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Application of the Ureteroscope for Diagnosis and Treatment of the Seminal Vesicle Diseases

Yalin Song[1], Jianwen Zhao[2], Yao Dong[1]

[1]*Department of Urology, Zaozhuang Municipal Hospital, Zaozhuang, Shandong, China*

[2]*Medical College, Southeast University, Nanjing, Jiangsu, China*

The objective of this paper is to apply the transurethral endoscopic technique with the ureteroscope for diagnosis and treatment of the seminal vesicle and ejaculatory duct disorders. At present there is no special equipment designed to enter directly into the seminal vesicle cavity under direct vision. Sixty patients with disorders of the seminal vesicle were included in this study. A 6.5 F rigid ureteroscope (Richard Wolf GmbH, Knittlingen, Germany) was inserted into the posterior urethra to find the verumontanum. Then a 3F catheter (Shanghai Kangge JJMC, Shanghai, China) was inserted into the verumontanum. After that the 6.5 F ureteroscope was introduced into the ejaculatory duct and seminal vesicle to examine them under direct observation. A total of 55 patients were diagnosed and cured successfully with the ureteroscope; 42 (76.4%) patients were discovered to have hemospermia. They were given an anti-inflammatory and seminal vesicle washing. Eight (14.5%) patients who had small stones in the seminal vesicle were offered the operation of the stones removal. Five (9.1%) patients were found to have seminal vesicle gland cysts. The orifices of ejaculatory duct were not found in 3 patients among 5 who were operated unsuccessfully. The ureteroscope failed to enter the seminal vesicle in 2 patients. Some diseases of the seminal vesicle and ejaculatory duct can be easily diagnosed and treated in the clinical practice using a ureteroscope. Transurethral endoscopy technique with the ureteroscope for diagnosis and therapy of the seminal vesicle and ejaculatory duct disorders is safe and practicable.

Key words: Ureteroscope – Seminal vesicle disease – Application

Currently, seminal vesicle and ejaculatory duct disorders are relatively rare, and diagnosis and treatment of these disorders mainly depends on the patients' symptoms and chief complaints in our clinical practice. Transurethral ultrasonography (TRUS), computed tomography (CT), and magnetic

Corresponding author: Jianwen Zhao, Dingjiaqiao, Gulou District, Medical College, Southeast University, Nanjing, 210000, Jiangsu, China. Tel.: 0086 0632 3252329; Fax: 0086 0632 3252329; E-mail: 15949947748@163.com

resonance imaging (MRI) are the auxiliary diagnostic methods of the seminal vesicle and ejaculatory duct disorders. However, they are not techniques created with a direct vision of the internal anatomy. At present there is no special equipment designed to enter directly into the seminal vesicle cavity under direct vision. In 2002, Yang *et al*[1] applied the conventional endoscopic equipments to examine the interior of the seminal vesicle and concluded that transutricular seminal vesiculoscopy was safe and feasible. In this study, we applied the transurethral endoscopy technique with the ureteroscope for diagnosis and treatment of the seminal vesicle and ejaculatory duct disorders.

Patients and Methods

Patients

From October 2010 to October 2013, the inspections of the seminal vesicles and ejaculatory ducts were conducted with the 6.5 F rigid ureteroscope. Sixty patients with seminal vesicle and ejaculatory duct disorders were enrolled, aged 24–76 years, with a mean age of 48 years. Discovering the hemospermia were the chief complaints in 44 (73.3%) patients. Ten (16.7%) patients felt perineal bulged and discomfort. Six (10%) patients reported pains of the ejaculation (Table 1). The agreements were signed by all the patients.

Instrument

For this paper, a 6.5 F rigid ureteroscope was used, purchased from Richard Wolf GmbH, Germany.

Operation methods

The patients were placed in the bladder lithotomy position after a successful epidural anesthesia. A 6.5 F rigid ureteroscope was gently inserted retrograde into the anterior urethra via the urethral orifice to the verumontanum under direct vision. According to the position of the verumontanum, the orifice of it was observed (Fig. 1). We inserted a 3 F ureteral catheter into the verumontanum via its orifice. Under the guidance of the ureteral catheter, the 6.5 F ureteroscope was mildly conducted into the verumontanum. After examining the verumontanum lacune carefully, we flushed it tenderly and searched the ejaculatory duct opening on its lateral. (Fig. 2). After that, the 6.5 F ureteroscope was introduced into the ejaculatory duct and the seminal vesicle over the ureteral catheter (Fig. 3). Then we examined each part of the seminal vesicle carefully under direct vision. When the obstructions, cysts, or stones were found anywhere, they would be removed or flushed. The fluids of seminal vesicle would be collected for routine tests such as bacterial culture and drug sensitive test when necessary. After the operation, the 6.5 F ureteroscope was gently withdrawn out and a 18 F air sac urinary catheter was left routinely in the bladder for urine drainage for 1 to 3 days to relieve the urine stimulus of the urethra and the seminal tracts.

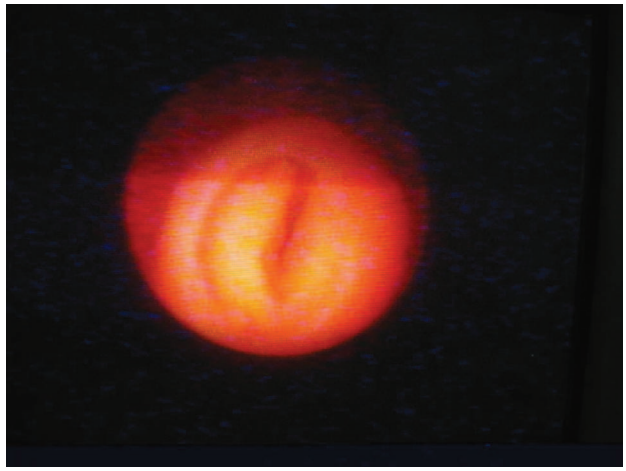

Fig. 1 The image of the orifice of verumontanum.

Results

The examinations and treatments of the seminal vesicle and ejaculatory duct disorders were operated with the 6.5 F rigid ureteroscope in 60 patients, in

Table 1 Patients' data

Age (years)	Number	Hemospermia	Perineal bulge	Ejaculatory pain
24–36	11 (18.3%)	9 (15%)	1 (1.7%)	1 (1.7%)
37–49	15 (25%)	11 (18.3%)	2 (3.3%)	2 (3.3%)
50–62	18 (30%)	12 (20%)	4 (6.7%)	2 (3.3%)
63–76	16 (26.7%)	12 (20%)	3 (5%)	1 (1.7%)
Total	60 (100%)	44 (73.3%)	10 (16.7%)	6 (10%)

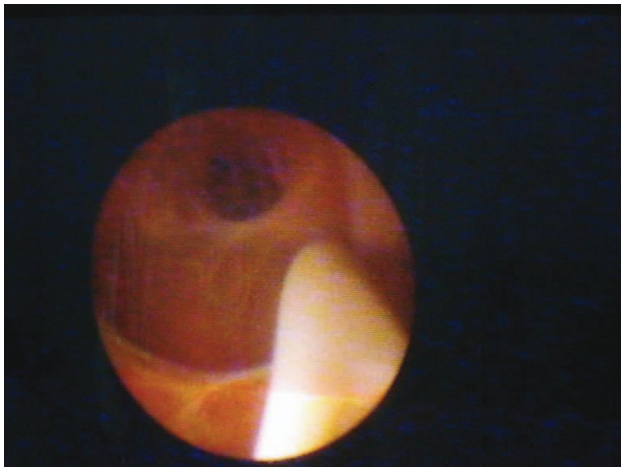

Fig. 2 The image of the orifice of ejaculatory duct (White for the ureteral catheter).

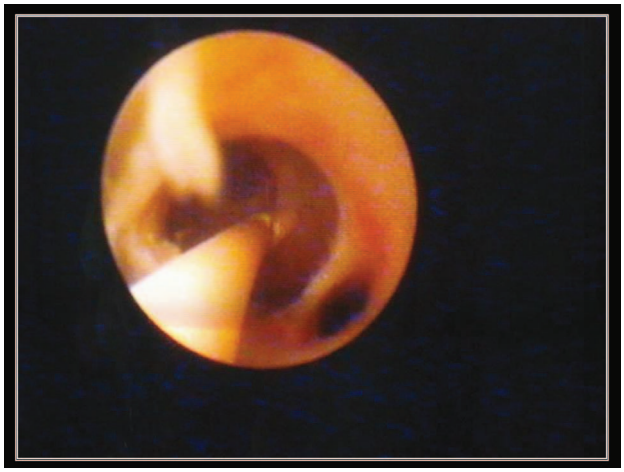

Fig. 3 The image of the seminal vesicle cavity (White for the ureteral catheter).

which 55 cases were performed successfully. Forty-two (76.4%) patients were found to have the hemospermia and given the anti-inflammatory treatment and the seminal vesicle washing. Eight (14.5%) patients who had the calculi in the seminal vesicle were offered the operation of calculi removal. Five (9.1%) patients were discovered to have seminal vesicle gland cysts. After the operations six (10.9%) patients felt the pains of the perineum and posterior urethra. We found that the incidence of the pain was negatively correlated with the age of the patients, that is, the younger the age, the higher incidence of pain (Table 2). The patients over 60 years felt little pain after the operation. Besides pain, there were not any other complications in the present study. All complications were managed conservatively, and recovery was rapid. Five (8.3%) patients were performed unsuccessfully, in which the orifices of the ejaculatory ducts were not found in three cases, and the 6.5 F ureteroscope failed to insert into the seminal vesicle in two cases. No malignancy or hypertrophy was observed.

Discussion

The seminal vesicle is also called glandula vesicle. It is a cystic oblong organ that located behind the fundus of bladder, the lateral side of the deferens ampulla, one on each side. The fluids secreted by the seminal vesicle make up a portion of the semen. The seminal vesicle produces the mucus and fructose and provides the carriers and nutrients for the sperm, which is conducive to the transportation and storage of the sperm. So the seminal vesicle is an important organ with regard to the fertility. But it is difficult to access because of the small lumens and complicated structures and its disorders are rarely reported.

At present the clinical diagnosis and treatment of the seminal vesicle and ejaculatory duct diseases are mainly dependent on the patients' symptoms and chief complaints. The auxiliary diagnostic methods, such as TRUS, CT, and MRI, are all imaging techniques. They cannot observe the lesions directly. So many false-positive or false-negative results were produced unavoidably. Therefore the shortcomings of these techniques in the clinical diagnosis have brought about the attempts to inspect the structures under direct vision. In 1993, Kavoussi *et al*[2] observed the seminal vesicle with a laparoscope. In 1994, Razvi[3] used a semirigid 6.9 F ureteroscope to access and drain a seminal vesicle cyst transurethrally. Okubo *et al*[4] reported a successful endoscopic method to inspect a cutaneous fistula of the seminal vesicle after the rectal amputation using a 6 F semirigid ureteroscope in 1997. The first large-scale research of an endoscopic operation on the seminal vesicle was published in 2002.[1] Transurethral seminal vesiculoscopy (TSV) is a novel technique that uses the ureteroscope to diagnose and cure the patients with the seminal vesicle and ejaculatory duct disorders. TSV can directly visualize subtle changes in the seminal vesicle, ejaculatory duct, and verumontanum, and carry out therapeutic interventions immediately when a lesion is found.[5,6] Many documents have demonstrated that the treatment of the seminal vesicle disorders using the ureteroscope is technically practicable.[3,4,7,8] Xing *et al*[9] reported

Table 2 Examinational results of the successful operations

Age (years)	Successful number	Hemospermia	Calculi	Cyst	Feel pain
24–36	10 (18.2%)	8 (14.5%)	1 (1.8%)	1 (1.8%)	3 (5.4%)
37–49	14 (25.5%)	11 (20%)	2 (3.6%)	1 (1.8%)	2 (3.6%)
50–62	17 (30.9%)	12 (21.8%)	3 (5.4%)	2 (3.6%)	1 (1.8%)
63–76	14 (25.5%)	11 (20%)	2 (3.6%)	1 (1.8%)	0 (0%)
Total	55 (100%)	42 (76.4%)	8 (14.5%)	5 (9.1%)	6 (10.9%)

that the diagnostic yield of TSV was significantly superior to that of TRUS. The endoscopic technique is very helpful not only in observing the anatomic formation of the seminal vesicle and ejaculatory duct, but also in the diagnosis and treatment of their disorders such as prostatodynia, hematospermia, tumors, infertility. It is a minimally invasive therapy of the seminal vesicle and ejaculatory duct diseases. In the studies that have been performed, TSV was well tolerated by the patients and seriously adverse events were not found during and after the operation. Furthermore, as an endoscopic technique, TSV has additional advantages for the diagnosis and therapy of the lesions located in the urethra, seminal vesicle, and bladder. For example, some studies reported that hematospermia might be caused by hemangioma, arteriovenous fistula, or other vascular malformations.[10,11] But these findings were not observed in the current study.

TSV has also some disadvantages , though it has displayed many benefits. For example, because of its invasiveness and the need for anesthesia, it has a potential risk. So it required the manipulators have abundant practice on the ureteroscope and be careful in the operation. Great care must be taken to avoid damage to the prostate or the rectum.

In this study, we applied relatively mature ureteroscopy technique for the diagnosis and treatments of the seminal vesicle and ejaculatory duct disorders under direct vision. This method can increase the accuracy of the diagnosis and improve the treatment of seminal vesicle and ejaculatory duct diseases.

Conclusion

Some diseases of the seminal vesicle and ejaculatory duct can be easily diagnosed and treated in the clinical practice using the ureteroscope. Transurethral endoscopy technique with the ureteroscope for diagnosis and therapy of the seminal vesicle and ejaculatory duct diseases is safe and feasible.

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