CASE STUDY

CONTENTS

Fertility before and after treatment of the patient with Leydig cell tumor – case report

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ABSTRACT

Even though Leydig cell tumor (LCT) represents the most common neoplasia among testicular sex cord–stromal tumors (SCSTs), it is a rare condition, comprising 1-2% of all testicular tumors, with a 10% risk of malignancy most commonly located in retroperitoneal lymph nodes. LCTs may demonstrate various clinical manifestations – from asymptomatic intratesticular swelling through nonspecific symptoms such as loss of libido, impotence or infertility, up to feminizing or virilizing syndromes due to hormonal activity of the tumor. This article presents a case of Leydig cell tumor that was associated with azoospermia what have rarely been reported worldwide. A 27-year-old male presented to the urologist with one-month history of palpable testicular mass. Imaging tests revealed a well demarcated solid focal lesion in the upper pole of the left testicle and semen analysis indicated azoospermia. Due to small testicular lesion, negative serum markers and negative reports for malignancy in MRI imaging, testis-sparing surgery (TSS) was performed. The final histopathological examination revealed a Leydig cells tumor positive for inhibin, calretinin and MelanA. Six months after the surgery spermatogenic function was partially restored what have rarely been reported in scientific papers. This case indicates that TSS may provide an effective way of semen quality improvement, although further research is required.

KEY WORDS: Leydig cell tumor, sex cord–stromal tumors, azoospermia, testis-sparing surgery, fertility

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INTRODUCTION

Although testicular cancer is a relatively rare tumor, accounting for 1-2% of all oncological diagnoses in men generally, it remains the most common neoplasm and most frequent malignancy in young men (aged 15-40) [1, 2]. Even though Leydig cell tumor (LCT) represents the most common neoplasia in the testicular sex cord–stromal tumor (SCSTs) category, it continues to be an unusual diagnosis due to the fact that SCSTs represent only about 5% of all testicular neoplasms [3]. Leydig cell tumors are hormonally active with excessive steroid secretion which may lead to variable endocrinological findings [4]. While children typically present with feminizing or virilizing syndromes, most adults remain asymptomatic due to infrequent noticeable effects of the excess androgen in this group of patients [4]. Some may demonstrate nonspecific symptoms such as loss of libido, impotence or infertility [4]. The most frequent manifestation is a palpable intratesticular mass [5] but due to poor knowledge about the importance of testicular self-examination, patients rarely present with this sign [6].

AIM

This article presents a case of a Leydig cell tumor that was associated with azoospermia which has rarely been reported worldwide.

CASE REPORT

In December 2022, a 27-year-old male from Eastern Europe presented to the private clinic with a 1-month history of left testicular swelling. The clinical examination was negative for any other symptoms. Patient did not suffer from any chronic illnesses and family history was negative for testicular tumours. An ultrasound of the scrotum and testes revealed a well demarcated solid focal lesion with homogeneously reduced echogenicity in the upper pole of the left testis measuring 12x11x11 mm. The dimensions of the left testis was approximately 26x24x42 mm. The left epididymis was normal and the amount of fluid between the testicular sheaths was within the normal limits. The diameter of left spermatic vein did not exceed 2 mm. The right testis appeared homogenic and normoechoic measuring approximately 25x21x42

Table 1. Results of semen analysis before and after treatment.

	Before treatment	After treatment	Reference value
Duration of abstinence [days]	7	5	2-7
Liquefaction time [min]	30	< 60	< 60
Color	clear	grey-white – milky	grey-white – milky
Semen volume [ml]	4.50	5.00	> 1.40
Total sperm number [mln/probe]	0	28	>39
Sperm concentration [mln/ml]	0	5.6	>15
pH	8.5	8.3	> 7.2
Number of round cells [mln/ml]	0.20	single	< 5.00
Total motility [%]	0%	37.82%	>42%
Progressive motility [%]	0%	9.33%	>30%
Normal forms [%]	0%	1.33%	>4%
Comments on the preparation:	Lack of spermatozoa neither in the direct nor in the sediment preparation		

mm. The right epididymis was normal and the diameter of right spermatic vein did not exceed 1,5 mm. A primary testicular neoplasm was suspected and the patient was referred to the hospital for further diagnostics. Blood tests including tumor markers and semen analysis were also recommended.

The patient's blood test results were within normal limits: beta-HCG (performed twice within 2 weeks): <0.200 mIU/ml (0.0-2.0), AFP 1.020 ng/ml (0.000-7.000), LDH 171 U/l (135-225), Syphilis antibodies: negative, HIV Ab/Ag Elecsys HIV Duo: negative.

Semen analysis indicated azoospermia (total absence of spermatozoa in the ejaculate) (Table 1).

In January 2023 MRI of the scrotum was performed and revealed a contrast-enhancing lesion in the upper pole of the left testicle located near the border of epididymis with the dimension of 11x15x15 mm.

Due to relatively small size of the lesion, negative serum markers and negative reports for malignancy in MRI imaging the patient was offered a testis-sparing surgery (TSS) proceeded by sperm cryopreservation, however, two consecutive tests failed to obtain sperm for freezing.

About two weeks later, removal of the left testicular tumor with preservation of healthy testicular tissue was performed. Intraoperative frozen section evaluation indicated tumor with low malignant potential and negative margins. The final histopathological examination revealed a Leydig cells tumor positive for inhibin, calretinin and MelanA. The analysis of unaffected testicular parenchyma adjacent to tumor cells indicated preserved spermatogenesis with the formation of mature sperm cells.

Three months after the surgery, the follow-up CT-scan of the chest, abdomen and pelvis revealed numerous borderline enlarged mesenteric lymph nodes. Despite mesenteric lymph nodes remain infrequent localization of Leydig cell tumor metastases, this finding required further investigation. The PET-CT scan with 18F-FDG revealed neither pathological 18F-FDG accumulation in the mesenteric lymph nodes nor hypermetabolic features of testicular tumor recurrence.

Postoperative levels of serous markers were within normal limits: LDH 191 U/l (135-225), beta-HCG <0.2 mIU/ml (<2.6), AFP <0.9 ng/ml (<7.0).

The spermiogram performed 6 months after the surgery showed improvement of semen parameters (Table 1).

DISCUSSION

The Leydig cell tumor is a rare condition, comprising 1%-2% of all testicular tumors, with a 10% risk of malignancy most commonly located in retroperitoneal lymph nodes [7]. LCTs belong to the steroid hormone-synthesizing neoplasms what may lead to infertility due to impaired spermatogenesis. It is mostly explained by long-term inhibition of the hypothalamic-pituitary axis and direct effects on the testes [8]. Although the neoplastic process affected only one gonad, impaired spermatogenesis was present in both testes leading to azoospermia. After TSS, the spermatogenic function was partially restored what supports the conclusion that azoospermia was due to the neoplastic process. Moreover, the histopathological analysis of unaffected testicular parenchyma adjacent to tumor cells indicated preserved spermatogenesis with the formation of mature sperm cells. This finding indicates that testicular activity preserved at the cellular and tissue level was efficiently suppressed by tumor cells. Due to patient failure to follow-up we do not have an information about subsequent semen analyses. The literature review indicates that isolated cases have been reported so far [9, 10]. In described cases the authors hypothesized that impaired spermatogenesis could result from endocrine disruption such as androgen-induced decrease in gonadotropin secretion. A limitation of our study, given the context of the potential sources of patient's azoospermia, is lack

of information on his hormone levels. Nevertheless, we decided to publish this case because of infrequently described finding such as restoration of spermatogenic function following TSS.

CONCLUSIONS

Leydig cell tumors are very rare, accounting for 1% of testicular tumors. Its clinical features may vary from asymptomatic intratesticular swelling to the symptoms resulting from hormonal disbalance. In this case, the patient who primarily presented with a history of intratesticular mass, was diagnosed with azoospermia. After the testis-sparing surgery was performed, spermatogenic function was partially restored. In patients with Leydig cell tumor who are eligible for TSS, this type of treatment may provide an effective way of semen quality improvement, although further research is required.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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