Case Report

ISSN 2465-8243(Print) / ISSN: 2465-8510(Online)
https://doi.org/10.14777/uti.2022.17.2.50
Urogenit Tract Infect 2022;17(2):50-52

An Unusual Case of Testicular Seminoma Mimicking Segmental Testicular Infarction

Young-Joo Kim

Department of Urology, Jeju National University School of Medicine, Jeju, Korea

Seminoma is the most common testicular tumor that commonly presents as a solid mass without pain. It generally shows high blood flow on Doppler ultrasonography (US). We report an atypical case of a painful testicular seminoma without vascularity on Doppler US that could be misdiagnosed as a segmental testicular infarction due to testicular torsion or epididymo-orchitis.

Keywords: Testis; Seminoma; Infarction; Ultrasonography

Received: 4 August, 2022
Revised: 17 August, 2022
Accepted: 17 August, 2022

Correspondence to: Young-Joo Kim
https://orcid.org/0000-0001-5580-4338
Department of Urology, Jeju National University School of Medicine, 102 Jejudaehak-ro, Jeju 63243, Korea
Tel: +82-64-717-1760, Fax: +82-64-717-1131
E-mail: kurology@jejunu.ac.kr

Seminoma is the most common type of testicular neoplasm. Generally, seminoma is a palpable non-tender solid mass and reveals increased vascularity compared with the adjacent normal testis on Doppler ultrasonography (US) [1]. Segmental testicular infarction (STI) is a rare condition. The etiology of STI is uncertain, but arterial vascular obstruction owing to venous thrombosis is believed to be one of the probable causes. Similar to the seminoma, STI commonly occurs between the third and fourth decade of life [2]. The most common symptom of STI is acute testicular pain. On an US, STI appears as a lesion of low echogenicity, and the Doppler US shows noticeably low or absent vascularity [2]. We report a case of an unusual presentation of painful testicular seminoma without vascularity observed on the Doppler US image, mimicking STI with pain due to testicular torsion or epididymo-orchitis.

CASE REPORT

A 13-year-old male visited the emergency department with a complaint of severe pain in the right testis. The patient had no trauma or past medical history. Laboratory tests revealed high C-reactive protein levels at 139.21 mg/L. The complete blood cell count, creatinine, and urinalysis were within the normal range. Our initial diagnostic suspicion was testicular torsion or acute epididymitis. To confirm the diagnosis, a scrotal US was performed, which revealed an approximately 3 cm-sized central mass with heterogeneous hypo-echogenicity in the right testis. However, the color Doppler US showed no vascularity at the lesion, and the remaining testis showed normal echogenicity and blood flow (Fig. 1A). Based on the clinical presentation and the US, segmental testicular infarction (STI) resulting from testicular torsion was suspected. But STI is an uncommon diagnosis and testicular lesions showed inhomogeneous shapes resembling testicular neoplasm. It appeared to be an unusual testicular neoplasm, rather than a torsion with infarction. Further evaluation was done through magnetic resonance imaging (MRI). The MRI showed a 3.2×2.8 cm sized well-defined oval mass within the right testis. The MRI showed a high signal intensity (SI) on both, the T2-weighted image (T2WI) and T1-weighted image (T1WI), and a peripheral dark SI rim on the T2WI but showed a poorly enhanced lesion rather than a hemorrhagic infarction with enhanced small rim foci at the periphery. A possible diagnosis of hematoma or hemorrhagic tumor was

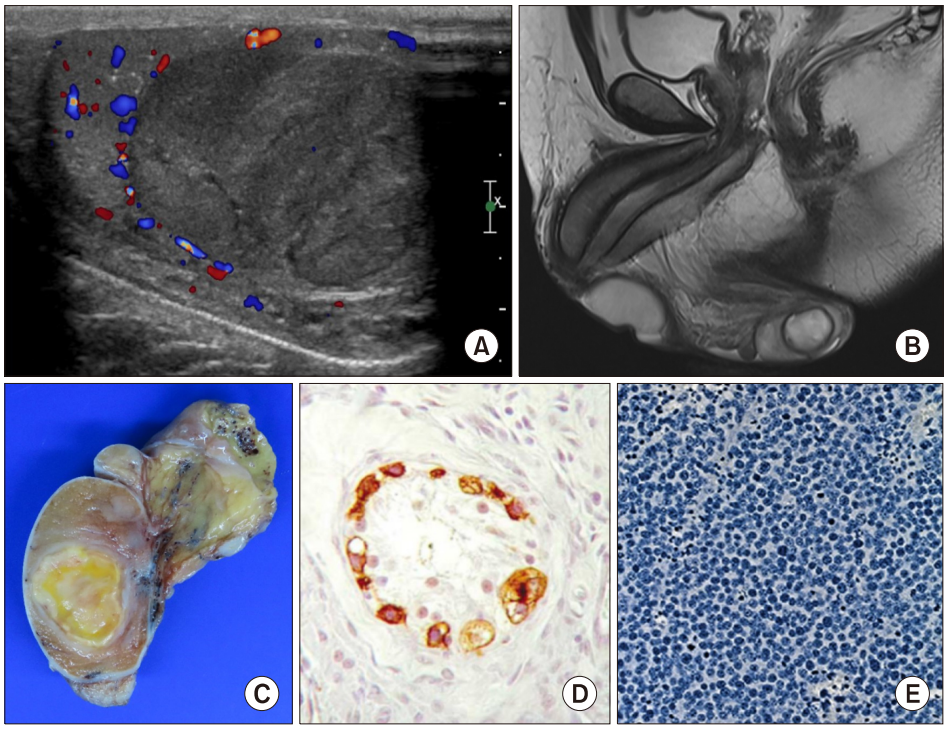

Fig. 1. (A) The scrotal ultrasonography showed an approximately 3 cm-sized central mass without vascularity at the right testicular lesion. (B) Magnetic resonance imaging showed an approximately 3.2×2.8 cm sized well-defined oval mass with a poorly enhanced lesion within the right testis. (C) The gross pathology demonstrated a yellowish mass with necrosis. (D) Immunohistochemical staining was positive for C-kit (×400). (E) Immunohistochemical staining was negative for CD30 (×100).

considered (Fig. 1B). Tumor markers such as lactate dehydrogenase (LDH, 216 U/L), beta-human chorionic gonadotrophin (β-HCG, <0.1 mIU/ml), and alpha-fetoprotein (AFP, <2.00 ng/ml) were all within the normal range. We suspected a testicular tumor rather than STI. Radical orchiectomy was carried out. The operative findings revealed no signs of testicular torsion. The gross pathology showed a yellowish mass with about 90% necrotic area in the center (Fig. 1C). Immunohistochemical staining for c-KIT was positive (Fig. 1D) and negative for AFP and CD30 (Fig. 1E). Based on the above, we arrived at a confirmed diagnosis of testicular seminoma with wide hemorrhagic infarction. Abdomen and chest computerized tomography scans revealed no definite evidence of metastasis. The staging of the right testicular seminoma was done and was found to be stage IA and pT1aN0M0S0. The patient did not undergo chemotherapy after the radical orchiectomy. During the 12-month follow-up examination, the patient presented no symptoms, and no recurrence was detected in imaging and routine follow-up examinations.

This study was approved by the Institutional Review Board of the Jeju National University Hospital (IRB no. JEJUNUH 2022-07-003). Written informed consent was obtained from the parents.

DISCUSSION

Seminoma is the most common malignant testicular neoplasm. It typically manifests as a non-tender solid mass. Compared to the normal testis, seminomas are more hypoechoic when seen on an US, with increased blood flow compared to the normal testis on Doppler US [2]. STI is a rare disease, with an uncertain etiology, but arterial vascular obstruction owing to venous thromboembolism is regarded as one of the most probable causes. The differential diagnosis of STI is hematoma of the testis, infection, sarcoidosis, lymphoma, and testicular tumors, especially seminoma. On the US, STI appears as segmental or lobulated hypoechoic lesions without vascularity. Hypoechoic areas with low vascularity on the Doppler US are often misdiagnosed as testicular tumors [3]. An intra-testicular avascular low echogenic lesion on the Doppler US with pain is commonly diagnosed as an atypical testicular infarction resulting from testicular torsion. It is often managed conservatively owing to misdiagnosis, even though radical orchiectomy would be needed if the diagnosis was testicular cancer. The advances in Doppler US help to discriminate between malignant lesions and STIs, as tumors commonly show high vascularity. Usually, when the Doppler US reveals an absence of testicular vascularity with testicular pain, there is a high

possibility that it would be diagnosed as testicular torsion. According to reports, the Doppler US has a sensitivity above 80% and a specificity above 97% in cases [4]. Our patient presented with severe scrotal pain. Our initial diagnosis was STI, given the absence of central blood flow on the Doppler US. The infarction lesion was homogeneous and spherical on the US. The useful characteristics to distinguish STI from seminoma are noticeably low or absent vascularity on the Doppler US [5]. Also, clinically, STIs generally present with testicular pain, unlike the typical manifestation of seminoma as a painless tumor. STI is a rare condition that may result from complications of epididymitis, testicular torsion, sickle cell anemia, and vasculitis. It has been proposed that venous damage can result in a spherical shape [6]. The MRI is helpful to assess testicular tumors accurately with high sensitivity and specificity. On the MRI, seminomas are seen as multinodular, well-defined, homogeneous tumors of low SI on T2WI. A principal characteristic in seminoma is fibrovascular septa, which show low SI on T2WI and enhance more than the normal tissue on post-contrast T1WI [7]. Tumor markers that are significant for the diagnosis of testicular malignancy include AFP, β-HCG, and LDH. The AFP levels should be within the normal range in seminoma [8]. The gross pathology of seminoma shows a diffuse arrangement of pale to clear cells, while tumor cells typically have a pale cytoplasm with fibro-vascular septa. It most often presents as a well-rounded mass with or without hemorrhagic necrosis. In gross anatomy, a yellowish tumor mass with about 90% infarcted area in the center was seen in our case. Seminoma shows sheets of monotonous cells with pale cytoplasm and large nuclei with intervening thin fibrous septa with hematoxylin-eosin stain [9]. Seminoma demonstrates an immune-reactive response to sal-like protein 4, OCT3/4, c-KIT, and SRY-related HMG-box. CD30 as an epithelial membrane antigen is negative. Stains for AFP are characteristically negative [9]. Our aim in presenting this case study is to prevent the misdiagnosis of testicular seminoma as STI. If testicular seminoma is suspected, radical orchiectomy is unavoidable. It is important to prevent medical treatment errors due to a misdiagnosis. Outlining the correct treatment plan for patients with testicular seminomas can be helpful to prevent misdiagnosis. In conclusion, when a painful testicular disease demonstrates a segmental lesion without vascularity on the Doppler US, both STI resulting from testicular torsion and testicular cancer should be taken into consideration for the differential diagnosis. Additional diagnostic impressions such as unusual characteristics of malignancy would be helpful for an accurate diagnosis.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

ACKNOWLEDGMENTS

This work was supported by the 2022 education, research, and student guidance grant funded by the Jeju National University.

REFERENCES

1. Aganovic L, Cassidy F. Imaging of the scrotum. Radiol Clin North Am 2012;50:1145-65.
2. Elifranji M, Elawad A, Stafrace S, Salle JLP, Vallasciani S. Segmental testicular infarction associated to torsion: first case report in childhood. Urology 2021;149:227-9.
3. Marko J, Wolfman DJ, Aubin AL, Sesterhenn IA. Testicular seminoma and its mimics: from the radiologic pathology archives. Radiographics 2017;37:1085-98.
4. Liang T, Metcalfe P, Sevcik W, Noga M. Retrospective review of diagnosis and treatment in children presenting to the pediatric department with acute scrotum. AJR Am J Roentgenol 2013; 200:W444-9.
5. Saxon P, Badler RL, Desser TS, Tublin ME, Katz DS. Segmental testicular infarction: report of seven new cases and literature review. Emerg Radiol 2012;19:217-23.
6. Aquino M, Nghiem H, Jafri SZ, Schwartz J, Malhotra R, Amin M. Segmental testicular infarction: sonographic findings and pathologic correlation. J Ultrasound Med 2013;32:365-72.
7. Tsili AC, Tsampoulas C, Giannakopoulos X, Stefanou D, Alamanos Y, Sofikitis N, et al. MRI in the histologic characterization of testicular neoplasms. AJR Am J Roentgenol 2007;189:W331-7.
8. Stevenson SM, Lowrance WT. Epidemiology and diagnosis of testis cancer. Urol Clin North Am 2015;42:269-75.
9. Howitt BE, Berney DM. Tumors of the testis: morphologic features and molecular alterations. Surg Pathol Clin 2015;8: 687-716.