Diagnosis and Management of Scrotal Wall Mass with the Aid of Scrotoscope: Case Series Report

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Abstract

Background

Scrotal wall mass is relatively rare in clinical practice, and very difficult to be differentiated from scrotal content lesions by physical or ultrasound examination. Herein, we would like to share the experiences of scrotoscope in diagnosis and treatment of Scrotal wall masses.

Methods

Retrospectively reviewed all the clinical data of scrotal wall mass patients treated by our medical team between June 2015 and July 2019. The diagnostic value was evaluated by comparing with Doppler ultrasound examination and the therapeutic value was evaluated by comparing with traditional surgery. Suspected scrotal tuberculosis or malignant scrotal tumor patients were excluded.

Results

Totally, 6 patients with scrotal wall masses were diagnosed and treated with scrotoscope. Preoperative ultrasound examination led to ambiguous or incorrect diagnosis of the origination of scrotal wall masses in all the 6 cases. The location of all the masses was clearly confirmed by scrotoscope exploration. Three patients were diagnosed as scrotal wall cysts, and 1 of them was successfully resected during the procedure, the other 2 were resected through small incision. In the other 3 patients, a total of 4 scrotal wall solid masses were resected through small incision after diagnosis by scrotoscope. There was no wound infection, scrotal edema, hematoma, chronic scrotal pain or injury of testicular or epididymis.

Conclusions

Scrotal wall masses are relatively rare, and it is very difficult for preoperative ultrasound examination to make a firm diagnosis of its origination. Scrotoscope can confirm the localization of the tumor, and provides us important information for minimally invasive resection. And even in some cases, endoscopic resection of the masses can be performed under scrotoscope.

Introduction

The scrotal wall could be involved in various primary and secondary pathological processes, which might lead to a large variety of lesions¹. In fact, scrotal wall mass is relatively rare in clinical practice, and very difficult to be differentiated from scrotal content lesions by physical or ultrasound examination, which brought us a certain degree of trouble to make an appropriate therapeutic regiment. With the aid of scrotoscope, we could observe and determine the nature of the scrotal mass directly, which could provide us necessary information for proper management²⁻⁵. In some cases, we can resect the scrotal masses directly under scrotoscope^{2,6-8}. This study was conducted to share the experiences of scrotoscope in diagnosis and treatment of Scrotal wall masses.

Methods

Patients

From June 2015 to November 2019, all scrotal mass patients treated by our medical group were retrospectively reviewed. Patients diagnosed as scrotal wall masses with the aid of scrotoscope were selected for further study. Clinical data including age, ultrasound results, scroscopy results, surgery method, surgery time, wound size, complications, pathological results and follow-up time were collected. The diagnostic value was evaluated by comparing with Doppler ultrasound examination and the therapeutic value was evaluated by comparing with traditional surgery. Suspected scrotal tuberculosis or malignant scrotal tumor patients were excluded. Before scrotoscope exploration, Ultrasonography was performed in all patients by two experienced radiologists.

Scroscopy

Scrotoscope exploration was performed using either Fr 17 to Fr 22 Storz (Germany) cystoscope or Fr 26 Olympus (Japan) plasma resectoscope. The patient was placed in a lithotomy position. Sterile saline perfusion was maintained at 60–80-centimeter hydraulic pressure with a low-flow mode continuously. On the anterior wall of scrotum, a 1-cm wide incision was made, until the perididymis was reached. Two Allis tissue clamps were used to fix the entire layer of the scrotal wall along the incision to make sure scrotoscope can be further inserted into the testicular vaginal cavity (Fig. 1,2). The scrotal contents and scrotal wall were carefully inspected with the aid of scrotoscope.

Open surgery

Surgery was performed by at least two experienced scrotoscope surgeons. The incision for scroscopy was placed 1 cm down to the expected location of the scrotal wall mass. If the mass was observable on the inner wall of scrotum during the scrotoscope exploration and was considered benign, we

resected the mass directly with plasma resectoscope. If the mass was unobservable during the scrotoscope exploration, we make another incision right on the expected mass location of the scrotal wall to resect it with open surgery.

Results

Of the 44 scrotal mass cases diagnosed or treated with the aid of scrotoscope by our medical group, only 6 (13.6%) were scrotal wall masses. In these 6 cases, the median age of patients was 46.5 years old, ranged from 25 to 64 years old. Preoperative ultrasound examination led to ambiguous or incorrect diagnosis of the origination of scrotal masses in all the 6 cases. But the scrotal wall origination was all clearly confirmed by scrotoscope exploration. The whole treatment procedure was completed successfully in all the 6 patients with a median operating time of 32 minutes (range, 25–50 minutes). Meanwhile, the median time to diagnostic and resection were 2 minutes (range, 1–4 minutes) and 8 minutes (range, 5–11 minutes) respectively. Three patients were diagnosed as scrotal wall cysts (one multilocular cyst, two solitary cysts), 1 of them was successfully resected during the procedure and the other 2 were resected through small incisions. In patient NO.5, we found two solid-cystic scrotal content lesions located on both epididymides as well as two solid lesions of scrotal wall. The scrotal content lesions were resected under scrotoscope, and the scrotal wall lesions were resected with open surgery. In the other 2 patients, a total of 2 solid masses were resected through small incisions after diagnosed by scrotoscope. There were 9 masses in 6 patients (including 1 patient with 2 scrotal wall masses and 2 scrotal content masses on both the left and right sides of the scrotum), 13 scrotal incisions, with a median size of 1 cm (range from 0.8 to 2.5 cm). Of which, there are 7 incisions built for diagnosis with a basic same size of 1 cm and 6 incisions built for resection with a median size of 1.5 cm (range from 0.8 to 2.5 cm). There was no scrotal edema, wound infection, hematoma, chronic scrotal pain, testicular injury or epididymis injury. Postoperative pathological results: there were 1 case of angiomyxoma, 1 case of Leiomyoma, 1 case of adenomatoid tumor and 3 cases of cyst. The length of hospitalization was 3 days for all 6 patients. No tumor recurrence was observed after a median follow-up period of 21 months (ranging from 6 to 24 months). (Table 1) (Fig. 2).

Table 1
Comparison of ultrasound and scrotoscopy results in scrotal wall lesions.

Case	Age (y.)	Onset time (mo.)	Side	Ultrasound		Scrotoscopy					Pathology
				Nature	Size (cm)	Position	Relationship with testis epididymis and spermatic cord	Role	Position	Position consistent with ultrasound or not	
1	25	18	Left	heterogeneous echogenic mass	4.2	Inside the right scrotum	Above the head of left epididymis	Diagnosis	Scrotal wall (outside of TVC and visible under scrotoscopy)	Not	Angiomyxoma
2	34	24	Right	Multilocular cystic lesion	2.6	Inside the right scrotum	Posterior of testis	Treatment	Scrotal wall (outside of TVC and visible under scrotoscopy)	Not	Cyst
3	59	24	Right	Cystic mass	3.1	Inside the scrotum	Next to the testis	Diagnosis	Scrotal wall (outside of TVC but Invisible under scrotoscopy)	Not	Cyst
4	26	12	Left	Solid mass	1.2	Inside the scrotum	In the tail of epididymis	Diagnosis	Scrotal wall (outside of TVC but Invisible under scrotoscopy)	Not	Adenomatoid tumor
5	64	24	Both	Two solid-cystic lesions as well as two solid lesions	0.4 and 2.0 (left), 0.6 and 0.8 (right)	Four masses inside the scrotums	Located in the both epididymides	Diagnosis and treatment	Scrotal wall (two masses located in the both epididymides, but the other two masses outside of TVC and Invisible under scrotoscopy)	Partially consistent	Leiomyoma in both sides of scrotums, Chronic epididymitis with cystic changes in both sides of epididymides
6	62	6	Right	Cystic mass	1.9	Inside the scrotum	Originated from spermatic cord	Diagnosis	Scrotal wall (outside of TVC but Invisible under scrotoscopy)	Not	Cyst
TVC = testicular vaginal cavity											

Discussion

Intrascrotal mass is a common finding in the male population. Most of them originated from the scrotal contents, such as the testicles and epididymis. While scrotal wall mass is relatively rare⁹. Unlike scrotal content masses, which are 90% malignant, scrotal wall masses are more likely benign.

Ultrasonography is the most common diagnostic test for intrascrotal masses, which has a moderately good diagnostic value to its nature, but relatively low diagnostic value to its exact location^{1,10}. As showed by our study, ultrasonography precisely diagnosed the cyst nature of 3(50%) scrotal wall masses and roughly describe the benign appearance of the other 3 scrotal wall masses. As for the mass position, ultrasonography failed to make a reliable description in all the 6 cases, which brought us a certain amount of trouble in the further therapeutic regimen making. Diagnosis of the origination is challenging because of the complicated anatomic structure within the scrotum. In fact, successfully distinguishing scrotal wall mass and scrotal content mass, instead of precisely describing its position, will be enough to help us make a proper therapeutic regimen. Herein, we introduce a new minimally invasive method, which is called scrotoscope, to help us distinguish scrotal wall masses from scrotal content masses.

Scrotoscope is a kind of endoscope which can be performed in the scrotum^{2,5,11}. With the aid of scrotoscope, we can explore and observe the structures within the scrotum, such as testis, epididymis and the scrotal wall. During the procedure, we can make firm diagnosis and perform proper treatment to the intrascrotal lesions. Scrotoscope was firstly reported by Shafik to explore the scrotal content in 1986 worldwide¹². In China, scrotoscope was first reported by our group to diagnose intrascrotal lesions in 1992. In this research, our group firstly conduct a study to introduce the experiences of scrotoscope in the diagnosis and treatment of scrotal wall masses.

As demonstrated by our study, scrotoscope has a moderately good diagnostic value to the nature of only a small part of scrotal wall masses. But it can firmly confirm the position of most scrotal wall masses. Therefore, while the benign nature has been roughly determined by ultrasound examination, scrotoscope examination can be used as a necessary supplement to further clarify the origination of intrascrotal masses and provide sufficient basis to make a proper surgery plan. In some cases, scrotoscope can be used as a therapeutic procedure. In our study, the scrotal inner wall cyst of patients NO.2 could be observed with the aid of scrotoscope and the cyst was directly resected under scrotoscope. After 24-month's follow-up, no recurrence was observed in this patient. In other 5 cases, the scrotal wall masses were resected by open surgery with small incision, after the scrotal wall origination had been confirmed by scrotoscope exploration. After 6 to 24 months' follow-up, no recurrence or metastasis were observed in all these patients.

In terms of safety, edema and hematoma of scrotum, incision infection, injury of spermatic cord, torsion of testis, chronic scrotal pain and orchiatrophy were common complications after scrotoscope exploration^{13,14}. But, none of these complications was observed in all the 6 patients of our study during a median follow-up of 21 months. Scrotal edema is the most common complication after scrotoscope exploration by inexperienced scrotoscope surgeons. For patients with scrotal edema after scrotoscope exploration, the main cause is the damage of perididymis or infiltration of perfusion fluid through the incision into the interlayer of the scrotal wall³. Therefore, the total layer of scrotal wall incision should be completely clamped with Allis tissue forceps during the procedure. Meanwhile, attention should be paid to control the perfusion fluid pressure. According to our experience, it should be maintained as 60-80-centimeter hydraulic pressure. Once scrotal edema occurs, the operating time should be reduced as possible as you can to effectively reduce the severity of edema. Even if scrotal edema occurred eventually, most of them were expected to go down within 24 to 48 hours, if properly pressurized.

Conclusion

In recent years, scroscopy had been widely used in the diagnosis and treatment of variety scrotum diseases, such as scrotal content masses and testicular torsion. But as far as we know, this is the first study conducted to evaluate the diagnostic and therapeutic value of scroscopy in scrotal wall masses. As showed by our study, scroscopy was a safe and effective technique in the diagnosis and treatment of scrotal wall masses. It could be used as an important supplement of Ultrasonography and open surgery in scrotal wall mass's diagnosis and treatment respectively. But, owing to the retrospective design and small sample size of our study, more well-designed clinical trials will be warranted to determine its value.

Declarations

Author's contribution

RZ prepared the draft of manuscript. YG and TL collected the data. QZ and LY participated in the cases diagnosis and management and follow-up. JY and YW sponsored the study and took part in the paper editing. All authors read and approved the final manuscript.

Ethics Statement.

The approval for this study was obtained from the Fujian Provincial Hospital. Written informed consents were obtained from the guardians of these patients. Identifying information was removed from the study. All data were kept by only the administrator of the study in a confidential manner and was not used by any other purposes. The methods were performed in accordance with the relevant guidelines and regulations.

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Competing interests

None declared.

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Figures

Figure 1

Procedure of scrotoscope. (A) Two Allis clamps secured at the edge of the scrotal incision to avoid perfusion fluid leakage through the incision into the interlayer of the scrotal wall. (B) Scrotoscope was inserted into the testicular vaginal cavity.

Figure 2

Clinical features of patients with scrotal wall mass. (A) Ultrasound image of case no. 6 indicates a 1.9cm cyst located in inside the scrotum and may be originated from spermatic cord. (B) We further performed enhanced computed tomography for this patient and it says the cyst located in posterior of right testicle. (C) Postoperative incision of case no. 5 shows four two incisions were made on the both sides of scrotum and no scrotal edema happens after surgery.