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CASE REPORT

Incidental Diagnosis of a Burned-out Testicular Tumor in a Pediatric Trauma Patient

ABSTRACT

Burned-out testicular tumors are rare in pediatric patients. Patients usually present with metastatic retroperitoneal lymphadenopathy and occult-scar-like calcific lesion in the testis. We report a 16-year-old male patient who presented to the emergency department with abdominal pain after blunt trauma to the epigastric region. An abdominal ultrasound (US) performed to rule out solid organ injury revealed incidental necrotic retroperitoneal lymphadenopathy and right paratracheal nodular opacities on posteroanterior chest radiography (PACR). A scrotal US performed to rule out a possible primary testicular neoplastic process showed a subcentimetric irregularly contoured calcified lesion with scattered microcalcifications in the right testicle. Biochemistry tests revealed elevated levels of alpha-fetoprotein, lactate dehydrogenase and ß-human chorionic gonadotropin. Differential diagnosis considered a burned-out testicular tumor and metastatic lymphatic spread. A biopsy of abdominal lymph nodes confirmed the diagnosis of a non-seminomatous germ cell tumor. When incidental retroperitoneal lymphadenopathy is detected during an abdominal ultrasound, including a testicular neoplastic process in the differential diagnosis and conducting a simultaneous scrotal ultrasound can help reduce delays in diagnosis and treatment.

Keywords: Burned-out testicular tumor, lymphadenopathy, retroperitoneal necrotic, ultrasound

Burned-out testicular tumors are extremely rare in pediatric patients, constituting approximately 1-2% of all pediatric malignancies (1). Patients usually present to the clinic with symptoms of metastasis before any testicular complaints, making it difficult to identify the testis as the primary source. This case report aims to present a burned-out testicular tumor detected in a patient with abdominal pain after blunt trauma to the abdomen.

CASE REPORT

A 16-year-old male presented to our emergency department with abdominal pain following blunt trauma to the epigastric region. Abdominal US and PACR were performed to rule out solid organ injury secondary to blunt trauma. Abdominal US examination revealed multiple retroperitoneal lymphadenopathies, the largest measuring approximately 75x55 mm, with a conglomerated appearance and cystic areas compatible with necrosis (Fig. 1). Nodular opacities were detected in the right paratracheal region on PACR (Fig. 2), and a diagnostic scrotal US examination was performed. The patient's history indicated that there were no scrotal complaints. On scrotal examination, an irregularly contoured calcified lesion measuring 5.5 mm in diameter with a minimal hypoechoic edema area around it was detected in the right testicle. Furthermore, multiple microcalcifications were observed in the parenchyma of the right testicle (Fig. 3). Contrast-enhanced thoracic and abdominal CT scans were ordered to assess the extent of the disease. Thoracic CT scan revealed nodular lymphadenopathies in the right paratracheal area with a diameter of 32 mm and heterogeneous contrast enhancement (Fig. 4). Abdominal CT revealed multiple conglomerated lymphadenopathies in the retroperitoneal area, the largest measuring 5 cm in diameter with largely necrotic internal structures. These lymphadenopathies obliterated the intermediate fat plane with the aorta and compressed the inferior vena cava (Fig. 5). These findings were suggestive of metastatic lymphadenopathy secondary to a primary testicular tumor. Laboratory results indicated elevated levels of alpha-fetopro-

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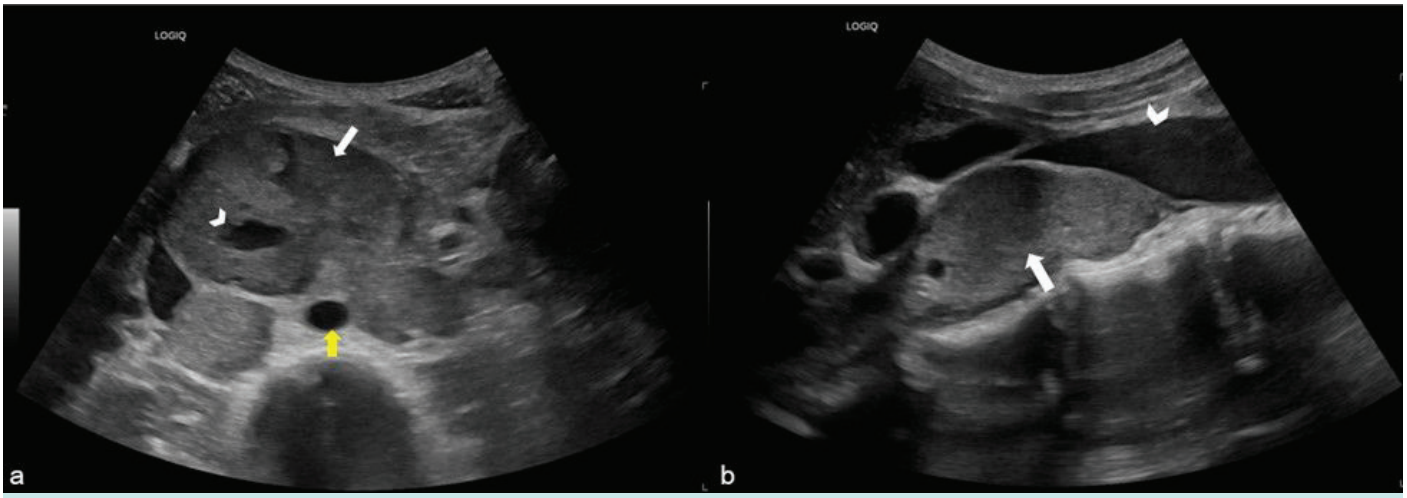

Figure 1. An axial section US examination (a) shows conglomerated lymphadenopathies with cystic/necrotic areas (white arrow) in the retroperitoneal area. These lymphadenopathies are in close proximity to the aorta (yellow arrow). A sagittal section US examination (b) reveals that the conglomerated lymphadenopathies (white arrow) in the retroperitoneal area arch over the wall of the inferior vena cava (stripe) and narrow its lumen.

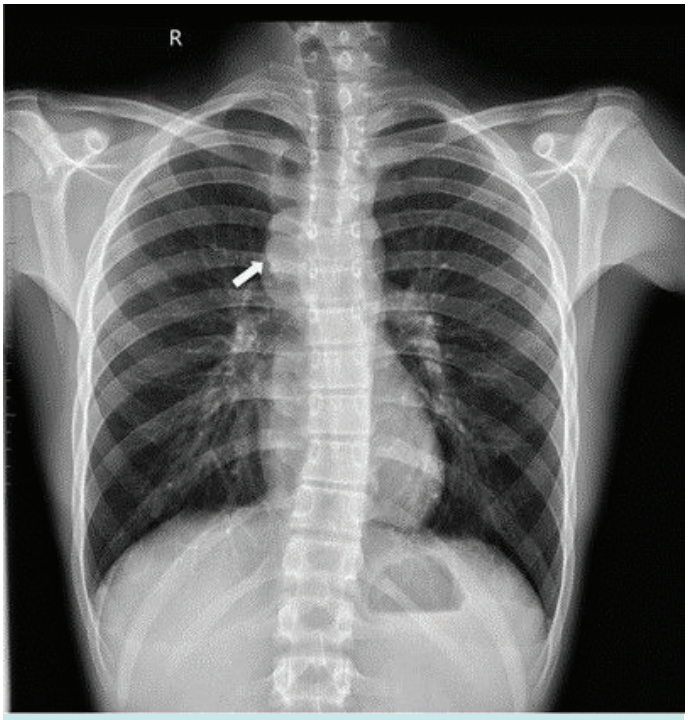

Figure 2. Posteroanterior chest radiograph shows a nodular opacity with smooth contour in the right paratracheal area (white arrow).

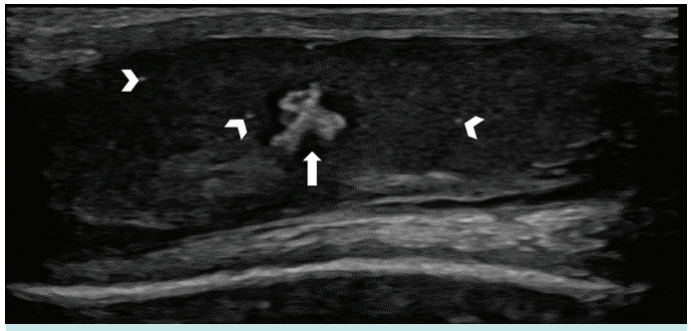

Figure 3. The scrotal US image reveals an amorphous calcified scar-like lesion measuring 5.5 mm in diameter in the central part of the right testis, accompanied by a hypoechoic halo on the periphery indicative of minimal edema (white arrow). Additionally, numerous microcalcifications are present in the testicular parenchyma (stripes).

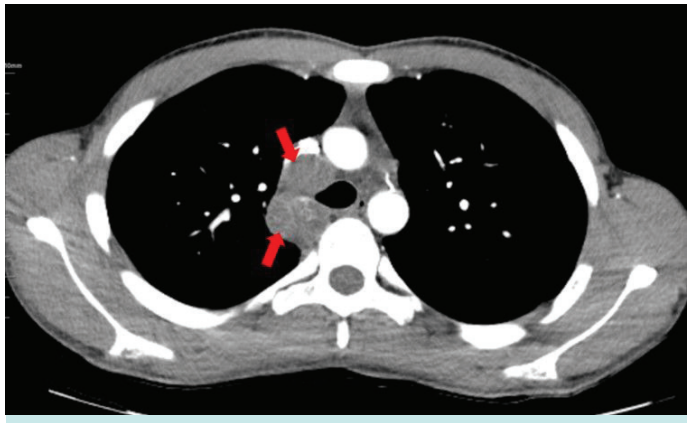

Figure 4. Contrast-enhanced axial thoracic computed tomography (CT) image shows several lymphadenopathies in the right paratracheal area, the largest of which is 32x31 mm in size, showing heterogeneous contrast enhancement (red arrows).

tein (AFP): 15354 µg/L, lactate dehydrogenase (LDH): 397 U/L, and ß-human chorionic gonadotropin (ß-hCG): 14.4 IU/L. Pathological examination of consecutive Tru-Cut biopsies from the retroperitoneal lymphadenopathies in the abdomen revealed a non-seminomatous germ cell yolk sac tumor.

The treatment protocol for the patient was determined by the decision of a multidisciplinary board to include a combination of chemotherapeutic agents bleomycin, cisplatin, and etoposide, along with orchiectomy for the pathological testicle. The patient was

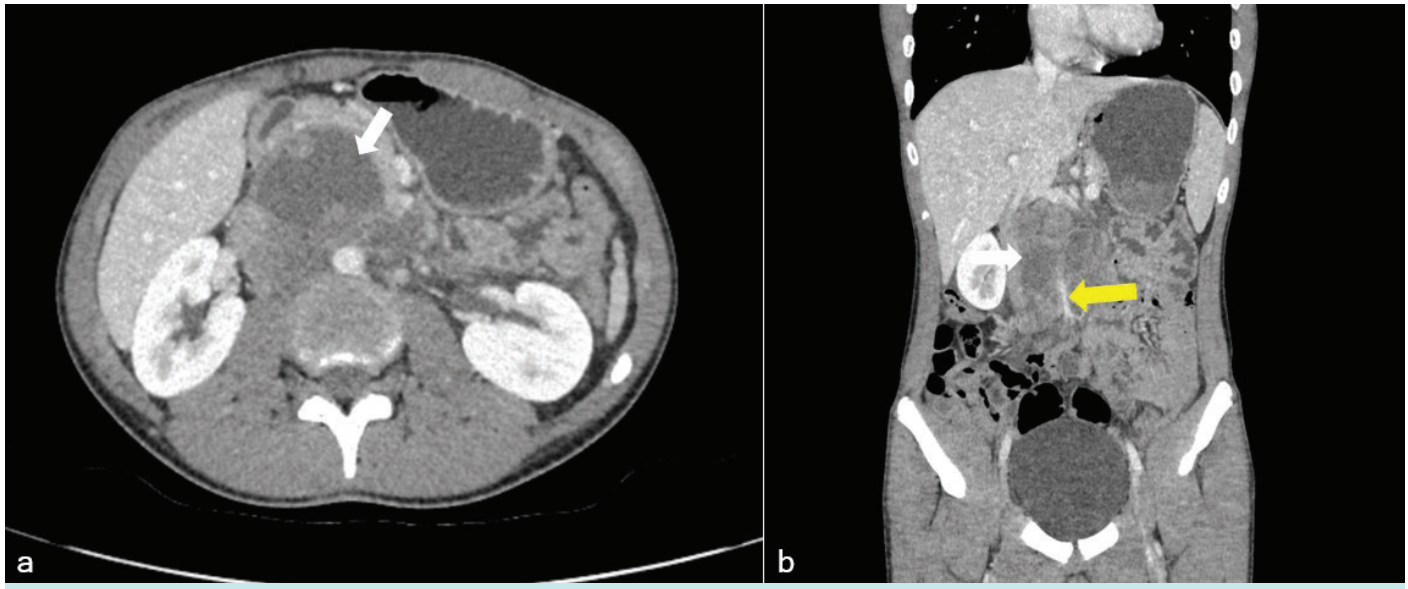

Figure 5. Contrast-enhanced axial section (a) abdominal CT image reveals largely necrotic conglomerated lymphadenopathies (indicated by a white arrow) with obliteration of the aorta and the intermediate fat plane. The contrast-enhanced coronal section (b) abdominal CT image demonstrates the craniocaudal extension of the necrotic conglomerated lymphadenopathies (white arrow) and their close proximity to the superior mesenteric artery (yellow arrow).

initially treated with chemotherapy. Upon completion of the chemotherapy regimen, a multidisciplinary board will evaluate both the abdominal lymphadenopathy and the testis to determine the appropriate surgical approach.

DISCUSSION

Approximately 60% of mixed germ cell subtypes of testicular tumors present as advanced stage cases. Extratesticular dissemination is most commonly manifested as lymphadenopathy in the retroperitoneal region. In advanced cases, metastasis to mediastinal and supraclavicular lymph nodes is commonly observed, with less frequent involvement of the lungs and liver (2,3).

The term "burned-out" testicular tumor is a rarer entity in germ cell testicular tumors. This term refers to the microscopic partial or complete regression of the primary lesion in the testis following metastasis. It is frequently associated with testicular parenchymal atrophy and the presence of microcalcifications. The pathophysiological mechanisms underlying this phenomenon have not been thoroughly elucidated in the literature. Two distinct hypotheses have been proposed. The first hypothesis suggests that ischemia develops in the tumor as a result of the patient's immune response or the overactive metabolism of the tumor; the second hypothesis posits the emergence of a germ cell tumor in an extragonadal region (4,5). In certain cases, testicular space-occupying lesions may not be detectable through imaging modalities.

The majority of cases present to the hospital with symptoms such as abdominal pain, palpable abdominal mass, early satiety, and dyspnea, all of which are caused by metastatic processes. Less commonly, patients may present with complaints of testicular pain and palpable swelling. Occasionally, it may be detected incidentally, as observed in our case. The levels of AFP, ß-hCG, and LDH in blood markers vary according to the subtype of the germ cell tumor. In such cases, US is primarily preferred as an imaging method. The use of high-frequency probes in scrotal US examinations is particularly important for both the detection of lesions and the demonstration of microcalcifications. The scar-like lesion and microlithiasis observed in the testis are recognized as specific findings indicative of a burned-out testicular tumor (6). CT examination is frequently utilized in these cases to assess the extent of the disease. Magnetic resonance imaging (MRI) is generally not preferred. Diagnosis is typically made histopathologically through biopsy of metastatic lesions.

In the treatment of the disease, orchiectomy is performed on the testis where the lesion is located. Burned-out testicular tumors respond to more aggressive chemotherapy regimens compared to primary testicular tumors. Therefore, a combination of chemotherapeutic agents such as vincristine, cyclophosphamide, dactinomycin, bleomycin, cisplatin and etoposide is required (7,8). Extragonadal radiotherapy may be necessary for non-seminomatous tumors (9).

CONCLUSION

Pediatric germ cell tumors may rarely present as burned-out tumors in which the primary testicular lesion is not clinically and radiologically evident but shows nodal metastases. In these cases, testicular occult focus should be kept in mind among the differential diagnoses in the presence of retroperitoneal lymphadenopathy detected incidentally during abdominal ultrasound examination and scrotal ultrasound examination should be added to the examination. Early detection of burned out tumor will prevent delays in diagnosis and treatment.

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