SCANDINAVIAN JOURNAL OF UROLOGY
2020, VOL. 54, NO. 4, 277–280
https://doi.org/10.1080/21681805.2020.1776768

ARTICLE

OPEN ACCESS Check for updates

Is bladder tumour fulguration under local anaesthesia more painful than cystoscopy only?

Viveka Ströck[a,b] and Sten Holmäng[c]

[a]Department of Urology, Institute of Clinical Scince, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden; [b]Department of Urology, Region Västra Götaland, Sahlgrenska University Hospital, Gothenburg, Sweden; [c]Department of Urology, Kungsbacka Hospital, Kungsbacka, Sweden

ABSTRACT

Objectives: To prospectively register self-reported pain levels associated with office cystoscopy with or without bladder tumour biopsy and fulguration.

Patients and methods: During a 15-month period, patients examined with cystoscopy under local anaesthesia graded their pain level using the Visual Analogue Scale (VAS). All patients were examined in the lithotomy position and lidocaine gel was used in all. A bladder instillation or a submucosal injection of lidocaine was given mainly in patients treated with extirpation of larger tumours.

Results: The pain perception was graded by the patients as none (VAS = 0) or mild (VAS = 1–3) in 86% of the 1,314 cystoscopies. Fewer patients (65% out of 258) reported VAS 0–3 when cystoscopy with biopsy and fulguration of bladder tumour was performed. More than 97% of all patients stated that they would prefer treatment under local anaesthesia in the case of a future recurrence.

Conclusion: The VAS-scores after diagnostic cystoscopy are in accordance with those previously reported, with the absolute majority reporting no or mild pain. Patients treated with extirpation of bladder tumours reported higher levels of pain but still within acceptable limits. This confirms the potential of treating most patients with small-sized bladder tumour recurrences under local anaesthesia.

ARTICLE HISTORY
Received 29 April 2020
Revised 12 May 2020
Accepted 28 May 2020

KEYWORDS
Bladder tumour; local anaesthesia; VAS-score

Introduction

Cystoscopy is one of the most common procedures in urology. It is the gold standard for detecting pathology in the urinary bladder and for follow-up after bladder tumour treatment. The vast majority of cystoscopies are performed with a flexible or rigid instrument under local anaesthesia.

The absolute majority of suspected bladder tumour recurrences are benign or low-grade non-invasive malignant tumours and are less than 10 mm in diameter [1]. Most such lesions are amenable to treatment under local anaesthesia [2,3]. Still, today most small-sized bladder tumours are treated with the patient under general or spinal anaesthesia in the operating room. One reason may be that many urologists who lack own experience with biopsy and fulguration under local anaesthesia fear that the procedure may be associated with unacceptable pain.

The visual analogue scale (VAS) has been used for comparison of pain and discomfort at flexible and rigid cystoscopy and after laser ablation of bladder tumours [4–7]. The aim of the present study was to evaluate the patients' pain perception using the VAS score at extirpation of bladder tumours, and to compare it with cystoscopy only, since this has not been done previously.

Patients and methods

Our data was collected prospectively, after ethical approval, between 1 January 2010 until 31 March 2011 for patients who were scheduled for cystoscopy at our outpatient clinic, the majority for the indication 'visible haematuria' and bladder cancer follow-up.

Exclusion criteria were any kind of additional intervention such as dilatation of the urethra, insertion or removal of urethral stents, transrectal ultrasound, or lithotripsy. We also excluded patients when both rigid and flexible instruments were used.

The patients had 2% lidocaine gel (Astra Zeneca, Södertälje, Sweden), instilled in the urethra a few minutes before the procedure. Males were given 20 grams and women 10 grams. No oral painkillers or antibiotics were routinely used. The cystoscopy was performed in the lithotomy position. All patients who wished to were able to follow the procedure on a screen. Women were examined with a rigid instrument. Men were examined with either a flexible or a rigid instrument, at the discretion of the urologist. The rigid instruments were Olympus Ch 19.8 (Olympus Europa, Hamburg, Germany) and Storz Ch 19.0 (Karl Storz GmbH, Tuttlingen, Germany) and the flexible cystoscopes were Storz

CONTACT Viveka Ströck viveka.strock@vgregion.se Avdelning för urologi, Bruna Stråket 11B, Sahlgrenska Universitetssjukhuset, Göteborg, 413 45, Sweden

Ch 16.0 and Olympus Ch 16.2. The resectoscope was Olympus Ch 24.

All examinations started with a diagnostic cystoscopy. If a small-sized bladder tumour (less than 10 mm) was seen, the patient was offered immediate removal of the tumour. The intention was always to take cold-cup biopsies of the lesion before destroying it with diathermy. Some patients received additional local anaesthesia at the discretion of the urologist. Instillations of 60 ml 2% lidocaine or submucosal injections of 1–30 ml of lidocaine were more often given when larger lesions were found. The most experienced urologists also operated on medium-sized tumours (10–30 mm), sometimes with a Ch 24 resectoscope. Bladder catheters were as a rule not inserted after the procedure and most patients left the department within 30 min after the operation.

The patients were asked to evaluate pain levels immediately after the examination using VAS and asked an additional question: 'If you have to undergo the same procedure again, would you rather do it the same way or under general anaesthesia?'. We created a database including age, date, sex, anaesthesia, VAS, examinor, instrument, indication, tumour size, number and histopathology. The histopathological grading was done according to the 1999 WHO classification [8].

The project was approved by the Research Ethics Board in Gothenburg (File No. 501-13).

Statistics

For descriptive purposes the number and percentage were given for categorical variables and mean, standard deviation, median, and range for continuous variables.

Since the same patient might appear more than once in the same group and in both biopsy and cystoscopy group, Generalized Estimating Equations (GEE) models were used in comparisons between the two groups adjusting for within-individual correlation. In the analyses of prediction of pain VAS score the same models were used with log-link function and negative binomial distribution, and for the patient experience questions by using Poisson distribution and log-link function with robust error variances [9]. Both unadjusted and adjusted analyses for age and doctor were performed. Descriptively, the estimated values (mean score for pain VAS score and proportion of patients willing to be anaesthetized during next treatment) with 95% Confidence Intervals (CIs) were given per group as well as Risk-Ratios (RR) with 95% CIs and *p*-values between groups.

All performed tests were two-tailed and conducted at the 0.05 significance level. All analyses were performed by using SAS software version 9.4 (Cary, NC).

Results

During the 15-month period, a total number of 1,572 visits were evaluable out of 2,005, thus excluding 433 for the reasons stated above. A final number of 1,314 cystoscopies and 258 biopsy and/or fulgurations were available for analysis. The demographics are shown in Table 1. The number of procedures where a flexible or rigid instrument was used is seen in Tables 1, 3 and 4.

The VAS scores are presented in Tables 2–4. We subdivided the VAS scores into nil (VAS = 0), mild (1–3), moderate (4–6) and severe (7–10). A total of 18/258 patients (7%) in the biopsy group and 37/1,314 (2.8%) in the cystoscopy group reported severe pain. There were no differences between males and females, only between the biopsy versus the cystoscopy group, where the biopsy group scores were 80–90% higher, as shown in Tables 3 and 4. In the biopsy-group, 104/258 (40%) received additional anaesthesia (instillation and/or submucosal lidocaine), but had the same distribution of VAS scores as the remaining 154.

The VAS scores for 18 patients in the biopsy-group, who reported that they would rather do the same procedure under general anaesthesia (7%), varied from 3–10. Some of these patients had had more than one procedure during the study-period, but none of them had answered 'general anaesthesia' twice. In the cystoscopy group where the corresponding figure was 1.2%, VAS varied from 2–10. There were no statistically significant differences between males and females. The only significant difference was between the groups biopsy versus cystoscopy, where the risk ratio for requiring general anaesthesia was 5.72 (2.97–11.03), $p < 0.001$.

In the biopsy-group, eight transurethral resections (TURB) with a Ch 24 resectoscope were performed, in four men and four women, all with additional submucosal injections of lidocaine. The VAS scores ranged from 1–7, with a median of 3. The median size of the tumours was 20 mm (range = 15–30 mm). All except one were new tumours and the histopathological analysis showed one carcinoma *in situ* (Cis), six pTaG1-2 and one pTaG3.

Fulguration of the tumour was done in all cases and the intention was to first take a biopsy for histopathology, but this was not done in 15 of the 258 procedures. In 243 operations biopsies were taken and 143 showed urothelial malignancy, 51 inflammation, 24 were benign, 22 displayed atypia, and three were non-urological malignancies.

Cystoscopies and biopsies were done by 25 urologists and one cystoscopy-trained nurse. Four doctors performed 89% of all the cystoscopies and 90% of the biopsies. There were no significant differences in average VAS scores between the doctors, neither in the biopsy nor cystoscopy cohort (data not shown).

Discussion

The present study has for the first time shown that extirpation of small-sized bladder tumours can be done under local anaesthesia with limited discomfort in the majority of patients as measured with the VAS score. We also registered pain with the VAS score during cystoscopy alone and our findings are in accordance with previous authors' results.

A prerequisite for good results is that instruments and other equipment are readily available and that the urologist and assisting nurse are experienced in performing surgery under local anaesthesia. During the last 25 years, we have

Table 1. Demographics, indications, and instrument.

	Cystoscopy (1,314)	Biopsy (258)	Total (1,572)
Median age (range)	70 (16.2–100.2)	75.3 (24.9–95.1)	70.9 (16.2–100.2)
Men	860 (65%)	171 (66%)	1031
Women	454 (35%)	87 (34%)	541
Flexible instrument	629 (48%)	52 (20%)	681
Rigid instrument	685 (52%)	206 (80%)	891

Table 3. VAS score at cystoscopy.

Numbers (%)					
VAS	0	1–3	4–6	7–10	Totals
Men, flexible	206 (32.8)	355 (56.4)	59 (9.4)	9 (1.4)	629 (100)
Men, rigid	78 (33.8)	116 (50.2)	26 (11.2)	11 (4.7)	231 (100)
Women, rigid	170 (37.4)	209 (46.0)	58 (12.8)	17 (3.7)	454 (100)
Totals	454 (34.5)	680 (51.8)	143 (10.9)	37 (2.8)	1,314 (100)

Table 4. VAS score at biopsy and fulguration.

Numbers (%)					
VAS	0	1–3	4–6	7–10	Totals
Men, flexible	4 (7.7)	31 (59.6)	16 (30.8)	1 (2.0)	52 (100)
Men, rigid	16 (13.6)	65 (54.6)	27 (22.9)	11 (9.3)	119 (100)
Women, rigid	12 (13.8)	40 (46.0)	29 (33.3)	6 (6.9)	87 (100)
Totals	32 (12.5)	136 (52.7)	72 (28.0)	18 (7.0)	258 (100)

Table 2. VAS score and willingness to undergo another tumour fulguration under local anaesthesia.

	Cystoscopy ($n = 1,314$)	Biopsy ($n = 258$)
Median VAS score	1.0	2.0
VAS score 0–3	1,133 (86%)	168 (65%)
VAS score 4–10	181 (14%)	90 (35%)
Patient's preference		
Local anaesthesia	1,297 (99%)	240 (93%)
General anaesthesia	17 (1.2%)	18 (7%)

done between 100 and 300 bladder tumour operations per year under local anaesthesia [10,11]. We believe that our organization and the experience in our team have resulted in increased patient satisfaction. It may be possible that the average patient in less experienced urology units will have more pain, but we found no data suggesting a difference between urologists in our unit (data not shown).

Attempts have been made to reduce pain during cystoscopy. Some studies suggest that lubricants containing lidocaine are better than lubricants only [12,13]. The use of flexible instruments is associated with less pain and discomfort [5,14]. Listening to music during flexible cystoscopy resulted in lower VAS scores [15,16]. Patel et al. [17] reported less pain levels when patients were allowed to watch the video screen, but Cornel et al. [18] found no difference in their study. Preoperative administration of non-steroidal anti-inflammatory drugs resulted in less pain at rigid cystoscopy [19].

An instillation of a local anaesthetic before fulguration was judged to reduce pain [10,11]. A submucosal injection of lidocaine resulted in sufficient analgesia to permit transurethral resection of medium-sized bladder tumours using a resectoscope [20,21]. In the report by Brausi et al. [21], 60% of the patients reported pain scores up to VAS 4, requiring no other analgesia than submucosal injection. The submucosal injection gives in our opinion an excellent analgesia, but some patients feel considerable pain when the needle is inserted and when the liquid is injected. Some men feel discomfort when the rigid instrument is moved in the prostatic urethra. Our study was not designed to study the benefit of a submucosal injection.

The present study has several limitations, the most important was that there was no randomization between groups. Naturally, there was some selection since patients who had considerable pain and discomfort during cystoscopy were not offered immediate fulguration if they had a bladder tumour but returned later for general anaesthesia instead.

Moreover, we could have thought of determination of the VAS score before the cystoscopy since some patients perceive pain and discomfort in the genital tract, and maybe someone else instead of the assisting nurse should have asked the questions. Also, the knowledge of the number of previous cystoscopies was not known in all cases, which would have been interesting to analyse, as Greenstein et al. [4] showed that first-time cystoscopy was the strongest predictor of severe pain. Neither did we register the length of time for each operation, but it seems likely that a shorter time is better tolerated. For this reason, larger tumours should be avoided.

Another limitation in the present study is the additional use of local anaesthesia, as it was given when the urologist thought it appropriate and not only if the tumour had a certain size or when multiple tumours were seen. We should also have used cystoscopes with the same diameter, as this might influence the pain-levels.

One of the strengths of this study is the high number of patients in both the cystoscopy and intervention groups, since earlier reports were, as a rule, much smaller.

Future work must focus on further reduction of pain and discomfort using the methods that have proved to be valuable such as preoperative NSAID administration, generous lubrication, listening to music, and using a flexible instrument when possible. We should also increase the number of patients given lidocaine instillation and submucosal injections. To completely eradicate the discomfort may, however, be difficult as the patients are in an exposed situation at cystoscopy.

Conclusions

It was confirmed that cystoscopy only was associated with no or limited pain in the vast majority of patients even when cystoscopy was performed with a rigid instrument in males. Adding biopsy and fulguration caused a slightly higher grade of pain or discomfort, but was still tolerated well by most patients. All but a few per cent wished again to undergo

treatment under local anaesthesia in the case of a new recurrence. This suggests that much more patients with small-sized bladder tumours could be treated under local anaesthesia.

Acknowledgements

Authors thank Aldina Pivodic, MSc, mathematics, Statistiska Konsultgruppen, for statistical calculations.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

[1] Ströck V, Holmäng S. A prospective study of the size, number and histopathology of new and recurrent bladder tumors. Urol Practice. 2015;2(5):260–264.
[2] Wedderburn AW, Ratan P, Birch BR. A prospective trial of flexible cystodiathermy for recurrent transitional cell carcinoma of the bladder. J Urol. 1999;161(3):812–814.
[3] Sabir EF, Holmäng S. TaG1 bladder cancer: a third of all primary tumors and 80% of all recurrences can be treated in the office using local anesthesia. Urol Practice. 2014;1(4):184–188.
[4] Greenstein A, Greenstein I, Senderovich S, et al. Is diagnostic cystoscopy painful? Analysis of 1,320 consecutive procedures. Int Braz J Urol. 2014;40(4):533–538.
[5] Seklehner S, Remzi M, Fajkovic H, et al. Prospective multi-institutional study analyzing pain perception of flexible and rigid cystoscopy in men. Urology. 2015;85(4):737–741.
[6] Wong KA, Zisengwe G, Athanasiou T, et al. Outpatient laser ablation of non-muscle-invasive bladder cancer: is it safe, tolerable and cost-effective? BJU Int. 2013;112(5):561–567.
[7] Hawker GA, Mian S, Kendzerska T, et al. Measures of adult pain: Visual Analog Scale for Pain (VAS Pain), Numeric Rating Scale for Pain (NRS Pain), McGill Pain Questionnaire (MPQ), Short-Form McGill Pain Questionnaire (SF-MPQ), Chronic Pain Grade Scale (CPGS), Short Form-36 Bodily Pain Scale (SF-36 BPS), and Measure of Intermittent and Constant Osteoarthritis Pain (ICOAP). Arthritis Care Res (Hoboken)). 2011;63(Suppl 11):S240–S52.
[8] Amin MB, Smith SC, Reuter VE, et al. Update for the practicing pathologist: The International Consultation On Urologic Disease-European association of urology consultation on bladder cancer. Mod Pathol. 2015;28(5):612–630.
[9] Zou G. A modified Poisson regression approach to prospective studies with binary data. Am J Epidemiol. 2004;159(7):702–706.
[10] Holmang S, Aldenborg F, Hedelin H. Extirpation and fulguration of multiple superficial bladder tumour recurrences under intravesical lignocaine anaesthesia. Br J Urol. 1994;73(2):177–180.
[11] Holmang S, Aldenborg F, Hedelin H. Multiple bladder biopsies under intravesical lignocaine anaesthesia. Br J Urol. 1994;73(2):160–163.
[12] Aaronson DS, Walsh TJ, Smith JF, et al. Meta-analysis: does lidocaine gel before flexible cystoscopy provide pain relief?. BJU Int. 2009;104(4):506–509.
[13] Goktug HN, Ozturk U, Sener NC, et al. Do lubricants with 2% lidocaine gel have an effect on patient comfort in diagnostic cystoscopy? Adv Clin Exp Med. 2014;23(4):585–587.
[14] Seklehner S, Saratlija-Novakovic Z, Skopek M, et al. Prospective, multi-institutional pain assessment of 150 women undergoing diagnostic cystoscopy. Minerva Urol Nefrol. 2016;68(5):417–423.
[15] Zhang ZS, Wang XL, Xu CL, et al. Music reduces panic: an initial study of listening to preferred music improves male patient discomfort and anxiety during flexible cystoscopy. J Endourol. 2014;28(6):739–744. Epub 2014 Mar 31.
[16] Raheem OA, Mirheydar HS, Lee HJ, et al. Does listening to music during office-based flexible cystoscopy decrease anxiety in patients: a prospective randomized trial. J Endourol. 2015;29(7):791–796.
[17] Patel AR, Jones JS, Angie S, et al. Office based flexible cystoscopy may be less painful for men allowed to view the procedure. J Urol. 2007;177(5):1843–1845.
[18] Cornel EB, Oosterwijk E, Kiemeney LA. The effect on pain experienced by male patients of watching their office-based flexible cystoscopy. BJU Int. 2008;102(10):1445–1446.
[19] Komiya A, Endo T, Kobayashi M, et al. Oral analgesia by non-steroidal anti-inflammatory drug zaltoprofen to manage cystoscopy-related pain: a prospective study. Int J Urol. 2009;16(11):874–880.
[20] Engberg A, Spangberg A, Urnes T. Transurethral resection of bladder tumors under local anesthesia. Urology. 1983;22(4):385–387.
[21] Brausi MA, Verrini G, De Luca G, et al. The use of local anesthesia with N-DO injector (Physion) for transurethral resection (TUR) of bladder tumors and bladder mapping: preliminary results and cost-effectiveness analysis. Eur Urol. 2007;52(5):1407–1411.