Primary testicular leiomyosarcoma

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Primary testicular leiomyosarcoma is an extremely rare tumor, and, to the best of our knowledge, only 20 cases in adults have been reported in the literature to date. Herein, we present a case of a 68-year-old man who complained of left scrotal swelling for 2 months. Radiological examination revealed a left testicular tumor with no metastases to other organs. A left inguinal orchiectomy was carried out and histopathologic examination revealed an intratesticular leiomyosarcoma. The patient was treated successfully by orchiectomy and received no adjuvant therapy. During follow up until 12 months after surgery, there has been no recurrence or metastases of the disease.

Key Words: leiomyosarcoma, sarcoma, testicular neoplasm

Introduction

Leiomyosarcoma is a soft-tissue cancer arising from undifferentiated smooth muscle cells of mesenchymal origin.[1] Soft-tissue sarcomas account for about 1% of all human cancers.[2] Intratesticular leiomyosarcomas are rare, and, because of this, there is a lack of data about the natural history of the disease, the histological criteria for diagnosis, and the recommended treatment. In patients with localized intratesticular leiomyosarcoma, the prognosis is favorable if radical resection is performed early. Herein we present a case report of a patient with testicular leiomyosarcoma. We then review the literature of this disease.

Case report

A 68-year-old male presented to our clinic with a 2 month history of a left scrotal painless swelling. He had no history of radiotherapy, anabolic steroid intake, or malignant disease. The patient did not report any weight loss, fatigue, or fever. Physical examination revealed a 10 cm x 10 cm hard, firm mass in the left testis. The patient had no superficial lymph node swelling or gynecomastia. His spermatic cord was normal. Transillumination ruled out a cystic mass. Results from routine hematology and biochemistry tests were normal. Levels of the serological markers lactate dehydrogenase (LDH), α-fetoprotein (AFP), and human chorionic gonadotropin-β (HCG-β) were also normal.

An ultrasound scan revealed an atrophic right testis and showed that the left testis contained a 10 cm x 9 cm solid mass with hypoechoic and hyperechoic components without any calcifications, which was suggestive of a tumor. Chest and abdominal computed tomography (CT) imaging scans were normal.

A left inguinal orchiectomy with high ligation of the spermatic cord was performed. Macroscopic examination of the resection material revealed an encapsulated, well circumscribed, yellowish-white, solid mass with small areas of hemorrhage and necrosis. The tumor was 10 cm x 9.5 cm x 7 cm. It existed within the tunica albuginea of the testis. The tunica albuginea was intact, and the rete testis, the epididymis, and the spermatic cord were all unremarkable. The tumor had negative surgical margins.

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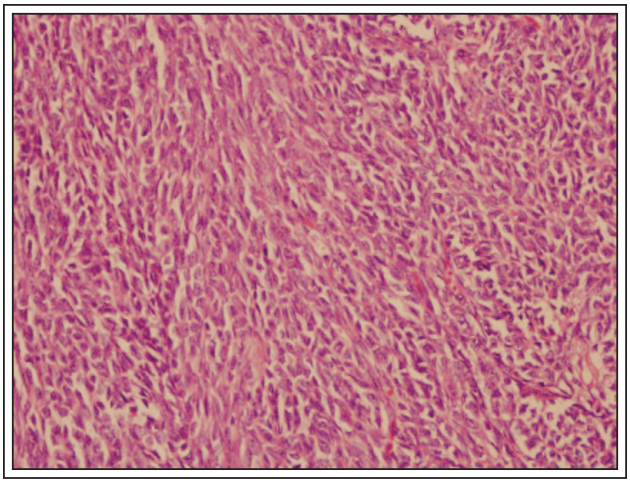

Figure 1. Tumoral structure consisting of atypical cells appearing in a fascicular fashion mostly with spindle and to a lesser extend of polygonal shaped nuclei (H&E x 400).

Microscopic examination showed a high degree of proliferation of spindle cells, which had cigar-shaped nuclei and eosinophilic cytoplasm, and which were arranged in interlacing bundles, Figure 1. There were small areas of necrosis with hemorrhage. There were 2 to 3 mitoses per 10 high power fields.

Immunohistochemical examination revealed that the tumor cells were strongly positive for smooth muscle actin (SMA), Figure 2a, and desmin, Figure 2b, and negative for S-100 protein, vimentin, and CD117.

The patient was diagnosed with a primary intratesticular leiomyosarcoma. He had an uneventful postoperative course and did not receive any adjuvant therapy. Up until 12 months after surgery, there has been no recurrence or metastases. The patient is still under surveillance with close follow up.

Discussion

Leiomyosarcomas of the scrotum can be classified as paratesticular or intratesticular. Paratesticular leiomyosarcomas that originate from the spermatic cord, epididymis, and tunica vaginalis are fairly common. However, primary intratesticular leiomyosarcomas are extremely rare; they are believed to arise from the smooth muscle elements of the testicular parenchyma, such as the blood vessels or the contractile cells of the seminiferous tubules.[3] So far, only 20 cases have been reported in adults in the English medical literature, Table 1. Among these 20 cases, 18 patients had a stage I tumor, one patient[4] (Case 19) had a stage II tumor with metastasis to the para-aortic lymph nodes, and one patient[5] (Case 14) had a stage III tumor with subcutaneous metastatic nodules of 1 to 4 cm on his chest and abdomen.

The etiology of testicular leiomyosarcomas is unknown; however, risk factors have been associated with this disease--such as the use of high-dose anabolic steroids[3] (Case 5), chronic inflammation of the testis[2] (Case 6), and a testicular field radiation for treatment of leukemia[1] (Case 10). None of these risk factors was present in our patient.

A diagnosis of intratesticular leiomyosarcoma should only be made after thorough gross and microscopic examinations. Grossly, paratesticular smooth muscle tumors should be ruled out. Moreover, co-occurrence of the sarcoma and a germ cell tumor is reported to have an adverse prognosis.[6] Therefore, before

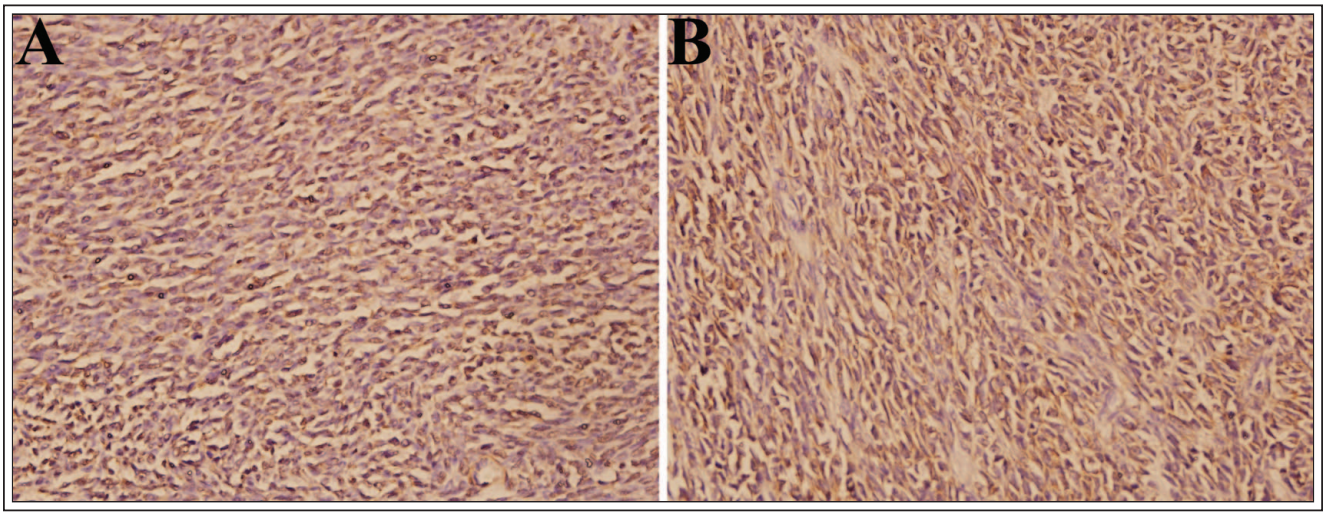

Figure 2. The tumor cells were strongly positive for **a)** smooth muscle actin stain and **b)** desmin stain (x 400).

establishing a diagnosis of primary intratesticular sarcoma, the presence of germ cell tumor elements needs to be excluded. In the current case, a scrotal and abdominal ultrasound evaluation and chest radiography suggested that the patient had a primary testicular tumor. Moreover, the patient had no history of malignant disease. The histological and immunohistochemical evaluations confirmed that the testis contained malignant tumor cells with smooth muscle differentiation among seminiferous tubules, and the evaluations ruled out the presence of germ cell tumor cells or the involvement of paratesticular structures.

The rarity of this cancer, and hence the lack of literature, makes it difficult to define and optimize

TABLE 1. **Summary of primary intratesticular leiomyosarcoma cases in the literature**

Case no.	Author, reference	Age	Treatment	Follow up (months)	Risk factor	Clinical stage	Level of tumor markers	Outcome
1	Yachia et al[11]	55	orchiectomy	24	-	I	normal	survived
2	Pellice C al[12]	37	orchiectomy	24	-	I	normal	survived
3	Washecka et al[6]	47	orchiectomy	49	-	I	normal	survived
4	Washecka et al[6]	40	orchiectomy	42	-	I	normal	survived
5	Froehner et al[3]	32	orchiectomy + RPLND	79	anabolic steroid	I	unknown	survived
6	Ali et al[2]	65	orchiectomy	12	chronic inflammation	I	normal	survived
7	Hachi et al[10]	70	orchiectomy	14	-	I	normal	died (pulmonary metastasis)
8	Sattary et al[13]	27	orchiectomy	30	-	I	normal	survived
9	Singh et al[14]	26	orchiectomy	-	-	I	normal	survived
10	Canales et al[1]	30	orchiectomy	6	radiation	I	unknown	survived
11	Takizawa et al[15]	76	orchiectomy	12	-	I	normal	survived
12	Borges et al[8]	19	orchiectomy + CTx + RT	16	-	I	normal	survived (retroperitoneal recurrence)
13	Kumar et al[16]	65	orchiectomy	6	-	I	normal	survived
14	Yoshimine al[5]	73	orchiectomy + CTx	9	-	III	HCG slightly elevated	survived
15	Raspollini et al[17]	77	orchiectomy	12	-	I	normal	survived
16	Tobe et al[18]	71	orchiectomy	7	-	I	normal	survived
17	Labanaris et al[19]	73	orchiectomy	28	-	I	normal	survived
18	Giridhar al[9]	55	orchiectomy + CTx	11	-	I	normal	died (soft tissue and bone metastasis)
19	Moona et al[4]	45	orchiectomy + CTx	-	-	II	normal	survived (para-aortic LN metastisis)
20	Bakhshi et al[7]	60	orchiectomy + RT	12	-	I	LDH elevated	survived
21	Present case	68	orchiectomy	12	-	I	normal	survived

CTx = chemotherapy; HCG = human chorionic gonadotropin; LDH = lactate dehydrogenase; LN = lymph node
RPLND = retroperitoneal lymph node dissection; RT = radiotherapy

therapy. A radical orchiectomy was carried out in all reported cases, Table 1. Fourteen patients who had stage I disease did not receive any adjuvant treatment. Among the other four patients with stage I cancer, one patient[3] (Case 5) underwent retroperitoneal lymph node dissection that revealed a negative lymph node, one patient[7] (Case 20) received adjuvant radiation therapy, and two patients (Case 12 and Case 18) underwent chemotherapy.[8-9] Of these two patients, one[8] (Case 12) received adjuvant chemotherapy (gemcitabine plus docetaxel) and radiotherapy to prevent metastasis after orchiectomy, as histopathology examination had revealed high grade, stage I intratesticular leiomyosarcoma. After 16 months of follow up, a CT scan revealed a bulky mass in the retroperitoneum. This mass, as well as a kidney, and a segment of the ileum were removed en bloc. Microscopy confirmed distant recurrence of cancer, and the patient received salvage chemotherapy. The other patient who received chemotherapy[9] (Case 18) presented 8 months after radical orchiectomy with diffuse soft tissue and bone metastasis and was referred for chemotherapy with Adriamycin.

One patient who had clinical stage II disease[4] (Case 19) and one patient who had stage III disease[5] (Case 14) both received additional adjuvant chemotherapy with cyclophosphamide, vincristine, Adriamycin, and dacarbazine (CYVADIC). Among the 20 cases, one patient[10] (Case 7) developed pulmonary metastasis 14 months after surgery and another[9] (Case 18) developed diffuse soft tissue and bone metastasis 8 months after surgery; all other cases showed no recurrence at 6 to 79 months after surgery Table 1.

Because of the rarity of testicular leiomyosarcoma, there are no clear guidelines for its treatment. Based on a literature review, there is no question that orchiectomy is the treatment of choice; however, it is difficult to recommend a standard therapy. If the CT scan shows no secondary metastasis, nothing more should be done after radical orchiectomy; only semiannual surveillance with imaging studies is required. In intratesticular leiomyosarcoma, if radical resection is performed, the prognosis seems to be better than for paratesticular leiomyosarcoma.

The finding that patients with high grade tumors presented with distant metastases shortly after treatment of the primary lesion suggests that it may be preferable to recommend adjuvant chemotherapy in these cases. Moreover, patients with low grade tumors can present with late metastasis, and hence close surveillance is recommended. Semiannual surveillance with chest and abdominal CT studies is recommended.

Further epidemiologic and clinical studies are required to evaluate the need for adjuvant chemotherapy and the long term metastatic potential in patients with primary intratesticular leiomyosarcoma. □

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