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Burned-out testicular cancer - case report

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Abstract

Introduction and Purpose

Germ cell tumors of the testis are the most common malignant tumors in young men aged 15-40, although their incidence in the male population is about 1-1.5%. 90-98% of all testicular tumors originate from germ cells. There has been an increase in the incidence of testicular tumors in recent years, suggesting the influence of both genetic and environmental factors. Testicular cancer, which accounts for about 5% of all urological cancers and mainly affects young men. Most of these cancers originate from germ cells, and cases of spontaneous tumor regression are extremely rare.

Aim of the study

We present the case of a 36-year-old man who was found to have a left testicular tumor with negative tumor markers during physical examination and testicular ultrasound. The tumor was surgically removed, and the patient was discharged home. Histopathological examination showed that the tumor had completely necrosed, and a CT scan showed no metastasis.

Results and Future directions

The phenomenon of testicular tumor “burnout” has been described since 1927, but it was only in 2016 that the WHO recognized it as a separate disease entity. Despite the rarity of this phenomenon, more and more cases are being reported in the literature, allowing for a better understanding of the underlying mechanisms. It is important to remember that the tumor can give a variable clinical picture and its symptoms are not necessarily related to the location of the tumor, but to its metastasis. Physical and ultrasound examinations are key to making a correct diagnosis. Histologic features such as scar formation, intravesicular

calcification, lymphoplasmocytic infiltration and testicular atrophy can help diagnose germ cell tumor. The findings of this case demonstrate the need for diagnostic vigilance, especially in patients with equivocal tumor marker results but with clinical signs of testicular tumor.

Keywords: Testicular cancer, spontaneous regression, germinal cells

Introduction

Testicular germ cell tumors (TGCTs) are the most common malignant tumors occurring in young men aged 15-40 years, although their incidence in the male population is only 1-1.5% [13]. Testicular cancer accounts for about 5% of all urological cancers and mainly affects men of young age [7]. As many as 90-98% of testicular tumors originate from germ cells, which are the most numerous cell population in the testis [18]. Germ cell tumors are divided into seminomas, which are the most common testicular cancer, and non-seminomas [17]. In recent years, there has been a steady increase in the number of TGCT cases, suggesting both genetic and environmental influences. The familial risk of developing TGCT is particularly high - brothers of patients have a 5-19-fold increased risk of developing the disease, and sons of carriers of this cancer have a 2-4-fold increased risk compared to the general population [13]. A clinically rare phenomenon is complete or partial and spontaneous regression of the tumor with metastases already present [23]. In terminology, this tumor is called “burned out” or “spontaneously regressing” to show its spontaneous regression [11]. Some epidemiological data confirm that the onset of testicular cancer may begin as early as in utero and be related to expression on estrogen. In addition, factors responsible for the occurrence of testicular tumors include genetic diseases, neonatal jaundice, low and high birth weight, gonadal dysgenesis, cryptorchidism, family predisposition, hernia in childhood and testicular atrophy [14]. The observed increase in the incidence, especially among young men, underscores the need for early diagnosis and prevention. In order to detect tumors early, regular self-examination of the testicles and ultrasound (USG) examination of the scrotum is recommended in case of alarming symptoms [24]. In the case of clinical suspicion of a malignant testicular tumor, the standard treatment is surgical removal of the testicle (orchidectomy), and further therapy - including chemotherapy or radiation therapy - depends

on the histopathological results and the stage of the disease [13]. The case report of a patient with a testicular tumor that regressed spontaneously is extremely rare and interesting in medicine [26]. Testicular tumors, especially malignant tumors such as seminomas and non-seminomas, usually require surgical intervention, chemotherapy or radiation therapy. Spontaneous tumor regression, defined as partial or complete resolution of a malignant lesion, remains an incompletely understood phenomenon and is rarely described in the literature. In this paper, we present the case of a patient with a palpable testicular tumor that regressed completely without distant metastasis.

Case description

A 36-year-old man presented to the Hospital Department of Urology and Oncology for diagnosis of a palpable right testicular tumor. The patient had no previous history of oncology, no chronic diseases, non-smoker for 7-8 years, and previously smoked a pack a day for 12 years. No aggravating family history. On physical examination, a left testicular tumor was palpable without palpably enlarged lymph nodes. The right testis on examination was unchanged. An ultrasound of the patient's testes and urinary tract was performed, which showed a central anatomical lesion of mixed echogenicity in the left testis about 17 mm in diameter with visible vascular flows, while the right testis was normal. In laboratory tests, tumor markers were negative: AFP 3.08 IU/ml and beta-HCG <0.2 mIU/ml. Based on the patient's overall clinical picture, it was decided to surgically remove the left testicle. The operation to remove the testicle went well, without complications. The patient was discharged home the next day with recommendations for a CT scan of the abdomen, pelvis minor and chest, and follow-up at the urology clinic. The postoperative histo-pathological examination performed showed a 2 cm germinal tumor that had undergone complete spontaneous necrosis. A CT scan performed showed enlarged periaortic lymph nodes. Follow-up laboratory tests further indicated negative tumor markers AFP 3.0 IU/ml and beta-HCG <0.2 mIU/ml. No distant metastasis was demonstrated. The patient remained under the control of the urology outpatient clinic.

Discussion

The literature mentions two mechanisms that cause tumor self-limitation. The first mechanism involves ischemic damage to the tumor which can be caused by shrinkage of the nucleus, resulting in its ischemia and insufficient replenishment of its metabolic requirements.

The second theory relates to the activity of the immune system and its action through the body's cytotoxic T lymphocytes. These cause the destruction of tumor cells and their fibrosis. However, neither of these hypotheses has been completely confirmed by any study [11]. Most of the recognized urological scientific societies do not provide specific guidelines for the treatment and diagnosis of burned testicular tumors. Until recently, testicular tumor undergoing spontaneous regression was a phenomenon described quite rarely in the literature, while in recent years the number of described cases has increased significantly, which allows for a better understanding of the phenomenon of tumor "burnout" [10] The first mention of a tumor of this type dates back to 1927 and was described by Prima, who found a scar on the right testicle during an autopsy in one of his patients and posed the question "whether it could have been primary and represented spontaneous healing" [2,19]. It was not until 2016 that the WHO officially recognized spontaneous regression of testicular tumor as a separate entity. An important element in the treatment of testicular cancer is the effectiveness of its treatment. Orchidectomy is the standard surgical procedure and is the mainstay of treatment for this cancer. Complementary chemotherapy or radiation therapy, depending on the stage of the disease, yields good results, as reflected in the high 5-year survival rate of patients with TGCT, which is 95-99% in cases detected at an early stage [15]. However, it should be noted that the aggressiveness of the therapies used, including treatment of advanced stages of the tumor with chemotherapy, is associated with the risk of complications, such as nephrotoxicity, ototoxicity or long-term effects on patient fertility. Therefore, it is necessary to continue the search for therapeutic strategies that minimize side effects while maintaining high treatment efficacy [5]. Looking ahead to the treatment of testicular tumors, it is worth noting the development of molecular therapies, which in the future may provide an alternative to classical treatments. In recent years, research into cancer genetics, including mutations in the KIT or KRAS genes, has opened up new therapeutic possibilities. Testicular tumor markers (hCG, AFP and LDH) play an important role in the diagnosis, staging and surveillance of seminoma and NSGCT. There is an apparent correlation between elevation of tumor markers and disease severity. Tumor markers should be monitored as part of the standard surveillance protocol after treatment of testicular cancer, regardless of the presence of initial marker elevation or tumor histopathology. However, tumor markers cannot replace histopathologic examination of resected tissue because of their low sensitivity and specificity. There are a number of new and potentially clinically useful alternative germline markers for testicular tumors. These include NSE, TRA-1-60, PLAP, lectin-responsive AFP and circulating cell-

free DNA [16]. Therapies targeting these molecular alterations could be a more precise tool for treating patients, especially those for whom traditional treatments are unsuccessful [9]. As data indicate, the incidence of testicular cancer remains highest in developed countries with a predominantly Caucasian population [22].

Conclusions

Burned-out testicular tumor is a rare phenomenon that must be taken into account in the differential diagnosis of testicular tumors [25]. Physical examination as well as ultrasound examinations are mandatory in all men at risk and, despite the patient's variable clinical presentation, allow us to make a correct diagnosis and undertake treatment [3,8]. Symptoms reported by the patient such as lumbar pain, night sweats or weakness may not always be strictly related to the tumor itself, but to its metastasis [1]. Histological features that are helpful in establishing the diagnosis of testicular germ cell tumor include scar formation, intravesicular calcification, lymphoplasmocytic infiltration, hemosiderin-containing macrophages and testicular atrophy [6]. Analyses of a larger number of cases show that some of the scars remaining from testicular tumors may be small despite the presence of metastases [20]. This indicates increased vigilance when examining samples with testicular tumor features [21]. Even in cases where the test sample is negative, but the patient's clinical picture indicates a testicular tumor, one must consider spontaneous tumor regression [4]. In the case presented above, the only sign of tumor in the patient was a palpable testicular tumor, occurring without elevated tumor markers or lymph node metastasis [12].

Author's contribution

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