Double-J ureteral stent under local anesthesia for women

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Introduction: *Ureteral stent placement is a key urologic procedure used to manage ureteral obstructions. It is usually performed under general anesthesia (GA) with its inherent risks. The objective was to evaluate safety, feasibility and tolerance of ureteral stent placement under local anesthesia (LA) in women.*

Materials and methods: *From January 2010 to January 2013, we prospectively and consecutively reviewed all female patients who had an urgent retrograde ureteral stent placement under LA. Only primary stent placements were included in the study. Pain was assessed after surgery by Visual Analog Scale (VAS) and pain and comfort assessment during stent placement were reported. We compared outcomes and tolerance with patients under general anesthesia (GA) matched by age and operatives indications during the same period.*

Results: *We included 36 patients (18 under LA and 18 under GA) with a mean age of 59.4 +/- 22.4 years. The mean operative time was 24.4 +/- 12.9 min and 18.8 +/- 6.5 min in LA group and GA group ($p = 0.110$), respectively. One patient needed GA due to a poor tolerance. The mean perioperative VAS scores under LA and GA were 5.89 +/-2.95 and 2.06 +/- 2.67 ($p < 0.0001$), respectively. There were no intraoperative complications in either group. The procedure was painful for 16 (88.8%) patients from the LA group and 9 (50%) patients would not accept to undergo this intervention under LA again.*

Conclusion: *Ureteral stent placement under LA in women can be performed safely and effectively. However, this procedure is painful and should be proposed only to selected cases.*

Key Words: ureteral stent, local anesthesia, tolerance, acute renal colic, female

Introduction

Ureteral stent placement is a key urologic procedure used to manage intraluminal or extraluminal ureteral obstructions.[1,2] It is usually performed under general anesthesia (GA) with its inherent risks (tracheal intubation complications, cardiovascular or cerebrovascular complications, and adverse reactions such as malignant hyperthermia).[3] However, the stent insertion is possible under local anesthesia (LA) for women, hence to the shortness of the female urethra. Consequently, several studies reported the feasibility and the tolerance of stent insertion under LA using flexible cystoscopy.[4-6] Nevertheless, the use of flexible cystoscopy required difficult sterilization protocols, which are not always possible in emergency cases. On the other hand, rigid cystoscopy is commonly used in LA during classical urological consultation for women. In addition, the

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sterilization protocol of rigid cystoscopy is standard and could easily be used in emergency cases.[7] Recently, Silaligam et al reported the feasibility of office-based stent placement for renal colic under LA with rigid cystoscopy.[8] Therefore, the development of ureteral stent placement under LA in women could avoid unnecessary risks, side effects and costs associated with GA. The objectives of this study were to assess safety, feasibility and tolerance of ureteral stent placement performed under LA for women.

Materials and methods

We performed a prospective observational study and included all the urgent retrograde double-J ureteral stents placed under LA from January 2010 to January 2013, in women over 18 years old, at the Angers University Hospital. A written consent to participate in the study was obtained for each patient.

The following data were evaluated: demographic data, ASA score, operative indications, reasons leading to LA, operative time, time in the operating room, success or failure of the stent placement, use of GA, pre and postoperative pain evaluated by Visual Analogue Score (VAS), and subjective patient operative experience evaluated by a survey. Operative time was defined as the total installation time in gynecological position. GA contraindications were left to the discretion of the attending anesthesiologist. Complications were ranked according to the Clavien and Dindo classification.[9] We compared outcomes with consecutive patients who had stent placement under GA during the same period, matched according to the nature of the ureteral obstacle (intraluminal or extraluminal) and the age (by decades). The patients who required another surgical procedure during the same intervention, ureteral catheter stenting or stent exchanges, were excluded from the present study. Pain and comfort assessment during stent placement were reported to survey. The survey was completed with one medical staff member after surgery.

The local anesthesia protocol was approved by the anesthesiologist team. Each patient received an anxiolytic premedication (alprazolam 0.25 mg) 30 minutes before the operation and 1 gr of paracetamol on their entrance to the operating room. The patients were given 1% lidocaine jelly per urethra and a bladder anesthesia was made with intravesical instillation using a mixture of lidocaine 1% (60 mL) and bicarbonate 14% (60 mL) for at least 5 minutes.

If there was a poor tolerance or difficult stent placement, the patient underwent additional sedation using midazolam (2 mg). GA was decided in case of failure. Double pigtail ureteral stent was performed according to a standard protocol: the patient was placed in the gynecological position and cystoscopy was performed using a 21F rigid cystoscopy. The ureteral orifice was cannulated with a sensor guide wire used for a ureteral catheterization. A retrograde pyelography was performed through this ureteral access (except in case of pregnancy). The 7F double pigtail ureteral stent was subsequently placed and positioned under fluoroscopy.

Statistical analysis was performed using the Student's t-test for quantitative variables expressed as +/- SD and Chi^2 test for categorical variable expressed as n (%). A p value < 0.05 was considered significant.

Results

Patient characteristics

During this period, 36 women were included (18 under LA and 18 under GA) with a mean age of 59.4 +/- 22.4 years. Ureteral stent placement was performed due to intraluminal or extraluminal obstacles in 24 (67%) and 12 (33%) cases, respectively. LA indications were severe respiratory failure in 1 case (5%), hyperkaliemia in 1 case (5%), ongoing pregnancy in 5 cases (28%) and patient's choice in 11 cases (61%). There was no significant difference between the two groups except for pregnancy status (p = 0.045). Patient characteristics are summarized in the Table 1.

TABLE 1. **Patient characteristics according to anesthesia**

	General anesthesia (n = 18)	**Local anesthesia (n = 18)**	**p value**
Age (years)	57.9 +/- 23.9	58.5 +/- 27.5	0.934
Preoperative pain (VAS)	4.59 (0-10)	2.57 (1-7)	0.954
Obstacle			
Intraluminal	12 (50%)	12 (50%)	1
Extraluminal	6 (50%)	6 (50%)	1
Pregnancy	0 (0%)	5 (27.7%)	0.045

VAS = Visual Analogue Scale

TABLE 2. **Perioperative data according to anesthesia**

	General anesthesia	Local anesthesia	p value
Operating room time (minutes)	65 +/- 31.5	52.65 +/- 22.9	0.193
Operative time (minutes)	18.5 +/- 6.5	24.4 +/- 13.28	0.099
Intraoperative pain (VAS)	2 +/- 2.6	5.9 +/- 2.9	< 0.0001
Postoperative analgesic			
Level I	18 (100%)	18 (100%)	1
Level II	2 (11.1%)	6 (33.3%)	0.228
Level III	1 (5.5%)	2 (11.1%)	1
Postoperative complications			
CDS II	1 (5.5%)	4 (22.2%)	0.338
CDS IV	0 (0%)	1 (5.5%)	1

Perioperative data

The mean operative time was 24.4 +/- 12.9 minutes under LA and 18.8 +/- 6.5 minutes under GA (p = 0.110). The mean time in the operating room was 52.2 +/- 22.3 minutes under LA and 66.3 +/- 30.9 minutes under GA (p = 0.104). The mean perioperative VAS scores under LA and GA were 5.89 +/-2.95 and 2.06 +/- 2.67 (p < 0.0001), respectively. Among patients in the LA group, one woman needed GA and two required additional sedation (using midazolam) due to poor tolerance of the procedure. The stent was placed in all of the cases. There were no intraoperative complications in either group. In the LA group, postoperative complications ranking grade II occurred in four patients (1 hypoxia, 1 partial epilepsy attack, 1 orthostatic hypotension, 1 pyelonephritis) and grade III in one patient (urinary sepsis). In the GA group, one patient presented a grade II complication (pyelonephritis). Perioperative data are summarized in Table 2.

Survey

The survey results are presented in Figure 1. LA was associated with more pain and discomfort than GA (p = 0.012, p = 0.008). Women were satisfied with their care in 11 (61.1%) cases under LA and 15 (83.3%) cases under GA (p = 0.264), and very satisfied in 7 (55%) cases under LA and 3 (16.6%) cases under GA (p = 0.264). Finally, 16 out of 18 (88.8%) patients from the LA group felt the procedure was painful and 9 (50%) would not agree to undergo this intervention under LA again.

Discussion

In our study, we confirm that ureteral stenting in women is feasible under LA; but that half of the patients would not choose LA again in case of new ureteral stent placement.

Indeed, the main difference we observed between LA and GA is higher pain under LA.

Regarding pain assessment, Adeyoju et al evaluated the feasibility of ureteral catheter or double-J stent placement using flexible cystoscopy and LA using lidocaine jelly per urethra and preoperative analgesia. In their series of 20 patients (7 men and 13 women), 5 of 6 patients had double-J stents inserted successfully (one failure because of an inability to visualize the ureteral meatus). Among the 17 ureteral catheter placements, only three patients reported discomfort and would have preferred GA.[5] Jeong et al reported a

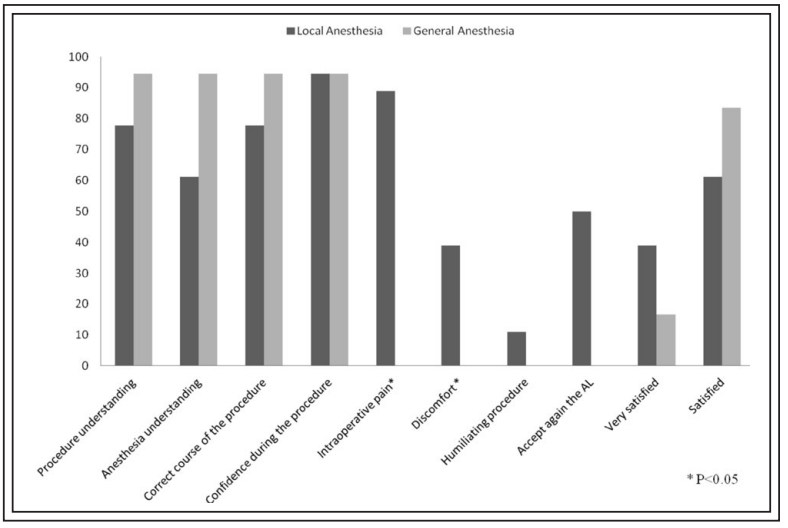

Figure 1. Survey results.

mean intraoperative VAS of 4.48 +/- 2.07 for patients who had double-J stents inserted and 3+/- 1.9 for patients who underwent cystoscopy only. Some factors were predisposing to pain: age (< 40 years), environment (urban people), sex (male), education, ureteral stent size, and operative time.[10] In another study assessing outcome of rigid ureteroscopy laser treatment under LA for lithiasis disease, there was no significant difference for intraoperative VAS between rigid ureteroscopy and cystoscopy (3.36 versus 3.13 $p < 0.05$).[11] In our study, despite an analgesia protocol for LA procedure, double-J stent placement remained painful with a mean intraoperative VAS of 5.89 +/- 2.95. The procedure was significantly more painful and uncomfortable in the LA group ($p = 0.012$ and $p = 0.008$), and only 9 (50%) women would accept this intervention under LA another time. However, patients' satisfaction analysis is questionable; indeed, all of them were satisfied with their surgery and seven were very satisfied in the LA group. Satisfaction was not correlated to pain or preoperative information. That is paradoxical and would be explained by the way in which the survey was performed. The survey was completed with a member of the medical staff and in this context the patients may have been reluctant to express their dissatisfaction. Considering this result, it seems that ureteral stent placement is poorly tolerated and, in contrast with the literature, should not be routinely proposed.

Local anesthesia mode differed according to studies published on this subject. LA using lidocaine jelly perurethra was the most frequently technique.[4,8,11] Several studies proposed preoperative pethidine intramuscular injection,[4,10,11] or diclofenac suppositoru.[5] MacFarlane et al proposed systematic diazemuls sedation (2.5 +/- 10 mg intravenously) in addition to LA.[4] In our study, we used both lidocaine jelly per urethra and bladder anesthesia with lidocaine intravesical instillation. Intravesical instillation has been reported as the most effective anesthesia in botox instillation under LA.[12] However, our results showed that this LA protocol is not sufficient to ensure adequate analgesia. Then, using little sedation or hypnosis would reduce pain during the procedure and could be proposed.[13]

According to the risks associated with general anesthesia, LA should be used when possible to reduce operative time and operative morbidity. For example, in case of pregnancy: renal colic affects 0.026% to 0.5% of pregnant women during the second and the third trimester of the pregnancy[14] (80% to 90% of the cases). The risks of anesthesia during pregnancy are higher due to soluble gases from anesthesic agents passing through the hematoplacental barrier (which are prohibited in the first trimester), intubation difficulty (hypoxemia risk because of the lack of airway control), aortocaval compression due to the gravid uterus, and, full stomach phenomenon from 12-24 amenorrhea weeks (Mendelson's syndrom). All these risks (teratogenic, premature delivery, miscarriage) explain why local anesthesia is preferred for pregnant women undergoing surgery.[15] Several studies have already reported the feasibility of double-J stent placement under LA.[4-6,8,10] Sivalingam et al compared the success, the postoperatives complications, and the cost of office stent placement for renal calculi under LA versus GA in 119 patients (73 under GA and 46 under LA). In the LA group, cystoscopy was performed with 21F rigid cystoscopy for female patients and flexible cystoscopy for male patients. The success rate and postoperative complications were similar in the two groups. The average cost per procedure was four times lower in the LA group ($11037 versus $30741). But, perioperative pain and tolerance assessment were not reported in this study.[8] Our present study confirms the feasibility of ureteral stent placement under LA for women. The only failure was due to a poor tolerance of the procedure and subsequently required GA. No significant differences in operative time and occupancy room were observed between the two groups. However, even if the procedure was performed under LA, there was a mean operative time of 24 minutes and a mean occupancy of the operative room of 55 minutes.

The main limitation of this study is the small number of patients which did not allow us to determine the risks and the causes of poor tolerance. The second bias is a selection bias in the LA group because patients were selected with regard to their wishes or in case of imperative indications. Nevertheless, we would perform this observatory study as a first step before a prospective randomized study comparing GA and LA for ureteral stent placement. According to our results, we reject ureteral stent placement under local anesthesia in women except in the case of imperative indications. In addition, we consider unethical to perform the prospective randomized study on this question.

Conclusion

Double-J ureteral stent under LA for women with rigid cystoscopy is safe and feasible. However, our results showed poor tolerance among patients despite maximal analgesia protocol. Consequently, this procedure should be proposed only in selected cases. □

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