Evaluation of Frozen Section Results in Patients Who Have Suspected Testicular Masses: A Preliminary Report

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Purpose: To report our experience with patients who have suspected testicular masses (STM) managed by ex vivo technique of testicular sparing surgery (TSS) after radical orchiectomy.

Materials and Methods: Between 2007-2011 years, 10 patients with STM were evaluated by history, physical examination, testicular ultrasound and serum tumor markers. STM were defined as; no paratesticular lesions, size of the lesion smaller than 20 mm, and no known presence of elevated tumor markers or metastatic disease. The principles of TSS followed by radical orchiectomy were applied to the removed surgical specimen. Excised mass, multiple biopsies of the adjacent parenchyma and the remaining testis were sent for frozen-section analysis (FSA). Histopathologic sections were re-reviewed for definitive pathologic diagnosis.

Results: The mean patient age, mean size and mean length of history of STM were 37 years (25-64), 17.5 mm (10-20) and 6 months (2-12). All STM were palpable and painless. Tumor markers were negative in all patients. Six tumors were benign (2 adenomatoid tumor, 1 epididymitis nodosa, 1 leydig cell tumor, 1 sertoli cell tumor, 1 fibrous pseudotumor) and 4 tumors were malignant (3 seminoma, 1 embryonal carcinoma) on definitive pathologic diagnosis. Excluding one benign lesion, FSA correctly determined 9 lesions and all malignant lesions. Three patients had testicular intraepithelial neoplasia (ones seminoma, ones embryonal carcinoma, ones adenomatoid tumor).

Conclusion: Our preliminary report reveals that STM tend to be benign rather than malignant in nature. Also, a careful patient selection and an accurate FSA are crucial points for TSS and it has the potential to become the primary option in selected patients who have testicular lesions instead of the traditional method.

Keywords: organ sparing treatments; prognosis; testicular neoplasms; testis; pathology; surgery; frozen sections; humans.

INTRODUCTION

Recently, the extensive use of scrotal ultrasound (US) for diagnosis of various disorders led to more frequently detection of suspected testicular masses (STM) due to the several reasons. First, it sometimes can be difficult to distinguish benign intratesticular lesions from malignant lesions because of the specificity of imaging findings of US may decrease.[1] Second, some patient features such as no palpable lesions on examination of testicles, no elevated serum tumor markers, no testicular lesions with a large diameter, no testicular microlithiasis on US exam, no history of cryptorchidism and no past operation history for testicular cancer are also factors to contribute to inconclusive US results.[2,3,4]

On the other hand, radical orchiectomy traditionally has been performed for definitive treatment in the presence of a normal contralateral testicle as 90%-95% of primer testicular masses are malignant germ cell tumors.[5,6] In recent clinical studies, it has been reported that the probability of malignancy of STM can be lower than expected, and unnecessary orchiectomies can be prevented by testis-sparing surgery (TSS) using guided Frozen-Section Analysis (FSA) in selected patients with testicular masses.[7,8,9] Despite these exciting reports, clinical problems remain on whether to perform TSS in patients with STM for following reasons. First, the safety of TSS is completely based on the findings of FSA, if surgical principles are respected. Therefore, misdiagnosis of a malignancy can result in serious problems on the oncologic outcomes. Second, the data of patients with STM is relatively few in the literature as these cases are rarely encountered in urological practice. Last, it has been stated by the management guidelines on testicular cancer that TSS is not absolutely indicated in patients with STM.[10] For features mentioned above, initially, the surgeons should carefully determine STM cases, and also should be aware of their capability of internal pathological assessment before starting to perform TSS. In this preliminary report, we aimed to present the first outcomes in our STM cases that were applied TSS with ex vivo approach following radical orchiectomy.

MATERIAL AND METHODS

Between 2007-2011 years, 10 patients with STM were evaluated by history, physical examination, testicular ultrasound and serum tumor markers, preoperatively. STM were confirmed by two radiologists. Patients with STM were defined as; no paratesticular lesions, size of the lesion smaller than 20 mm, normal tumor markers and no presence of known metastatic disease. Radical orchiectomy was performed and then, the principles of TSS were applied to surgical specimen as in vitro. Excised mass, multiple biopsies of the adjacent parenchyma and the remaining testis were sent for FSA like performing a routine TSS. Histopathologic sections were re-reviewed to confirm the results of FSA.

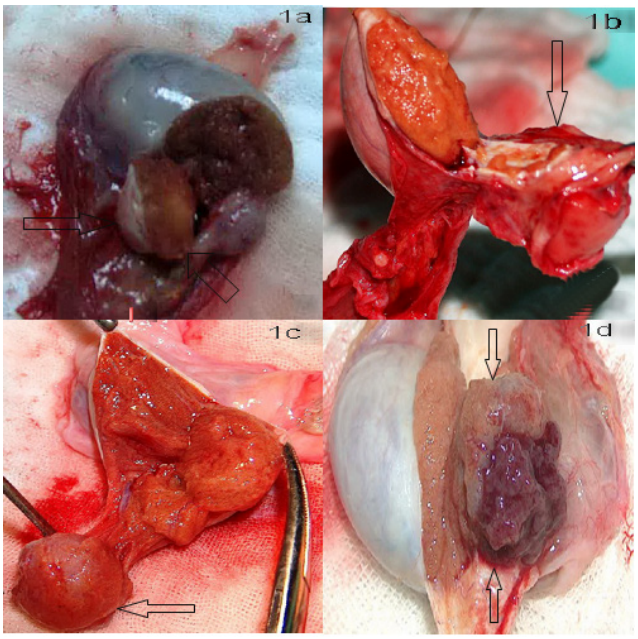

Figure 1. The macroscopic appearance of excised masses. A) adenomatoid tumor, B) epididymitis nodosa, C) seminoma, D) embryonal carcinoma.

RESULTS

The mean patient age was 37 years ,range (25-64), the mean mass size was 17.5 mm ,range (10-20) and the mean suspected history 6 months ,range (2-12). All of the testicular masses were palpable and painless. Preoperatively, serum tumor markers were negative in all patients. All of the patients with STM were consulted by two radiologists. All patients were undergone radical orchiectomy and then, the principles of TSS were applied to the removed testicle and obtained specimen was sent to FSA (Figure). A benign testicular tumor was found in 6 (2 adenomatoid tumor, 1 epididymitis nodosa,

Table . Characteristics of study subjects.

Patients	Testicular ultrasonography	Excised mass	Multiple biopsies	Remaining testis	Definitive pathology
No. 1	Upper-pole, 15 × 10 mm hypoechoic solid	Adenomatoid tumor	No tumor present	No tumor present	Adenomatoid tumor
No. 2	Middle-pole, 18 × 11 mm hypoechoic solid	Embryonal carcinoma	No tumor present	No tumor present	Embryonal carcinoma
No. 3	Upper-pole, 16 × 16 mm hypoechoic solid	Sex cord stromal tumor	No tumor present	No tumor present	Adenomatoid tumor
No. 4	Upper-pole, 20 × 16 mm hyperechoic solid	Epididymitis Nodosa	No tumor present	No tumor present	Epididymitis nodosa
No. 5	Lower-middle-pole, 20 × 20 mm hypoechoic solid	Seminoma	No tumor present	No tumor present	Seminoma
No. 6	Lower-middle-pole, 20 × 15 mm hypoechoic solid	Sex cord stromal tumor	No tumor present	No tumor present	Leydig cell tumor
No. 7	Middle-pole, 15 × 15 mm hyperechoic solid	Sex cord stromal tumor	No tumor present	No tumor present	Sertoli cell tumor
No. 8	Upper-pole, 16 × 16 mm hyperechoic solid	Fibrous pseudotumor	No tumor present	No tumor present	Fibrous pseudotumor
No. 9	Middle-pole, 17 × 10 mm hypoechoic solid	Seminoma	No tumor present	No tumor present	Seminoma
No. 10	Middle pole, 18 × 16 mm hypoechoic solid	Seminoma	No tumor present	No tumor present	Seminoma

1 leydig cell tumor, 1 sertoli cell tumor, 1 fibrous pseudotumor) and a malignant tumor in 4 (3 seminoma, 1 embryonal carcinoma) of the 10 patients on definitive pathology. Comparing the results of FSA and definitive pathology, excluding one benign lesion, FSA correctly determined 9 lesions and all of the malignant lesions. The results of ultrasound, FSA and definitive pathology of patients were shown in Table.

DISCUSSION

The results of our study have shown that STM could be benign at a rate of 60% and radical orchiectomy could be avoided by the TSS in these patients. We also noticed that our internal pathologic assessment has a high capability to predict pathological outcomes which FSA results are correlated with definitive pathologic outcomes in malignant lesions and nearly all benign lesions. The promising findings of our preliminary study have inspired us to take a step ahead to perform TSS from radical orchiectomy.

The long established knowledge states the radical orchiectomy as the definitive treatment for all patients with intratesticular masses.[5,6] But radical orchiectomy for any STM could be overtreatment as an unexpected ratio of benign tumors has been encountered.[2] Recently, TSS is gradually gaining popularity in preventing unnecessary orchiectomies

for patients with STM.[11-14] In these reports, it has been emphasized that STM can be of benign nature in a considerable number of patients and TSS can be a better approach than radical orchiectomy. But, clinical trials have provided no strong evidence for the efficacy of TSS in patients with STM as only very few clinical studies have been published. Also, the validity of TSS has still been obscured in the management guideline especially in patients with contralateral "normal" testicle.[10] In the presented report, benign natures of testicular lesions were established by definitive pathology in 6 of 10 patients with STM. Because the limited number of patients included in the study and the surgical technique of TSS has been carried out as ex vivo approach, it is difficult to suggest TSS as the primary treatment choice for all patients with STM. But it has revealed that a curative treatment for 60% of our patients can be established.

Defining the enrollment criteria has been one of the cornerstones for TSS candidates with STM. It has been reported that the probability of benign testicular lesions can be increased if the patients have negative tumor markers or/and have a small diameter of lesions especially.[7,8] In fact, Passarella and colleagues reported that the incidence of benign nature of testicular lesions has increased up to 81% in selected cases.[9] The study consisted of patients who had small, palpable testicular lesions and negative serum tumor markers. Moreover, non-palpable testicular masses -incidentally detected by ultrasound- in patients with negative tumor markers and small lesions can be reported as better candidates for TSS.[15-17] In those studies, the rates of benign testicular lesions were about 60–100%. For our selection criteria, -all patients have had no paratesticular lesions, size of the lesion smaller than 20 mm, normal tumor markers and no presence of known metastatic disease- the rates of benign testicular lesions were 60%.

Another critical point of TSS is FSA and it has a crucial importance on decision during the operation whether to keep on with TSS or not. Therefore, an effective communication between surgeons and pathologists is essential to obtain more accurate results and to minimize the number of misdiagnosis. Fortunately, both specificity and sensitivity of FSA on predicting the definitive diagnosis in STM patients is almost 100%, if the surgical principles were respected [4,18]. Our report revealed a relatively high concordance between the frozen-section findings and the definitive histologic results.

CONCLUSION

Our preliminary report reveals that STM tend to be benign rather than malignant in nature. The selection of patients with STM, the correct application of surgical principles of sparing surgery and the results of FSA are the important aspects for TSS. Also, the surgeons should be aware of the capability of own's pathology unit before the beginning to perform TSS. We think that TSS may be a potential treatment option for patients with STM in our center instead of radical orchiectomy in the future.

CONFLICT OF INTEREST

None declared.

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