Embryonal carcinoma of an intraabdominal testicular tumor on an undescended testicle: a case report

Mihai Domnutiu Suciu[1,2], Nucu Alexandru Marica[1,2], Traian Oniu[3], Andrei Ionut Tomuta[1], Radu Badea[4]

1) Institute of Urology and Renal Transplantation, Cluj-Napoca, Romania

2) Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

3) CF Clinical Hospital, Cluj-Napoca, Romania

4) Department of Medical Imaging, Iuliu Hatieganu University of Medicine and Pharmacy, "Prof. Dr. Octavian Fodor", Regional Institute of Gastroenterology and Hepatology Cluj-Napoca, Romania

Abstract

Cryptorchidism, as a singular pathology or associated with other dysgenesis syndromes, is one of the main factors of risk for the development of the testicular tumors. Although there are a great number of cases of undescended testicles that are diagnosed and treated during the first 6-12 months of life, there are rare cases of adults who are undiagnosed and untreated from this anomaly, which can present a high risk of malignancy.

In this study we present the case of a 36-year-old patient, diagnosed at puberty with left cryptorchidism, untreated, who also hadevidenced a large intraabdominal tumoral mass associated with it. The tumoral mass had its origin in the undescended left testicle. Surgical excision of the tumor and retroperitoneal lymphadenectomy was performed. The histological result revealed embryonal carcinoma, without lymphnode metastasis.

Adult patients with untreated cryptorchidism should be thoroughly investigated, as they have a high risk of developing testicular cancer.

Keywords: cryptorchidism, embryonal carcinoma, abdominal cavity, testicular neoplasms

Introduction

5% of all urological tumors and 1% of all cancers found in the global male population are represented by testicular neoplasms, while in Western Europe the age-standardized incidence has been reported to be even higher (7.8%) [1,2]. Seminomas are most often diagnosed in the 25- to 40-year-old age group, whereas nonseminomatous tumors occur in even younger men (adolescence to 30 years) [3,4].

Cryptorchidism represents the absence of a testicle in the scrotum. The classic definition of the ectopic testicle is the following: "the truly cryptorchid testis is the testis that lies above the external inguinal ring, either within the inguinal canal or within the abdomen, and it is nonpalpable in the unanesthetized patient" [5]. It occurs when there is a congenital defect in the embryological process of testicular descent [6]. Cryptorchidism increases the risk of malignant transformation up 5-10 times compared to the normal population [7]. Because of the improved diagnostic techniques available today and methodical performing of orchidopexy in the infant period, cases of testicular tumors formed on undescended testis are rarely seen and reported in the urologic field.

Case report

We present the case of a 36-year-old male patient, of urban origin, who was admitted to hospital with left iliac fossa pain and fatigue. The patient had been diagnosed with left cryptorchidism by his primary care physician at puberty, although he had not been investigated further and no warnings had been raised regarding his increased malignancy risk. He has 2 children and an active sexual life. He was not known with any other malignancy or disease. Clinical examination revealed that

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Address for correspondence:
nucu.marica@gmail.com

the left testicle was not palpable in the left hemiscrotum, nor in the inguinal canal; palpation of the abdomen revealed a tumoral mass in the left iliac fossa. There was no palpable supraclavicular lymphnodes. Blood test results were normal (WBCs 5 × 10^9/L, Hgb 15 g/dL, blood creatinine 0.8 mg/dL), while serum tumoral markers were elevated: Alpha-fetoprotein (258 U/I) , human chorionic gonadotrophin - hCG (15000mIU/ml), Lactate dehydrogenase (507 U/I).

Scrotal intravenous CEUS (Contrast-Enhanced Ultrasound) using SonoVue™ described only the right testicle in the scrotum, which was formed normally, while abdominal ultrasound demonstrated a pelvic tumor, 11x10x7 cm , with a well defined, inhomogeneous structure, hyperenhancing from periphery to the center (Figure 1).

Abdominal contrast-enhanced computed tomography raised concerns over tumoral invasion in the anterior rectal wall (Figure 2), but the MRI described an incapsulated tumor, in contact with the rectum, sigma, bladder, seminal vesicles and ileus (Figure 3). Enlarged left paraaortic lymphnodes were also discovered.

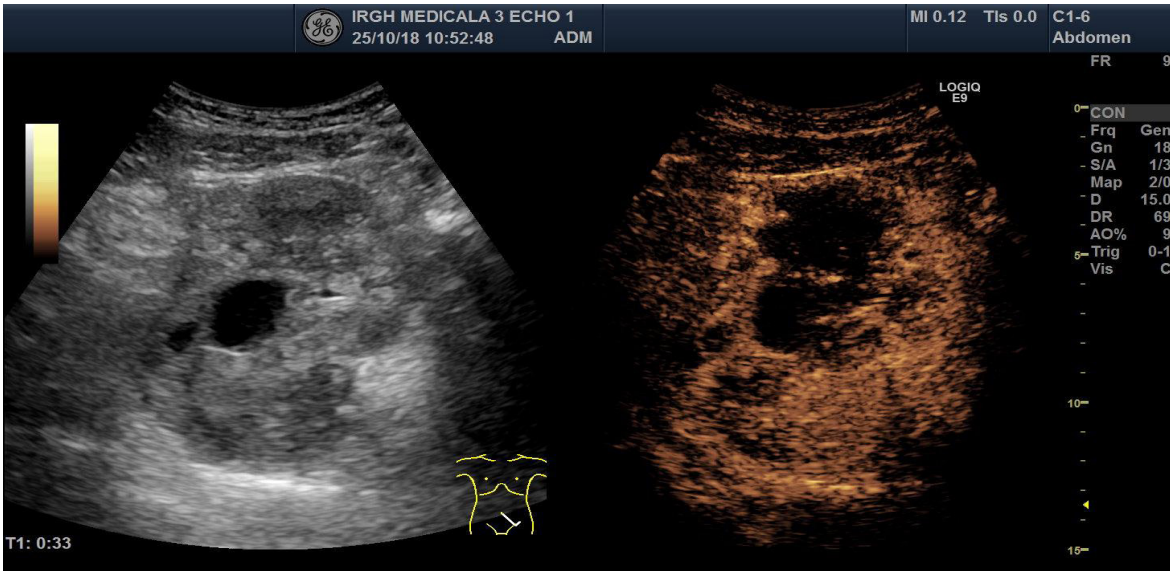

Figure 1. Abdominal ultrasonography performed in standard and SonoVue-enhanced mode.

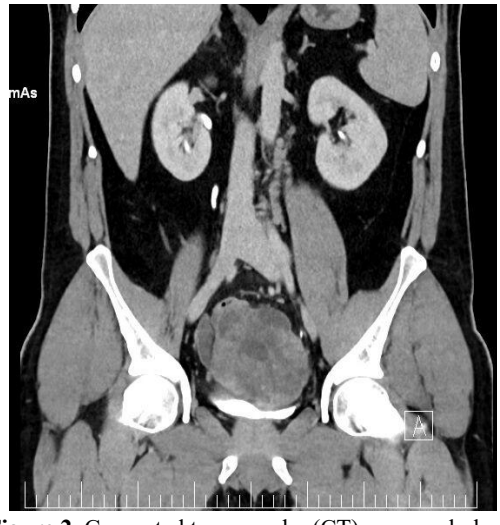

Figure 2. Computed tomography (CT) – coronal plane.

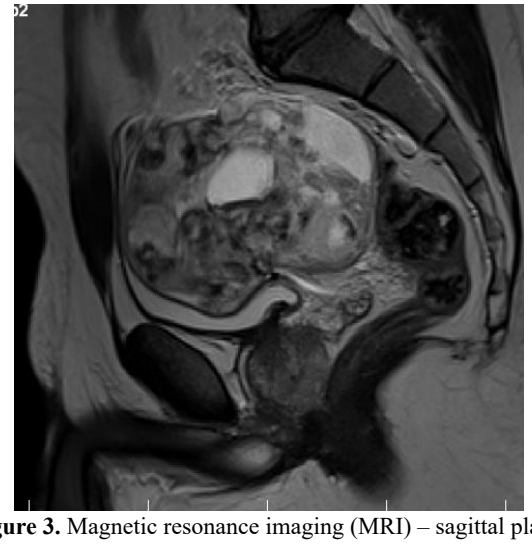

Figure 3. Magnetic resonance imaging (MRI) – sagittal plane.

Surgical exploration through laparotomy was performed and it revealed a large retroperitoneal tumor (330 mL) (Figure 4), well defined, without invasion of the nearby organs, and enlarged left paraaortic lymphnodes (Figure 5).

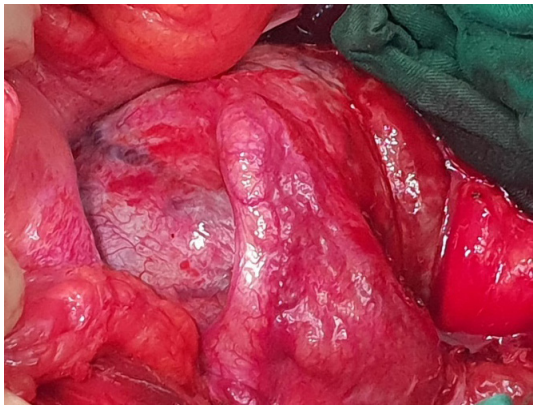

Figure 4. Intraoperative aspect of the tumor.

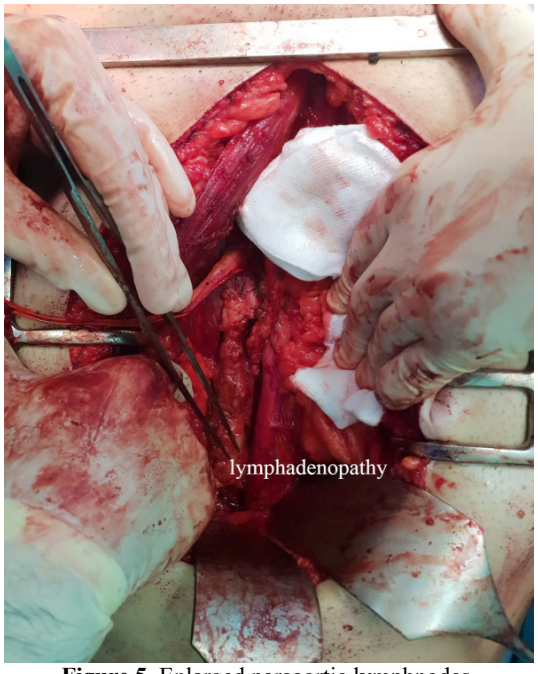

Figure 5. Enlarged paraaortic lymphnodes.

Tumor excision and modified left template retroperitoneal lymphadenectomy (RPLND) were performed (Figure 6). There were no intraoperative or postoperative complications. The patient received antibiotic treatment with Ceftriaxone and pain medication. The urinary catheter was removed the following day and the patient was discharged after 3 days.

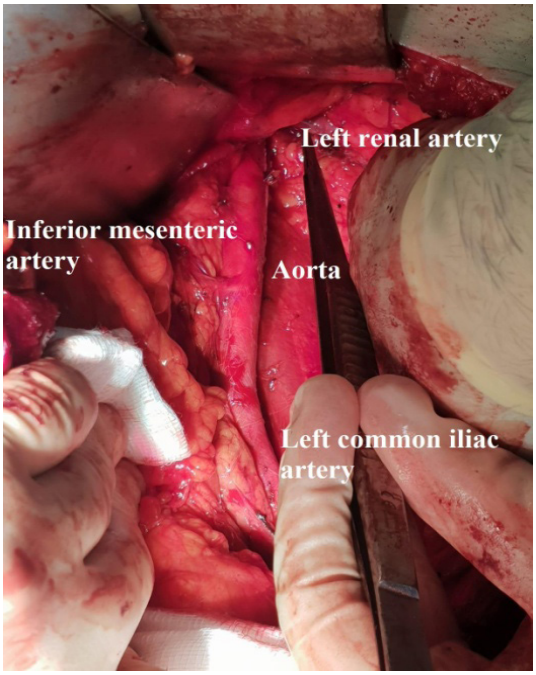

Figure 6. Left retroperitoneal lymph node dissection.

Histopathological examination of the retroperitoneal mass showed pure embryonal carcinoma (Figure 7). The tumor had a solid pattern, composed of primitive epithelial type cells, with minimal features of differentiation. There were mainly high grade features consisting of large, epithelioid cells with prominent nucleoli, indistinct cell borders with nuclear overlapping, pleomorphism, frequent mitoses and with important syncytiotrophoblastic components (Figure 8). Necrosis and intratumoral hemorrhage was present. All excised lymphnodes contained histiocytosis, but without tumoral invasion.

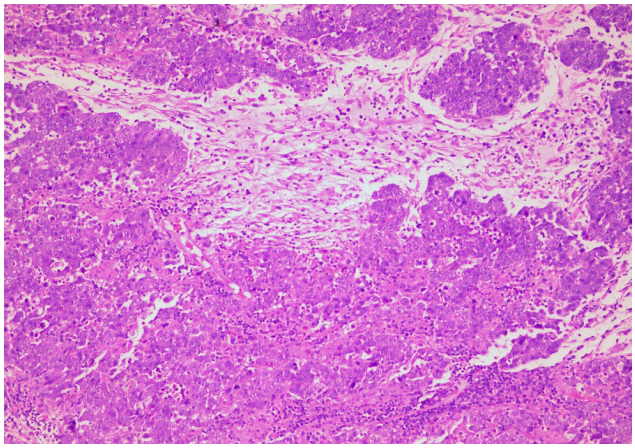

Figure 7. Embryonal cell carcinoma, H&E stain 10x.

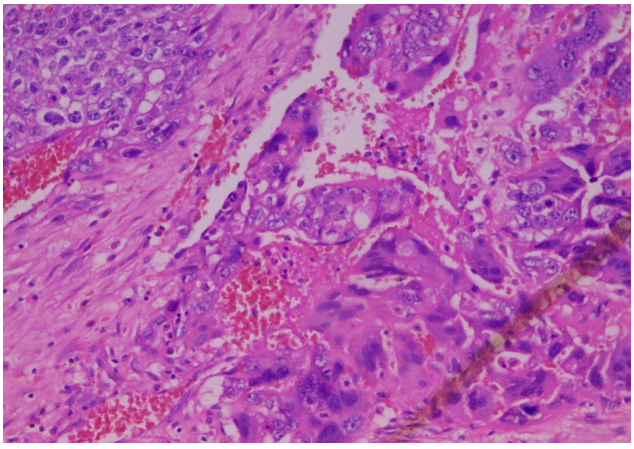

Figure 8. Syncytiotrophoblast component, H&E stain 20x.

The patient was additionally assessed by chest CT which showed multiple right pulmonary nodules of 10-12 mm. His stadialization was embryonal carcinoma pT2N0M1(a)S2 stage group IIIB, IGCCCG (International Germ Cell Cancer Collaborative Group) intermediate-prognosis group. He was sent for oncological surveillance where, based on his prognostic group and ECOG Performance Status of 0 (Eastern Cooperative Oncology Group), he followed adjuvant chemotherapy (4 cycles of BEP - bleomycin, etoposide, cisplatin) with serum markers regression within normal limits after the first cycle, thus being considered chemotherapy-responsive. At the end of the 4 cycles, a follow-up chest and abdominopelvic CT was made which did not show any metastases. Taking into account the RECIST 1.1 criteria [8] the case was considered a complete response. A PET-CT was performed as a 6 months follow-up, without any metastases found, and serum markers in normal limits. The follow-up scheme after complete remission consists of serum markers and doctor visit every 3 months for the first two years and every six months until the 5th year, abdominopelvic and chest computed tomography at 12 months, 24 months, 36 months and 60 months.

Discussion

Cryptorchidism affects 2% - 4% of term male infants and up to one third of premature male newborns, thus it can be considered a common pathology [9]. It occurs when the testicle fails to descend from the lumbar region to the scrotum during natural migration. Long term cryptorchidism can lead to infertility, hormonal changes and neoplastic degeneration [10]. The higher the region of testicle descent is (inguinal, abdominal) the higher the risk of malignancy [11]. The recommended age for orchidopexy has fallen progressively over the last 50 years, from adolescence in the 50s and 60s to 6-12 months in recent times [5]. Since the testicle may descend spontaneously during the first months of life, orchidopexy should not be performed in the first 6 months [12], and ideally before 12 months, in order to optimize fertility outcomes [13]. Concerning testicular malignancy, it has been stated that that there is a relative risk between 2 and 3 noted in patients who have undergone orchidopexy by ages 10 to 12 years, while patients with no orchidopexy, or performed after the age of 12, are 2-6 times more likely to have testicular cancer [14,15].

Regarding the management of undescended testis, the RR of malignant pathology in undescended testes is 40 times higher than in descended ones. Taking into account the mortality rate due to cancer and surgical risks associated with orchiectomy, earlier studies (Farrer- 1985) have suggested the age of 32 should be the age limit for orchiectomy in undescended testicles [16]. From this point of view, a study stratified the anesthetic risk by ASA classification and recommended performing orchiectomy up to 50 years in ASA I and II patients, and it may also be considered in the case of healthy ASA I for patients up to 60 years [17].

Out of all the malignant tumors developed from uncorrected abdominal or inguinal testes, 74% are seminoma, while corrected cryptorchid or scrotal testicles that undergo malignant transformation are most likely to become nonseminomatous (63%), presumably because of a decreased risk of seminoma [18].

While we used abdominopelvic computed tomography for diagnostic purposes, it was also useful for staging purposes, as it is known that it has a sensitivity of 70-80% in assessing retroperitoneal metastatic nodes [19]. In cases of testicular tumors, the European Association of Urology states in its dedicated guideline a strong recommendation that chest CT is performed in all patients [1]. It has been previously reported that one in ten patients can present minor subpleural nodes that are not seen on X-ray [20]. Computed tomography or MRI of the brain is indicated in the case of coexistence of non-seminomatous germ cell tumors, pulmonary metastases and a poor-prognosis International Germ Cell Cancer Collaborative Group (IGCCG) risk group – values of elevated beta-hCG [1]. Although there is also a recommendation to perform fertility investigations - semen analysis, Follicle-stimulating hormone (FSH), Luteinizing hormone (LH), total testosterone – they were not performed.

Embryonal carcinoma is one of the most common components in mixed germ cell tumors, while pure embryonal carcinoma only occurs in 3-4% of the cases [21], usually occurring in the second and third decade of life [22]. It is an aggressive tumor associated with a high rate of metastasis while tumoral markers are often at normal levels. Embryonal carcinoma is known to have the highest probability of lymphatic and vascular invasion and also of extension into the paratesticular tissue [23], as it also has the tendency to early hematogenous dissemination. Patients diagnosed with embryonal carcinoma usually have metastatic disease, and half of them have distant metastases

[24]. Mediastinal primary tumor, nonpulmonary visceral metastasis or post-orchiectomy markers any of: AFP > 10,000 ng/mL, beta-hCG > 50,000 iu/L, LDH > 10 × upper limit of normal, are considered unfavourable prognostic factors for non-seminoma [25]. Patients with IGCCG intermediate-prognosis group are considered to have a 5-year progression-free survival of 75% and 5-year survival of 80% [26].

Contrast-enhanced ultrasound (CEUS) is the application of ultrasound contrast medium to traditional ultrasonography. Although conventional grayscale ultrasonography and color Doppler ultrasonography are considered gold standard techniques for evaluating scrotal masses [27], recent studies have pointed out the advantages of complementary CEUS in characterizing testicular neoplasms [28,29]. SonoVue (Bracco SpA, Milan, Italy), which is considered one of the most frequently used contrast agents in (CEUS), is a second-generation contrast agent that uses sulphur hexafluoride microbubbles for CEUS imaging in adults, enhancing blood echogenicity and improving the signal-to-noise ratio in ultrasonography [30]. In a prospective study of 68 patients where CEUS, real-time elastography, B-mode and color-coded Doppler sonography of scrotal tumors were performed, Schröder et al. recommend using CEUS in small testicular masses, where it is impossible to differentiate between malignant and benign lesions, given the fact that it can indicate a neoplasm by recognizing a previously undetected hypervascularization, thus impacting the treatment strategy [31].

Germ cell neoplasia in situ (GCNIS) has an incidence of 9%, while metachronous testicular tumors have approx. 2.5%. Thus, the EAU guidelines have a strong recommendation to perform biopsy of the contralateral testis in patients with a high risk of contralateral GCNIS, consisting of having the volume of testicle less than 12 mL, inferior spermatogenesis or a history of cryptorchidism [1]. Newer studies have shown that microRNA371a-3p could guide in better selecting patients that require surgical biopsies and replace control biopsies following the treatment of germ cell neoplasia in situ [32]. Another strong recommendation is concerning the family members of the patient, who should perform scrotal self-examination in a regular manner, just as other populations at risk should [1,33].

Conclusion

Adults patients diagnosed with cryptorchidism should be carefully investigated, as there is a greater probability of malignancy. Although both orchidopexy and orchidectomy can be performed, depending on the age, patients should be informed about life-long malignancy risks. Still, cases of testicular tumors developed at this level are rare, for instance pure embryonal intraabdominal testicular cancer, but early treatment by surgery and combined with chemotherapy administration can lead to significant cure rates. Intravenous CEUS can be used for assessing an intraabdominal testicular tumor, although additional imaging is necessary. This case emphasizes the need of performing the diagnosis and treatment of cryptorchidism as early as possible and raising awareness of the importance of testicular self - examination.

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