather et al compared OIU performed under general or major regional anesthesia with spongiosum block anesthesia and sedation. They found the first year recurrence and pain score on the VAS was not different between the two groups (5). They concluded that a spongiosum block with sedation was effective and satisfactory for surgical procedures in the anterior urethral strictures. In our study, intraurethral lidocaine with sedoanalgesia has better pain control and a useful anesthesia technique for OIU in the patients with high risk for general or regional anesthesia. The VAS scores show that the anesthetic technique is at least as effective as general anesthesia.

Almost in all studies, ICSB was declared as an effective technique than intraurethral lidocaine anesthesia for providing pain relief during OIU and also a safe procedure. In high risk patients for general anesthesia, ICSB could be the first choice in OIU among the other anesthetic approaches. An urologist can perform ICSB in OIU on an outpatient basis means decreased operative time and low costs. But there is a disadvantage that should not be ignored which may be the patient's anxiety in the preoperative period. Patients may give up from the procedure with the thought of an injection into the glans. In our institution, although all advantages of this technique are informed to the patients, their anesthetic preference is always in the direction of intraurethral lidocaine, sedoanalgesia combined with intraurethral lidocaine or regional anesthesia in OIU.

Uzun et al compared OIU in short anterior urethral strictures under local urethral anesthesia, with or without sedoanalgesia (14). Internal urethrotomy was successfully performed in all patients in both groups but two patients in the local urethral anesthesia group were operated under general anesthesia due to their intolerability. Mean pain VAS scores were significantly lower in local urethral anesthesia with sedoanalgesia group. They also emphasized the importance of stricture length on the pain and discomfort. In the current study, we compared OIU in long anterior urethral strictures (>2cm) under local urethral anesthesia, with or without sedoanalgesia. The mean procedure time and pain VAS scores were significantly lower in group 2 ($p < 0.001$). Although Uzun and his colleagues did not advise their anesthesia protocol in OIU to the long urethral strictures, we do not agree with this idea and strongly suggest our sedoanalgesia protocol in the treatment of the long anterior urethral strictures with short operative times, for surgeon's and patients' comfort and cost benefits. A quick return to the daily activities plays an important role in the patients' own selection.

In OIU, sedoanalgesia with Midazolam has been reported for decreasing anxiety perioperatively and postoperatively without any serious effects on vital signs in a healthy patient (5,15). Uzun et al mentioned that postoperative nausea and headache were eliminated when compared with the patients received general or spinal anesthesia. They also emphasized that shorter anesthesia and recovery time and low VAS scores with Midazolam were not only provided the surgeon a great confidence but also was very important on his decision about anesthesia before the procedure (14).

Intravenous administration of propofol with the advantages of rapid effect and its anesthetic activity which lasts quickly with the end of drug administration due to the high lipid solubility that makes this drug more preferable at our hospital in OIU for long anterior urethral strictures. After a single dose of injection, propofol levels rapidly decrease due to both redistribution and elimination. After the intravenous administration, it is rapidly and widely distributed to highly perfused tissues such as the brain. (16) Although there are some important side effects with propofol anesthesia, including respiratory depression, hypotermia and myoclonus, we did not encounter such propofol related complications mentioned above. All patients in group 2 were satisfied with the anesthetic effect of propofol sedoanalgesia and agreed to have the same anesthesia if needed in the future.

In our current experience, although the length of the strictures were 2-3 cm long, our recurrence rates were 11.1% and 15% at a mean follow up of 9.47 and 9.62 months in group 1 and group 2, respectively. Location of the recurrence was at the bulbar urethra in group 2 and at the penobulbar urethra in group 1. Our high success rate might depend on some factors like all anterior urethral strictures were adequately incised to healthy spongiosum in both groups, antibiotic prophylaxis were given to all patients starting on the same day with the operation and continued for 3 days and finally duration time for urethral catheterization after IU was only 3 days. In this study, all patients in group 2 were very pleased by combined sedoanalgesia with intraurethral lidocaine gel during OIU, but this was not told for the patients in group 1. Although they all tolerated OIU except 4 patients, the majority of the patients was in consensus with an another anesthetic technique.

The limitation of our study can be the lack of some comparative studies about this anesthetic technique. A prospective study should be done with similar patient characteristics and a group with general/regional anesthesia may be compared with combined sedoanalgesia and intraurethral lidocaine to find out the patients' preference during OIU. Identifying the site, extent of the stricture and number, we only used retrograde urethrography not sono-urethrography which investigates the degree of spongiofibrosis, the main cause of recurrence. The detection rate with sono-urethrography may increase success rate and prolong the

recurrence period. Although the lack of intraoperative VAS scale can be considered as the other limitation of our study, postoperative VAS scores gives enough information to us about the effectiveness of this anesthetic technique. OIU in long anterior urethral strictures with intraurethral lidocaine only, carry out some complications while cutting the scars in high-risk patients. Before OIU, a detailed history and physical examination are not only very important to prevent possible comorbidities but also help the urologists while deciding the anesthetic procedure.

CONCLUSIONS

Intraurethral lidocaine with sedoanalgesia is effective and satisfactory with better pain control than intraurethral lidocaine alone in OIU for long anterior urethral strictures when compared with intraurethral lidocaine anesthesia. In our opinion it should be the preferred anesthetic technique by the urologists with a greater confidence in OIU regardless of the length of stricture but further randomised prospective studies should be designed in order to choose the best anesthetic technique for long anterior urethral strictures.

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