

The use of local anesthetic gel during retrograde urethrography: does it cause a false negative result?

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Abstract

Purpose To investigate the implication of topical urethral anesthetic gel on the evaluation of retrograde urethrography (RGU)

Material and methods In this prospective study, 20 patients with a mean age of 46 years were enrolled. All these patients were subjected to RGU because of suspecting a urethral stricture. Of these 13 had a history of open or endoscopic urethral manipulation, while seven had no such history. In all patients 10 ml of Gelicain gel 2% (lidocainhydrochloride) was used as local anesthetic gel at temperature of 22°C. The injection was made gradually over 10 s. The first set of RGU was done without local anesthesia and the second image was taken after 10 min of instillation of 2% gelicain gel. All images were evaluated by the same radiologist. The diameter of the urethra was measured by capture screen during fluoroscopy immediately distal to the stricture site in case of urethral strictures and at the middle of the bulbous urethra in other cases.

Results In all patients, the mean diameter of the urethra at the selected site was 8.7 ± 2.5 mm before and 9.4 ± 2.9 mm after instillation of local anesthetic gel ($P = 0.005$). The stricture was diagnosed in 13 cases while seven patients had no stricture. The clinical diagnosis of a possible stricture was the same before and after instillation of the local agent in all patients.

Conclusion Instillation of the local anesthetic gel before RGU produces a slight but statistically significant increase in the diameter of the urethra at the selected sites. However, neither the radiologic reading of RGU nor the clinical diagnosis of a possible stricture was changed because of this increment.

Keywords Anesthetic gel · Male urethra · Penis · Retrograde urethrography · Urethral stricture

Introduction

Retrograde urethrography (RGU) is an important means to visualize the anterior urethra in men in cases of suspected urethral injuries and strictures. Due to the discomfort perceived by most patients during RGU and cystoscopy, some investigators advocated the routine use of local anesthetic gel before these procedures [1, 2]. Before the use of these gels, we must be sure that

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they will not affect the reading of this diagnostic procedure. Our prospective study aims at studying the impact of anesthetic gels on the evaluation of RGU.

Material and methods

The study included 20 patients, in whom a urethral stricture was suspected. Age ranged from 17 to 62 years with a mean \pm SD of 45.6 ± 12.5 . In all patients, RGU was performed in the right oblique position. The first set of images was taken without anesthetic gel, while the second set was taken 10 min after the instillation of the local anesthetic gel. The gel used was 2% gelicain gel (lidocainhydrochloride, Delta select, Germany). The amount of gel given was 10 ml and it was delivered over 10 s and at room temperature of 22°C. The diameter of the urethra was measured by capture screen during fluoroscopy immediately distal to the stricture site in cases of urethral strictures and at the middle of bulbous urethra in other cases. History of endoscopic or open surgical manipulation of the urethra was found in 13 out of 20 patients. The other seven patients showed no such a history. Reading of the retrograde urethrography was made by the same radiologist.

The differences in measurement of urethral diameter were statistically evaluated by *t*-test for paired samples.

Results

The mean diameter of urethra at the chosen site was 8.7 ± 2.5 mm before instillation of the local anesthetic gel, while it was 9.4 ± 2.9 mm after instillation. The difference was statistically significant ($P = 0.005$; Table 1). Out of the 20 patients, 13 were found to have a stricture and the other seven showed normal images (Figs. 1, 2). Clinical and radiological diagnosis of a possible stricture was the same before and after instillation of the local agent in all patients. In addition, the therapeutic decision was not changed after instillation of the anesthetic agent. To state these results another way, there were neither false

Table 1 The diameters of urethra for all patients before and after instillation of local anesthetic gel

Case no.	Diameter of urethra before instillation (mm)	Diameter of urethra after instillation (mm)
1	10	12
2	11	12
3	7.5	8
4	6.4	6
5	8	10
6	9	10
7	6	6
8	6	7
9	6	8
10	10	9
11	11	11
12	9	9
13	7.5	7
14	10	10.5
15	8	9
16	8	8
17	1.1	1.2
18	7	7
19	7.5	8
20	17	19
Mean diameter \pm SD	8.7 ± 2.5	9.4 ± 2.9

* $P = 0.005$

positive diagnosis of stricture in the first set of RGU (without local anesthesia), nor false negative diagnosis of stricture in second set of RGU (with local anesthesia).

Discussion

The use of local anesthetic agents before endoscopic intervention is common in urologic practice. However, the real value of urethral topical agent is not well defined. Some studies reported that there is no significant difference in patient discomfort between instillation of local anesthetic gel versus lubricating water-soluble gel (Aguagel) during flexible cystoscopy [3–5]. On the other hand, other investigators showed that instillation of intravesical anesthetic agent is beneficial and can be used even as topical agent for bladder biopsy [1, 2]. Similarly, we used local anesthetic gel before urethral injection of contrast material during RGU to decrease the urethral discomfort inflicted by the maneuver. However, we were

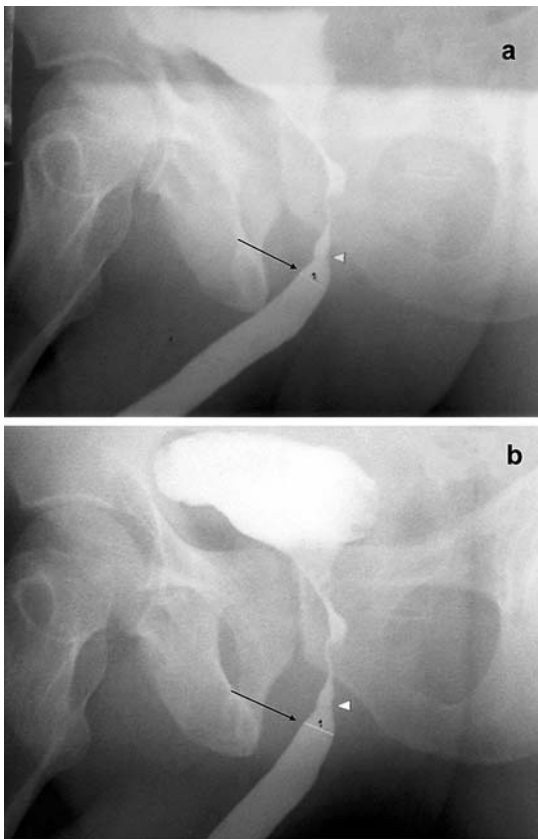


Fig. 1 RGU without local anesthetic agent (**a**) and with local anesthetic agent (**b**) for patient with urethral stricture. The long arrow refers to the measured diameter of the urethra immediately distal to stricture

afraid from underestimation of the urethral stenosis during RGU, due to the expected dilatation of urethra or relaxation of external sphincter induced by the anesthetic agent. Therefore, we conducted this study to investigate whether the administration of local anesthetic gel will have a false impact on the diagnostic value of RGU. To the best of our knowledge there is no study that evaluated the impact of instillation of local anesthetic gel on the diagnostic accuracy of RGU. The room temperature at which the anesthetic gel is given and the rate of instillation were reported to affect the degree of discomfort caused by the local anesthetic gel [6–8]. In the study of Thompson et al. [6] and Goel et al. [7], it has been found that instillation of cooled local anesthetic gel at 4°C, produced more discomfort than at 22°C. In addition, Khan and associates [8] found that the slow

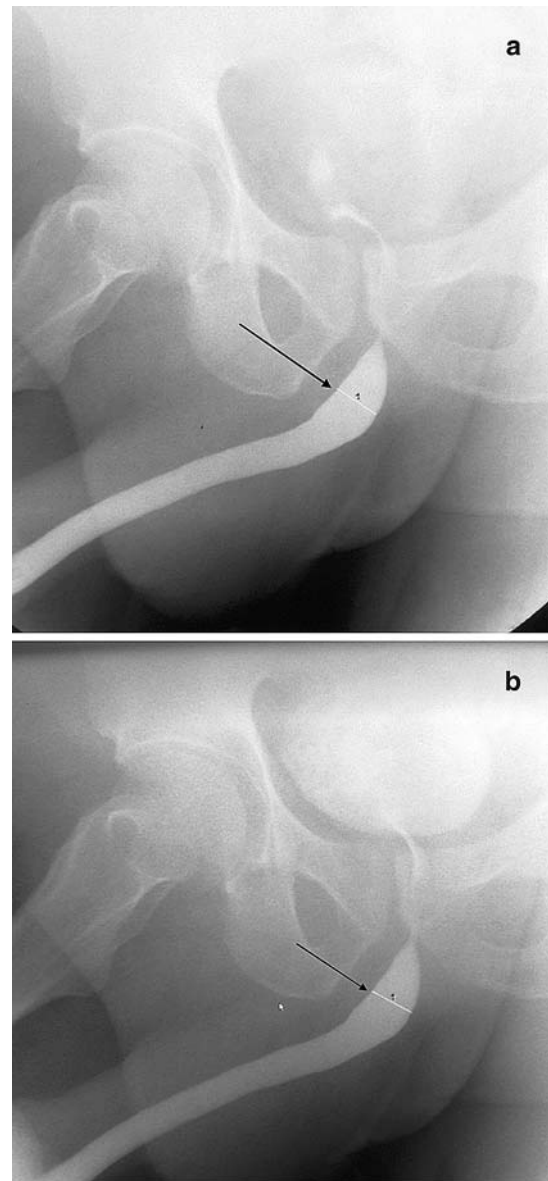


Fig. 2 RGU without local anesthetic agent (**a**) and with local anesthetic agent (**b**) for patient with normal RGU. The arrow refers to the measured diameter of the urethra at middle of bulbous urethra

delivery rate (11 ml of gel over 10 s) was associated with less urethral discomfort than the rapid instillation (11 ml gel over 2 s) [5]. Therefore, we elected to use the slow delivery rate (10 ml over 10 s) at room temperature (22°C).

The effect of local anesthetic gel was expected to be restricted to the mucosa of the urethra. So we found minimal increment in the diameters of

urethra. Although this increment was statistically significant, it was not clinically or radiologically meaningful. In addition, the therapeutic plan was not changed because of this increment.

Conclusion

Instillation of the local anesthetic gel before RGU produces a slight but statistically significant increase in the diameter of the urethra at the selected sites. However, neither the radiologic reading of RGU nor the clinical diagnosis of a possible stricture was changed because of this increment.

References

1. Pode D, Zylber-Katz E, Shapiro A (1992) Intravesical lidocaine: topical anesthesia for bladder mucosal biopsy. *J Urol* 148(3):795–796
2. Holme M, Stewart J, Rice M (2001) Flexible cystoscopy: is the volume and content of the urethral gel critical? *J Endourol* 15(8):855–858
3. Pelit V, Ashurst HN, Biyani CS, Elmasary Y, Puri R, Shah T (2003) Is using lignocaine gel prior to flexible cystoscopy justified? A randomized prospective study. *Urol Int* 71(4):389–392
4. Kobayashi T, Nishizawa K, Ogura K (2003) Is instillation of anesthetic gel necessary in flexible cystoscopic examination? A prospective randomized study. *Urology* 61(1):65–68
5. Chen YT, Hsiao PJ, Wong WY, Wang CC, Yang SS, Hsieh CH (2005) Randomized double-blind comparison of lidocaine gel and plain lubricating gel in relieving pain during flexible cystoscopy. *J Endourol* 19(2):163–166
6. Thompson TJ, Thompson N, Berien O, Young MR, McClean C (1999) To determine whether the temperature of 2% lignocaine gel affects the initial discomfort which may be associated with its instillation into male urethra. *BJU* 84(9):1035–1037
7. Goel R, Aron M (2003) Cooled lignocaine gel: does it reduce urethral discomfort during instillation? *Int Urol Nephrol* 35(3):375–377
8. Khan MA, Beyzade B, Tau W, Viridi JS, Potluri BS (2002) Effect of the rate of delivery lignocaine gel on the patient discomfort perception prior to performing flexible cystoscopy. *Urol Int* 68(3):164–167