

Flexible cystoscopy can improve anxiety and subjective feelings of bladder cancer patients during follow-up

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Abstract

Introduction: The effect of repeated cystoscopy on bladder cancer (BC) patient anxiety and feelings is rarely evaluated.

Aim: To compare the difference of patients' anxiety and subjective feelings caused by different cystoscopes.

Material and methods: We prospectively included 192 BC patients who accepted regular cystoscopy follow-up after transurethral resection of bladder tumor (TURBT): 93 in the flexible group and 99 in the rigid group. The method of anesthesia and the order of examinations were consistent between different groups. We analyzed the anxiety level before cystoscopy, the maximum pain during the examination and the change of lower urinary tract symptoms (LUTS) before and after cystoscopy. Meanwhile, we analyzed the rate of gross hematuria and pyuria after cystoscopy. The anxiety and pain levels were evaluated by the Amsterdam Preoperative Anxiety and Information Scale (APAIS) and visual analogue scale (VAS). LUTS was reflected by the Core Lower Urinary Tract Symptom Score (CLSS). We distinguished gender during analysis.

Results: The median APAIS score of male patients undergoing flexible or rigid cystoscopy was 8 vs. 12 ($p < 0.01$), and this result for females was 8 vs. 9 ($p = 0.048$). The median pain scores for men in the two groups was 1 vs. 2 ($p < 0.01$), respectively, and this outcome in female patients was 0 vs. 1 ($p < 0.01$). Patients in the rigid group had more CLSS change (0 vs. 1, $p < 0.01$). There was no difference in pyuria or gross hematuria rate after examination. Analysis in respective groups showed that men have more severe pain than women, 1 vs. 0 ($p = 0.001$) in the flexible group and 2 vs. 1 ($p = 0.009$) in the rigid group.

Conclusions: A flexible cystoscope can improve anxiety and subjective feelings of BC patients during cystoscopy follow-up.

Key words: bladder cancer, anxiety, lower urinary tract symptoms, non-muscle-invasive bladder cancer, flexible cystoscopy.

Introduction

Bladder cancer (BC) is the most common genitourinary cancer worldwide [1]. Approximately 70–80% of newly diagnosed bladder cancers are classified as non-muscle-invasive bladder cancer (NMIBC) and are usually treated by transurethral resection of bladder tumor (TURBT). NMIBC has a high recurrence rate about 40–80%, so patients will accept regular cystos-

copy over a long period of time. Patients with high-risk tumors will accept cystoscopy at 3 months after TURBT. If negative, subsequent cystoscopy should be repeated every 3 months for a period of 2 years, and every 6 months thereafter until 5 years, and then yearly. Patients with low-risk tumors should undergo cystoscopy according EAU guidelines [2]. As no non-invasive method can replace endoscopy [2], cystoscopy is the most common examination in the urolo-

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Chang-Li Wu, Department of Urology, The Second Hospital of Tianjin Medical University, Pingjiang Road 23, Hexi District, Tianjin 300211, China, e-mail: wucl2003@163.com

gy department. Patients with cancer are more prone to anxiety [3], and the impact of repeated cystoscopy on anxiety in BC patients deserve the attention of clinicians. The flexible cystoscope has a soft body, a smaller diameter, and is more convenient to observe, especially for the bladder neck. Many studies have shown that the two types are equal in detective effectiveness [4, 5]. But so far, the soft cystoscope has not completely replaced rigid ones, which have lower cost, clear vision and convenient performance [6]. Severe pain and discomfort affect the patient's compliance with regular follow-up, and may cause some cystoscopy interruption after TURBT, so it is necessary to pay attention to the patients' feelings during cystoscopy [7]. There has been rare research to observe the effect of different cystoscopes on patients' comprehensive subjective feelings and anxiety status. This study mainly focused on patients' anxiety situation, and analyzed the changes in lower urinary tract symptoms (LUTS), pain scores and the incidence of gross hematuria and pyuria during peri-examinations.

Aim

The aim of study was to compare the difference of patients' anxiety and subjective feelings caused by different cystoscopes.

Material and methods

This was a single-institute study involving 192 NMIBC patients who accepted regular cystoscopy follow-up after TURBT. All patients who might be included needed to fill out the Core Lower Urinary Tract Symptom Score (CLSS) questionnaire, so that we could exclude patients with severe LUTS. Other exclusion criteria included gross hematuria, urinary tract infection and those who accepted biopsy. Patients with pyuria needed to undergo a urine culture to determine the presence of infection. The included patients were randomly divided into a rigid group and a flexible group. In the process of cystoscopy, lidocaine was used first to anesthetize the urethra for 5 min. The order of bladder examination remained consistent between the two groups. The day before the cystoscopy, patients were informed about the type of cystoscope, and then filled out the Amsterdam Preoperative Anxiety and Information Scale (APAIS), which has been proved as a reliable method for assessing preoperative anxiety [8]. Patients were

asked to select the pain level and score immediately according to the visual analogue scale (VAS) after the cystoscopy. They filled in the CLSS questionnaire again and performed another urinalysis the day after the cystoscopy. Data on the incidence of pyuria and CLSS changes were collected. Meanwhile, it was recorded whether gross hematuria still existed 24 h after cystoscopy.

Statistical analysis

Continuous variables were displayed as mean \pm standard deviation or median (interquartile range) based on the outcome of the normal distribution test. Categorical variables were presented as number and percentage. Statistical differences between groups were analyzed by Student's *t* test or the Mann-Whitney *U* test for continuous variables, and the chi-square test and Fisher's exact test for categorical variables. *P*-values under 0.05 indicate statistical significance. All data analyses were conducted using IBM SPSS Statistics (version 21.0; IBM Corp., New York, USA).

Results

One hundred ninety-two patients were included in this study, 93 (48.4%) patients in the flexible cystoscope group and 99 (51.6%) patients in the rigid cystoscope group. There was no difference in the ratio of males to females between the two groups. Demographic and clinical characteristics are shown in Table I.

The main outcomes are shown in Table II. The median APAIS score of male patients undergoing flexible or rigid cystoscopy was 8 vs. 12 ($p < 0.01$), and this result in females was 8 vs. 9 ($p = 0.048$). Similar to the anxiety evaluation, the median pain scores for men in the two groups was 1 vs. 2 ($p < 0.01$), respectively, and this outcome in female patients was 0 vs. 1 ($p < 0.01$). Included male patients had higher CLSS scores than female patients. There was no difference in preoperative CLSS between male and female patients. After cystoscopy, patients who underwent the rigid test had a greater CLSS change (0 vs. 1, $p < 0.01$; 0 vs. 1, $p = 0.001$) and the main changes came from bladder pain and urethral pain. Items that changed in CLSS are shown in Table III. There was no difference in the pyuria rate after examination. Analysis in the respective groups showed that men have more severe pain than wom-

Table I. Demographic and clinical characteristics

Characteristics	Flexible group (n = 93)	Rigid group (n = 99)	P-value
Age	66.2 ±15.0	66.4 ±11.9	0.927
Gender:			0.865
Male	64 (68.8%)	67 (66.7%)	
Female	29 (31.2%)	32 (33.3%)	
Smoking history:			0.248
Yes	62 (66.7%)	58 (58.6%)	
No	31 (33.3%)	41 (41.4%)	
Diabetes:			0.228
Yes	28 (30.1%)	38 (38.4%)	
No	65 (69.9%)	61 (61.6%)	
Hypertension:			0.535
Yes	40 (43.0%)	47 (47.5%)	
No	53 (57.0%)	52 (52.5%)	
Prostate volume [g]	35.4 (29.8, 50.9)	43.9 (30.5, 70.1)	0.074
High grade:			0.726
Yes	39 (41.9%)	44 (44.4%)	
No	54 (58.1%)	55 (55.6%)	

Table II. Main measure outcomes in male and female patients

Gender	Items	Flexible group	Rigid group	P-value
Male	APAIS	8 (6, 12)	12 (8, 15)	< 0.01
	VAS	1 (0, 1.75)	2 (1, 3)	< 0.01
	CLSS	3 (2, 4)	3 (2, 4)	0.397
	CLSS change	0 (0, 0)	1 (0, 2)	< 0.01
	Gross hematuria	1 (0.8%)	5 (3.8%)	0.231
	WBC number per high-power field	7.59 (3.60, 16.18)	15.32 (5.19, 41.16)	0.023
	Pyuria	40 (62.5%)	50 (74.6%)	0.135
Female	APAIS	8 (6.5, 9)	9 (7.25, 12)	0.048
	VAS	0 (0, 1)	1 (1, 2)	< 0.01
	CLSS	2 (1, 2.5)	1 (0.25, 2.0)	0.083
	CLSS change	0 (0, 0)	1 (0, 2)	0.001
	Gross hematuria	0	0	–
	WBC number per high-power field	6.42 (3.70, 13.30)	8.28 (2.62, 19.63)	0.355
	Pyuria	17 (58.6%)	23 (71.9%)	0.277

APAIS – Amsterdam Preoperative Anxiety and Information Scale, VAS – visual analogue scale, CLSS – Core Lower Urinary Tract Symptom Score, WBC – white blood cell.

Table III. CLSS changed items after cystoscopy

Gender	Group	Urethral pain (n)	Bladder pain (n)	Frequent urination (n)	Urgency incontinence (n)
Male	Rigid	40 (53.3%)	27 (36%)	2 (2.67%)	6 (8%)
	Flexible	9 (52.9%)	6 (35.3%)	0	2 (11.8%)
Female	Rigid	20 (42.6%)	27 (57.4%)	0	0
	Flexible	2 (22.2%)	7 (77.8%)	0	0

Table IV. Main measure outcomes in flexible and rigid group

Group	Items	Male	Female	P-value
Flexible	APAIS	8 (6, 12)	6 (6.5, 9)	0.507
	VAS	1 (0, 1.75)	0 (0, 1)	0.001
	CLSS	3 (2, 4)	2 (1, 2.5)	< 0.01
	CLSS change	0 (0, 0)	0 (0, 0)	0.386
	Gross hematuria	1 (1.1%)	0 (0%)	1.000
	WBC number per high-power field	7.59 (3.60, 16.18)	6.42 (3.70, 13.30)	0.245
	Pyuria	40 (43%)	17 (18.3%)	0.722
Rigid	APAIS	12 (8, 15)	9 (7.25, 12)	0.074
	VAS	2 (1, 3)	1 (1, 2)	0.009
	CLSS	3 (2, 4)	1 (0.25, 2)	< 0.01
	CLSS change	1 (0, 2)	1 (0, 2)	0.562
	Gross hematuria	5 (5.1%)	0 (0%)	0.286
	WBC number per high-power field	15.32 (5.19, 41.16)	8.28 (2.62, 19.63)	0.051
	Pyuria	50 (50.5%)	23 (23.2%)	0.771

APAIS – Amsterdam Preoperative Anxiety and Information Scale, VAS – visual analogue scale, CLSS – Core Lower Urinary Tract Symptom Score, WBC – white blood cell.

en, 1 vs. 0 ($p = 0.001$) in the flexible group and 2 vs. 1 ($p = 0.009$) in the rigid group. Included male patients have higher baseline CLSS scores than females. Other analyzed outcomes are shown in Table IV.

Discussion

In this study, we firstly analyzed the different impact of the cystoscope on patients' anxiety in BC patients, especially including female patients. At the same time, we studied several subjective indicators such as pain level, CLSS change and gross hematuria. The pyuria rate after cystoscopy was also studied. Prospective multi-institutional studies and meta-analyses have shown that men

suffered more pain in cystoscopy [9, 10], but few studies have focused on women's feelings, especially when it comes to anxiety during cystoscopy. We found that those patients who underwent rigid examination showed worse anxiety, more severe pain and changes in lower urinary tract symptoms (LUTS). Female patients showed the same tendency as male patients. Although the ratio of males to females with bladder cancer is approximately 4 : 1 [11], the number of female patients is large. Therefore, both genders of BC patients need to be concerned. The pyuria rate in the two groups showed no difference. After the cystoscopy, there will be an increase in urine white blood cells, but it usually

does not mean a real urinary tract infection. The pyuria rate in another study was about 8% [12]; our result may be due to the urinalysis performed less than 24 h after examination. Strict aseptic performance merely caused severe urinary infections.

The Hospital Anxiety and Depression Scale (HADS) score was used to analyze the anxiety of patients undergoing cystoscopy [13]. Compared with the HADS, APAIS places more attention on anesthesia and the examination itself, which can better reflect the subjective feelings of patients [14]. The Chinese version of APAIS has been proved as an effective tool for assessing patients' preoperative anxiety [8]. There is no research focusing on the change of LUTS caused by cystoscopy. Guidelines recommend IPSS (International Prostate Symptoms Score) to assess patients with LUTS. CLSS has a comprehensive assessment, especially suitable for addressing lower abdominal discomfort caused by the cystoscopy [15]. Most patients with bladder cancer are elderly, especially mostly male patients with benign prostate hyperplasia (BPH). Transurethral examination can cause trauma and affect the feeling of LUTS. Our research shows that female patients had lower CLSS scores than male patients and patients' LUTS were less susceptible to flexible cystoscopy. Urethral and bladder pain were major change items in CLSS.

More than 10% of cancer patients suffer from depression [16]. There are two main reasons for the anxiety of cancer patients. On one hand, there are biological psychosocial causes, and on the other hand, it is attributed to the cancer itself and related treatments [17]. Now clinicians pay more and more attention to the physical and mental health of patients with BC. The anxiety, depression and suicide rates are higher in BC patients compared to healthy people [18]. Up to 70% of BC patients have varying degrees of anxiety and depression according to the Vartolomei *et al.* study [19]. Most studies focus on the impact of lifestyle changes after RC, and few studies have focused on patients with NMIBC. Compared with RC, patients with NMIBC have a better quality of life, but they need to be reviewed more frequently. Although NMIBC patients' 5-year overall survival exceeds 90%, the high risk of recurrence and progression is an ongoing burden [20]. Anxiety is difficult to cure clinically. It is more practical to reduce patient anxiety as much as possible during the treatment process. Studies have shown that cystoscopy has a significant impact on the anxiety level of

patients in a week, and elderly female patients are more likely to be anxious [14]. A flexible cystoscope has obvious advantages in this regard.

Anxiety is a complex feeling. During the cystoscopy period, it is affected by pain, fear of recurrence, hematuria, CLSS changes, etc. Poor compliance with regular cystoscopy in NMIBC is associated with even more than double the progression risk [21]. Severe anxiety can lead to interruption of follow-up, so these patients are more likely to suffer a worse prognosis [22]. In fact, few publications study the source of poor adherence and the relationship between compliance and anxiety.

The type of cystoscope can affect anxiety, pain and CLSS during examination. Our research shows that a rigid instrument significantly increases the psychological burden of BC patients and makes their subjective feelings worse. As we all know, BC has a high recurrence rate. Patients need to undergo cystoscopy routinely for several years or even for lifetime. Flexible cystoscopy has become a valuable instrument to detect bladder lesion. It has equal effectiveness in diagnosis or even better when using a special optical source and fluorescent dye [23, 24]. Regrettably, a traditional rigid cystoscope is still the most common way in bladder follow-up so far.

Our study is aimed at anxiety change in patients after TURBT. The impact of anxiety on patients is comprehensive. Although there is no evidence proving that anxiety is a risk factor for the recurrence and progression of BC, the physical and mental impact of invasive examinations should be minimized as much as possible. The cost of flexible cystoscopy is higher, about three times that of hard ones in our center. The inspection fee is one of the obstacles affecting the use of soft lenses. Soft lenses should be used instead of traditional hard lenses as much as possible. Single-center research is the limit in this study. We analyzed subjective items change just during cystoscopy but not throughout all the time of follow-up. The long-term effects of different types of cystoscope on patients' anxiety and further effects on disease recurrence need to be verified. It is necessary to increase clinicians' attention to the mental state of BC patients.

Our research shows that repeated cystoscopy can cause additional anxiety of BC patients. Attention should be paid to the increase in anxiety caused by cystoscopy. Clinicians have not observed this advantage of the flexible cystoscope in this regard. As

the effectiveness of soft cystoscope in diagnosis is reliable, it should be used as much as possible to reduce patients' pain, lower urinary tract symptoms, and most importantly, patient anxiety. This applies to both male and female patients.

Conclusions

Flexible cystoscopy can improve the anxiety and subjective feelings of BC patients during cystoscopy follow-up. Both genders can benefit from flexible examination.

Conflict of interest

The authors declare no conflict of interest.

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