Management of Nonpalpable Incidental Testicular Masses: Experience with 10 Cases

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Purpose: To determine the proportion of benign and malignant testicular lesions among patients with nonpalpable incidental testicular masses.

Materials and Methods: Ten patients with nonpalpable incidental testicular masses underwent surgical exploration. Surgery was performed via an inguinal approach with temporary cord occlusion and frozen section examination (FSE) of the lesions. Benign findings allowed for testicular sparing surgery (TSS), whereas cancer prompted total orchiectomy.

Results: The lesions measured 6-19 mm in the largest diameter. Four of the 10 lesions were benign (40%) and TSS was accomplished in these cases. Complete concordance was observed between the results of FSE and permanent histopathology examination. Of the six patients with cancer, four had pure seminoma and two were mixed germ cell tumor. Surveillance was applied in four of these patients, radiotherapy was used in one patient with seminoma and retroperitoneal lymph node dissection was done in one patient with mixed germ cell tumor. With an average follow-up duration of 24 months, all patients were alive and free of disease. All four patients in whom TSS was accomplished had an uneventful postoperative course, and after an average follow-up duration of 20 months, all had normal results in scrotal physical examination and ultrasound.

Conclusion: Malignant lesion always should be considered in nonpalpable incidental testicular masses and surgical exploration is mandatory. TSS is safe and effective in patients with small benign lesions. Cancer is reliably detected by FSE.

Keywords: testicular neoplasms; pathology; surgery; treatment outcome; urologic surgical procedures; palpation; prognosis.

INTRODUCTION

The incidence of testis cancer is increasing with an incidence of approximately 3-10 new cases per 100,000 males per year in western countries.[1,2] About 90-95% of testicular tumors are malignant germ cell tumor and remaining of them are benign lesions or metastasis from other organs. Most of these tumors are palpable and 95% of all palpable tumors are malignant.[1] With the general use of scrotal ultrasound in the evaluation of urologic problem such as infertility, scrotal pain or trauma, the incidentally detected nonpalpable testicular mass is increasing and most of these lesions are hypoechoic.[3-5] Imaging study such as ultrasound or magnetic resonance imaging (MRI) have high sensitivity in detection of these lesions but specificity is low and differentiation of benign from malignant lesions are impossible by these modalities.[4-6] So these finding are clinical dilemma and unlike the management of palpable testicular mass which is straightforward and radical orchiectomy remains the standard of care in these situation, treatment of incidentally impalpable testicular mass is controversial and is not well established.[1] Impalpable testicular lesions have been studied in some case series and results of these studies were different and most of patients had benign lesion but some malignant lesion have also been reported and still there is controversy in management of these patients.[7-11] We here report a series of cases of incidentally impalpable testicular mass identified by ultrasound.

MATERIALS AND METHODS

Between April 2009 and May 2011 ten patients with nonpalpable testicular masses discovered by ultrasound were studied. Patients underwent urological examination for reasons other than suspected testicular tumor. The indications for scrotal ultrasound were infertility evaluation in 4, orchalgia in 3 and scrotal trauma in 3 patients. Ultrasonography was performed using a high-frequency linear-array transducer (8-13 MHz) and the testes were examined in at least two planes in the long and transverse axes. All patients had complete preoperative staging procedure, including abdominal computed tomography (CT) scan, chest X-ray and tumor markers measurements including α fetoprotein, β human chorionic gonadotropin (hCG) and lactate dehydrogenase.

All patients underwent exploration with excision of the testicular mass using the inguinal approach without in-

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Table 1. The patients' characteristics and final pathology diagnosis.

No.	Age at Surgery (years)	Follow-up (months)	Reason for US	Tumor Diameter (mm)	Final Pathology
1	32	21	Infertility	6	Seminoma
2	26	23	Orchalgia	12	Leydig cell tumor
3	32	14	Orchalgia	13	Seminoma
4	34	21	Infertility	9	Leiomyoma
5	41	36	Scrotal trauma	7	Seminoma
6	54	25	Scrotal trauma	10	Mixed GCT
7	35	20	Infertility	5	Endodermal sinus tumor
8	23	22	Orchalgia	19	Mixed GCT
9	24	26	Scrotal trauma	11	Seminoma
10	21	16	Infertility	14	Epidermoid cyst

Abbreviations: US, ultrasonography; GCT, germ cell tumor.

traoperative ultrasound. After inguinal exploration of the testis, ice slush solution was placed around the testis, and the spermatic cord vessels were occluded with a tourniquet. The tunica albuginea was incised in the relatively avascular region. The tumor was identified and excised leaving 2 to 3 mm borders of normal-appearing tissue around the mass. The lesion was sent for frozen section examination (FSE) immediately. If a malignant germ cell tumor was found in the presence of a normal contralateral testis, radical orchiectomy was performed but if result of FSE was benign organ-sparing surgery was done.

RESULTS

The patients' characteristics are shown in **Table 1**. The mean age at the time of diagnosis was 32.2 (range, 21-54) years. The mean tumor diameter was 10.6 (range, 6-19) mm and contralateral testicle was normal in all cases. Tumor markers were within normal limits and abdominal CT scan and chest X-ray were unremarkable in all cases. All lesions were hypoechoic, and exploratory surgery with FSE was performed for all of them. Overall, the final histopathology examination revealed six (60%) malignant and four (40%) benign lesions. The diagnosis in malignant lesions include seminoma in four (40%) and mixed germ cell tumor in two patients (**Figure 1**). The benign lesions were Leydig cell tumor (n = 1), endodermal sinus tumor (n = 1), leiomyoma (n = 1) and intratesticular epidermoid cyst (n = 1) (**Figure 2**). In four cases with benign lesions the testis sparing surgery was done, and negative margins were confirmed by biopsy. In five patients with malignant lesions detected on FSE, radical orchiectomy was performed in the same procedure. Result of one FSE during operation revealed no evidence of malignancy and testis was preserved, but the final histological examination revealed seminoma. Base of permanent pathology report radical orchiectomy was done subsequently.

Surveillance was applied in four of patients with malignant lesions, radiotherapy was used in one patient with seminoma and retroperitoneal lymph node dissection was done in one patient with mixed germ cell tumor. With an

Table 2. Published series and hypoechoic nonpalpable testicular lesions.

Authors	Year	No. of Patients	Size (range mm)	No. Benign Lesions	No. Malignant Lesions
Buckspan et al[14]	1989	4	3-6	4	0
Corrie et al[15]	1991	4	9-27	4	0
Horstman et al[16]	1994	9	3-15	7	2
Comiter et al[11]	1995	15	4-32	4	11
Pierik et al[17]	1999	6	NR	5	1
Hopps et al[18]	2002	4	2-16	2	2
Leroy et al[19]	2003	15	4-16	11	4
Carmignani et a[l4]	2003	10	4-16	10	0
Carmignani et al[20]	2004	3	NR	3	0
Sheynkin et al[21]	2004	9	NR	6	2
Colpi et al[22]	2005	5	3-5	4	1
Connolly et al[23]	2006	5	NR	3	2
Muller et a[l7]	2006	20	1-5	17	3
Powell et a[l8]	2006	4	5-6	2	2
Rolle et al[24]	2006	7	2-16	6	1
Assaf et al[25]	2006	6	4-20	2	2
Avci et al[26]	2008	9	4-9	4	5
Eifler et a[l9]	2008	18	NR	17	1
Hallak et al[27]	2009	5	6.7*	4	1
Toren et al[13]	2010	8	4.3*	7	1
Present study	2012	10	5-19	4	6

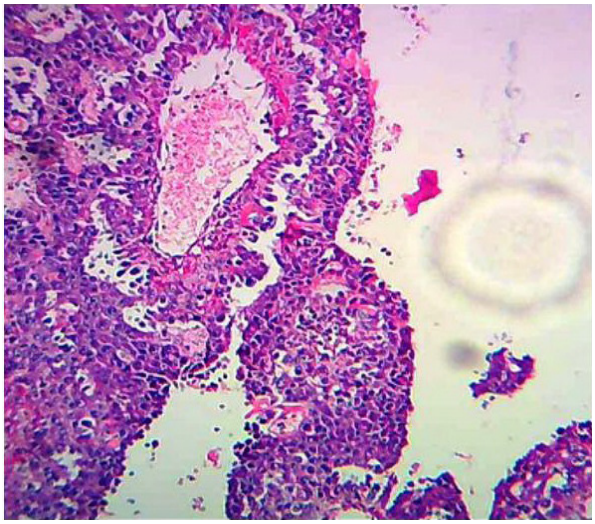

Figure 1. Yolk sac tumor component in a patient with mixed germ cell tumor.

average follow-up duration of 24 months, all were alive and free of disease. All four patients in whom TSS was accomplished had an uneventful postoperative course, and with an average follow-up duration of 20 months, all had normal result in scrotal physical examination and ultrasound.

DISCUSSION

The studies analyzing the etiologies of nonpalpable testicular mass are contradictory; some reporting a high proportion of malignant lesions and other reported benign lesions.[3-5] Nonpalpable incidental testicular masses detected by ultrasound is an increasing situation for urologists and pathologists and base of various reasons there is controversy in management of these lesions, either by radical orchiectomy or TSS and in carefully selected patients surveillance with serial ultrasound.[12-27]

The radical orchiectomy is over treatment for patients with a benign lesion. In the case of a malignant lesion, the risks of TSS include alteration of the predictable pattern of lymphatic spread, a positive margin and unrecognized lesions or carcinoma in situ remaining in the testis. Diagnosis at a higher stage of disease in the case of a malignant lesion is also risk for patients under surveillance. Published studies documenting the pathological diagnosis of these lesions yielded different results. Table 2 summarizes several series in the literature.

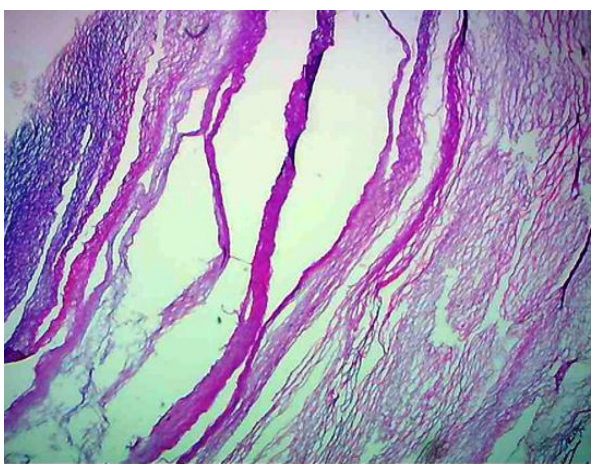

Figure 2. Intratesticular epidermoid cyst.

Horstman and colleagues[16] have reported a series of nine patients with tumors measured less than 2 cm that 78% (7/9) of cases were benign with a final diagnosis of Leydig cell tumors 4 cases , Sertoli cells tumors 2 cases and interstitial fibrosis one patient and only two tumors were malignant (1 seminoma and 1 teratocarcinoma).[16]

Also Carmignani and colleagues studied 27 men with ultrasound-detected testicular lesions and reported an overall 51.8% prevalence of benign disease at permanent histology, which in the cases of nonpalpable lesions 80% were benign.[4] Similarly, in a recent study, Toren and colleagues reported of eight patients with incidentally discovered hypoechoic testicular lesions less than 10 mm, of which 7 cases were benign in final histopathology report.[13] It has been shown that the rate of benign lesions in smaller masses is high and there is a direct correlation between increasing the size and the rate of malignant lesions. Connolly and colleagues showed that 3 of 13 cases (23%) in lesions $\leq$ 1 cm are malignant in contrast to 100% of lesions greater than 3 cm.[10,23] Connolly and colleagues surveyed lesions less than 1 cm, and of the eight hypoechoic lesions with a mean size of 5.8 mm (range 3 to 9.8) only one showed interval growth, increased to a size of 1 cm during a short time and was diagnosed as seminoma on frozen section.[28]

Intraoperative ultrasound localization of nonpalpable testicular tumors has also been suggested and seems to be very useful for detection of nonpalpable tumor specially small ones.[12,18] We did not use intraoperative ultrasound so we had some problem in localization of small lesions in some cases.

CONCLUSION

In any impalpable testicular masses malignancy should be excluded by exploratory surgery.

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