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## CLINICAL INVESTIGATION

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### Diagnostic Value of Flexible Cystoscopy

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#### Abstract

A total of 413 flexible cystourethroscopic procedures were performed on 228 patients. The most common indication was monitoring of patients with a prior urothelial tumor (243 sessions on 81 cases). Other reasons for endoscopy were hematuria (55 sessions), outflow symptoms (44), retrograde pyelography (13), etc. Sixty-six bladder tumors were found in 46 patients. In 22 of these 46 patients, cold cup biopsies were performed through the flexible endoscope. Findings with the flexible system were almost equivalent to those with the rigid endoscope in 39 bladder tumors. All procedures were performed under topical anesthesia or without any anesthesia in the office. No bleeding or urethral injury was seen through the procedures. These results suggested that the technique is safe, reliable and cost-effective.

*Key words* : Flexible cystoscopy, Bladder tumor, Out-flow obstruction, Retrograde pyelography, Cold cup biopsy, Nd: YAG laser

#### Introduction

In Japan evaluation of the lower urinary tract is usually performed with rigid cystourethroscope under topical anesthesia. Flexible fiberoptic endoscopy was introduced initially by Tsuchida and Sugawara<sup>1)</sup> in 1973. However, owing to the reduced optical quality and unfamiliarity with the technique by urologists, this technique has not been widely accepted. As urologists become familiar with the flexible endoscope for removal of upper urinary stones, this technology has been used by several urologists to evaluate the lower urinary tract in the U.S.A. and Europe<sup>2-5)</sup>. We report our experience with the 16Fr and 18Fr fiberoptic endoscope for diagnostic and therapeutic use of bladder lesions.

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Received 1 August 1989 ; accepted in final form 8 December 1989.

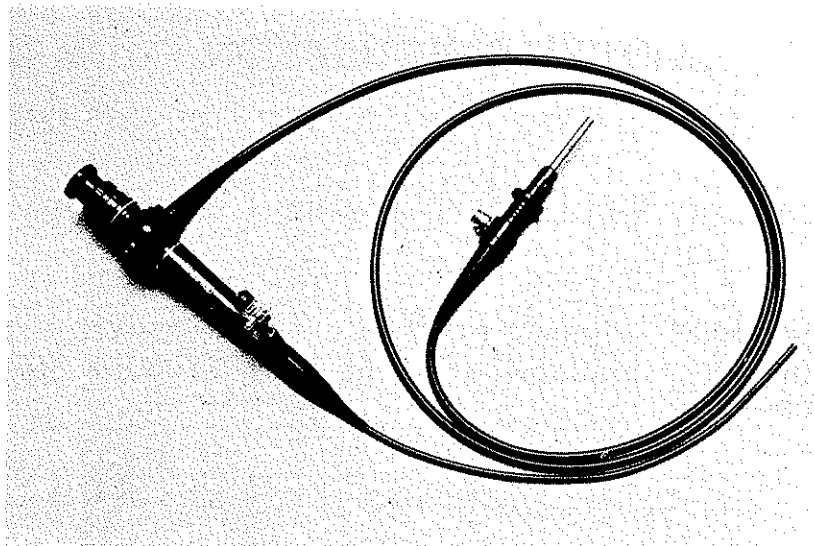


Fig. 1 16 Fr. Olympus flexible cystoscope (CYF).

Table 1 Indications for flexible cystoscopy.

Indications	Sessions (%)	Cases (%)
Evaluation of bladder tumor	236 ( 57)	73 ( 32)
(Laser therapy of tumors	8 ( 2)	— )
Gross hematuria	55 ( 13)	52 ( 23)
Outflow symptoms	44 ( 11)	43 ( 19)
Post-operative follow up of ureter tumor or renal pelvic tumor	17 ( 4)	8 ( 4)
Retrograde pyelography	13 ( 3)	13 ( 6)
Staging of nonurologic malignancies	13 ( 3)	13 ( 6)
Rule out bladder stone	10 ( 2)	6 ( 3)
Urinary tract infection	6 ( 1)	6 ( 3)
Removal of ureteral stent	4 ( 1)	4 ( 2)
Others	15 ( 4)	10 ( 4)
Total	413 (100)	228 (100)

## Patients and Methods

### Instruments

The Olympus 16 Fr flexible cystourethroscope Type CYF (Fig. 1) with 210-degree maximal deflexion and the Olympus 18 Fr fiberoptic choledochonephroscope Type CHF-10 with 130-degree maximal deflexion was used. These instruments can be sterilized by immersion and subsequently cleaned in water.

### Patients

A total of 413 procedures were performed on 228 patients in the supine or dorsal lithotomy position. The study included 219 men and 9 women between 14 and 87 years old (average age 59.6 years). The indications were as shown in Table 1. Topical urethral anesthesia was obtained by lidocaine jelly instillation in about 50 % of the patients. As the injection of jelly into the urethral sometimes caused pain or bleeding, cystoscopic procedures were performed

## FLEXIBLE CYSTOSCOPY

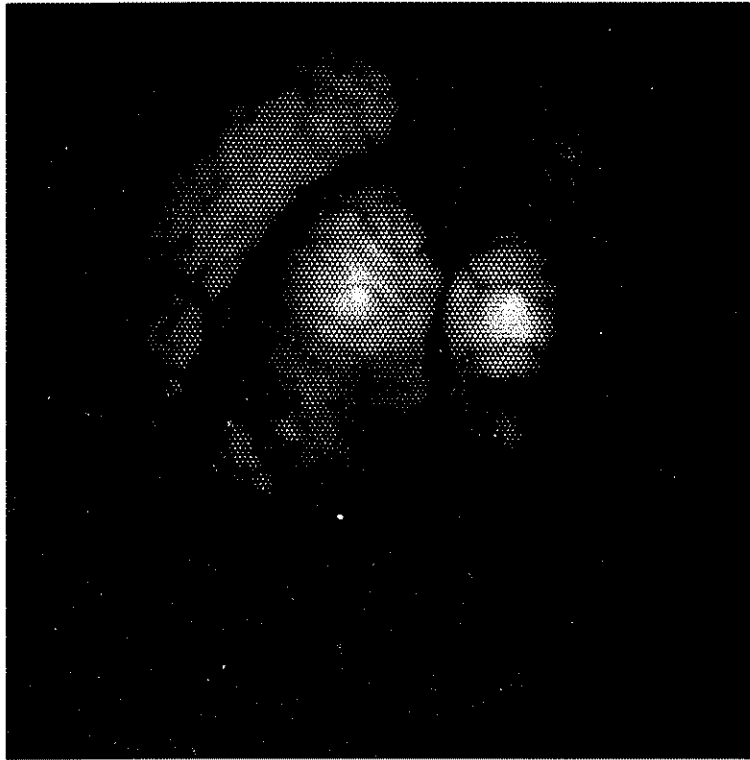


Fig. 2 Prostatic adenoma observed from inside the bladder.

without any anesthesia on the remaining patients. The irrigation fluid was normal saline. A three way adapter was attached to the irrigation unit for suction of residual urine from the bladder or to obtain a sample of bladder washing cytology.

### Laser

Laser therapy for superficial bladder tumors was performed with a Nd:YAG laser and quartz fiber bundle. Laser energy was delivered by contact of the wedge-shaped optic tip to the tumor tissue.

## Results

All procedures were performed with or without anesthesia in the office. The endoscope was easily inserted into the bladder in all patients except in 13 with urethral stricture. In 5 patients in to whom a rigid endoscope could not be inserted due to radiation changes of the urethral or tumor at the bladder neck, the flexible cystoscope was inserted easily under direct vision. No bleeding or urethral injury was seen throughout the procedures.

Findings of the diagnostic procedures are shown in **Table 2**. In 3 patients, severe gross hematuria from the ureteral orifice or bladder tumor interfered with vision and further examination with the rigid endoscope was performed. Tumors at the bladder neck and prostatic adenomas were clearly observed from inside the bladder by deflection of the scope over 180 degrees.

The operative procedures with the flexible endoscope were successful in all but 4 of 53 sessions. Results of the operative procedures are shown in **Table 3**. Enough specimens could not be obtained with cold cup forceps in one case, ureterography could not be performed in two cases and ureteral stent could not be removed in one case.

In 39 patients with bladder tumors, findings with the flexible endoscope were compared with those of further rigid endoscopy at transurethral resection of the tumors. The findings using

**Table 2 Diagnoses made by flexible cystoscopy.**

Diagnoses	Sessions (%)	Cases (%)
Normal	168 ( 41)	78 ( 35)
Bladder tumor	66 ( 16)	46 ( 21)
Benign prostatic hypertrophy	74 ( 18)	42 ( 19)
Urethral stricture	23 ( 6)	16 ( 7)
Renal bleeding	7 ( 2)	7 ( 3)
Bladder stone	7 ( 2)	5 ( 2)
Extension of prostatic cancer into bladder	6 ( 1)	4 ( 2)
Cystitis	6 ( 1)	4 ( 2)
Postoperative scarring from previous partial cystectomy	10 ( 2)	3 ( 1)
Urethral stone	3 ( 1)	3 ( 1)
Diverticulum of bladder	3 ( 1)	3 ( 1)
Others	23 ( 6)	10 ( 5)
Total	396 (100)	221 (100)

**Table 3 Operative procedures with a flexible cystoscope.**

Procedures	Sessions	Cases
Cold cup biopsy	22 (1)*	16 (1)*
Retrograde ureteral cannulation and pyelography	13 (2)*	13 (2)*
Laser therapy of tumors	8	6
Removal of ureteral stent	4 (1)*	4 (1)*
Removal of bladder stone	3	2
Insertion of urethral catheter**	3	3
Total	53	44

\*Number of poor results

\*\*A urethral catheter was placed through a guide-wire inserted with the flexible endoscope in cases of urethral trauma and catheter problems associated with total prostatectomy.

the flexible or rigid instrument were the same in 30 cases. Rigid cystoscopy revealed tumors on the right lateral wall, on the left lateral wall, on the anterior wall or on the trigone respectively which the flexible cystoscope had missed in 5 cases with multiple tumors. In another 3 cases, descriptions of the tumor location were different between flexible and rigid endoscopy. In one case, a small tumor on the anterior wall was not detected with a resectoscope by experienced urologists, nevertheless the lesion had been previously identified with the flexible cystoscope. The tumor was confirmed to be at the same site with the flexible endoscope and resected 2 months later.

### Comment

Advantages and disadvantages of the flexible cystoscopy are described in **Table 4**. As several authors reported<sup>2-6)</sup>, the greatest benefit of the flexible instrument is better tolerance by the patients. It may improve patient compliance with followup examination. The flexible endoscope has been particularly useful among patients unable to undergo rigid endoscopy due

## FLEXIBLE CYSTOSCOPY

**Table 4 Advantages and disadvantages of flexible cystoscopy.**

Advantages	Disadvantages
1. Lenn patients discomfort	1. Narrow visual field
2. Greater safety and lower risk of injury	2. Reduced optical quality
3. Use of supine position	3. Inexperience of surgeon with flexible system
4. Can observe the bladder neck	4. Relative high price
5. Less irrigation fluid	5. Difficulty in cases of severe gross hematuria

to radiation fibrosis of the pelvis, bladder neck tumors, or limited motion of the hip joint. In addition, bedridden and/or critically ill patients are more easily evaluated with flexible rather than rigid cystoscopy<sup>7)</sup>. In this series, 3 patients were evaluated at bedside and one patient in the operating room with minimal preparation.

In a prospective, controlled crossover trial of flexible and rigid endoscopes in the lower urinary tract Clayman and associates found the former at least as good as, or better than the latter in 94 per cent of 80 cases<sup>4)</sup>. In this study, tumor findings in 30 patients with the flexible instrument were the same as those from further rigid endoscopy. In 5 cases multiple bladder tumors were detected by the flexible endoscope, however, further rigid cystoscopy revealed tumors which flexible cystoscopy had missed. On the other hand, a tumor on the anterior wall identified by flexible endoscopy could not be detected by the rigid instrument. These results suggest that the flexible instrument is equally informative in the endoscopic evaluation of the lower urinary tract.

Transurethral procedures available with flexible cystoscopy include ureteral catheterization, cold cup mucosal biopsies, and placement or removal of ureteral stent. The Nd:YAG laser has been used for the treatment of bladder tumor. Low recurrence rate and minimal complications were reported in superficial tumors by Shanberg and associates<sup>8)</sup>. Eight patients were successfully treated with Nd:YAG laser in our office. These results suggest that use of the flexible instrument and Nd:YAG laser will increase the successful number of office procedures employed to treat superficial bladder tumors.

We thank Mrs. Kimiko Nemoto and Mrs. Takako Itoh for their technical assistance.

### References

- 1) Tsuchida, S. and Sugawara, H. : A new flexible fibercystoscope for visualization of the bladder neck. *J.Urol.*, 109 : 830-831, 1973.
- 2) Burchardt, P. : The flexible panendoscope. *J.Urol.*, 127 : 479-481, 1982.
- 3) Fowler, C.G., Badenoch, D.F. and Thakar, D.R. : Practical experience with flexible fiberscope cystoscopy in out-patients. *Brit. J.Urol.*, 56 : 618-621, 1984.
- 4) Clayman, R.V., Reddy, P. and Lange, P.H. : Flexible fiberoptic and rigid lens endoscopy of the lower urinary tract. : A prostective controlled comparison. *J.Urol.*, 131 : 715-716, 1984.
- 5) Soloway, M.S. : Flexible cystourethroscopy : Alternative to rigid instruments for evaluation of lower urinary tract. *Urology*, 25 : 472-474, 1985.
- 6) Snyder, J.A. and Smith, A.D. : Supine flexible cystoscopy. *J.Urol.*, 135 : 251-252, 1986.
- 7) Clayman, R.V. and Kramolowsky, E.V. : Bedside flexible cystoscopy : an approach to the critically ill patient. *J.Urol.*, 135 : 1179-1180, 1986.
- 8) Shanberg, A.M., Baghdassarian, R., Tansey, L. A. : Use of Nd : YAG laser in treatment of bladder cancer. *Urology*, 24 : 26-30, 1987.