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METASTATIC TESTICULAR GERM CELL TUMOR PRESENTING WITH ABDOMINAL PAIN: CT AND MRI FINDINGS

E. Ozan[1], O. Oztekin[1], Z. Kozacioglu[2], H. Postaci[3], Z.H. Adibelli[1]

Testicular tumors are the most common solid tumors in young adult males. Patients with testicular tumor often present with painless scrotal mass. Rarely, symptoms are related to metastases. We describe the case of a patient presenting with abdominal pain due to retroperitoneal lymphadenopathy. We describe the magnetic resonance imaging findings of lumbar spine osseous metastasis.

Key-word: Testis, neoplasms.

Testicular cancer, although representing 1% of all malignancies in men, is the most common neoplasm in boys and young adults from 15 to 34 years old (1). Ninety-five percent of testicular carcinomas are germ cell tumors (GCTs) arising from the germinal epithelium of the seminiferous tubules (2). Testicular GCT most commonly presents as a painless palpable mass (up to 95% of cases) (3). In up to 10% of cases, it may present with dull scrotal ache, pain or acute fever (4). In patients with retroperitoneal metastases or disseminated disease, backache, malaise, lethargy and other systemic features may be the presenting findings (5). We describe here a case in which the initial complaint was abdominal pain. In this way, we emphasize the relationship between a retroperitoneal mass and testicular tumor. We also present both conventional and diffusion-weighted magnetic resonance imaging (MRI) findings of bone metastasis in this case and discuss the value of skeletal MRI in patients with metastatic testicular GCT.

Case report

A 28-year-old-man presented with abdominal pain. An abdominal ultrasound (US) was performed and a retroperitoneal mass measuring 8.5 cm was found. Abdominal computed tomography (CT) showed a large retroperitoneal lobulated soft-tissue mass surrounding the aorta and displacing the inferior vena cava (IVC), right and left renal veins (Fig. 1). Thoracic CT demonstrated several lesions on right lung with the largest one having a diameter of 3 cm. As abdominal and thoracic CT findings raised a suspicion of metastases, a scrotal ultrasound was performed and heterogeneous echotexture throughout the left testicle was demonstrated. Elevated tumor marker levels were measured: human chorionic gonadotropin (β-HCG), > 100000 mIU/ml (normal range, 0-5 mIU/ml); -fetoprotein (AFP), 475 ng/ml (normal range, 0-5,8 ng/ml); lactate dehydrogenase (LDH), 1294 U/l (normal range, 230-460 U/l). The patient underwent left orchidectomy and pathologic examination revealed mixed nonseminomatous germ cell tumor composed of teratocarcinoma and yolk sac tumor. The patient received etoposide and cisplatin combined therapy as the first-line chemotherapy. After 4 courses of treatment, he complained of backpain. Abdominal CT showed destructive lytic lesion of T12-L1 vertebral bodies, secondary infiltration of left paraspinal and psoas muscles and also size reduction of the paraortic lymphadenopathy (Fig. 2A). Conventional MRI confirmed aggressive vertebral metastasis and defined the extention of the lesion. In axial images infiltration of left paraspinal and psoas muscles, involvement of dural sac and left neural foramen were obvious (Fig. 3A, B, C). On diffusion-weighted MRI obtained with a b value of 300 sec/mm^2, vertebral bodies and paraspinal muscles demonstrated high signal intensities revealing pathologic fractures (Fig. 3D). Afterwards, the patient received

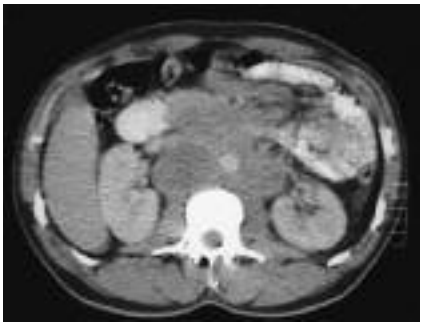

Fig. 1. — Abdominal CT shows a large retroperitoneal lobulated soft-tissue mass surrounding the aorta and displacing the inferior vena cava, right and left renal veins.

2 courses of etoposide and cisplatin therapy as the second-line chemotherapy. After six courses of chemotherapy, tumor marker levels have decreased (AFP, 3 ng/ml; -HCG, 53.97 mIU/ml). A surgical intervention for lumbar spine osseous metastasis is being scheduled.

Discussion

The most common symptom at the time of the diagnosis in patients with testicular tumor is painless swelling of the testis (6). Metastasis to lymph nodes can show itself as symptoms due to the mass effects in the retroperitoneal region, abdominal pain as well as the enlargement of the supraclavicular, axillar and even the cervical lymph nodes (7). Lymphoproliferative diseases and metastases should be considered when paraortic lymphadenopathy is detected on abdominal ultrasound or computed tomography. Paraortic lymphadenopathy in a male patient can indicate the presence of a testicular tumor, so that testicular US examination is of a diagnostic value.

Testicular tumors spread by the lymphatic route through channels that accompany testicular vessels to

From: Department of 1. Radiology, 2. Urology; 3. Pathology; Izmir Education and Research Hospital, Izmir, Turkey.
Address for correspondence: Dr E. Ozan, M.D., Department of Radiology; Izmir Education and Research Hospital, Saim Cıkrıkcı Cad. No: 59 Bozyaka, Izmir, Turkey.
E-mail: ebrozan@yahoo.com.tr

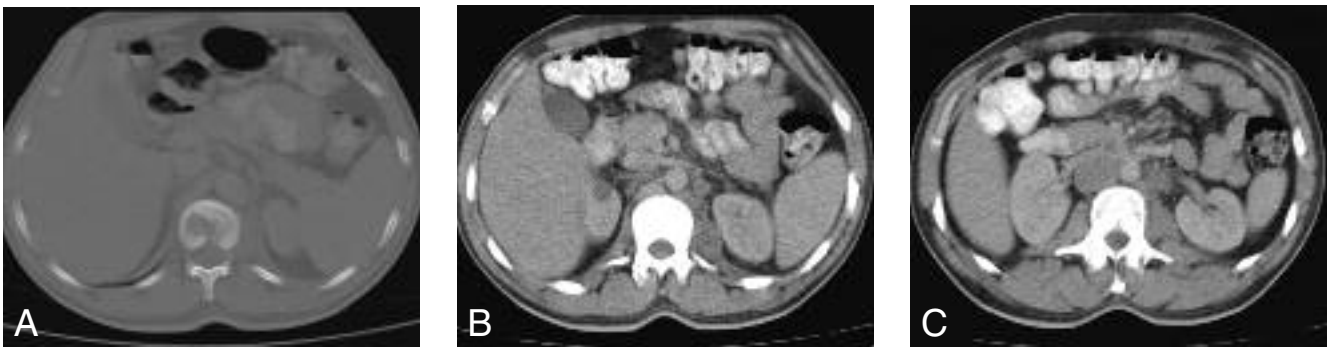

Fig. 2. — Abdominal CT shows destructive lytic lesion of T12-L1 vertebral bodies, secondary infiltration of left paraspinal and psoas muscles and size reduction of the paraortic lymphadenopathy.

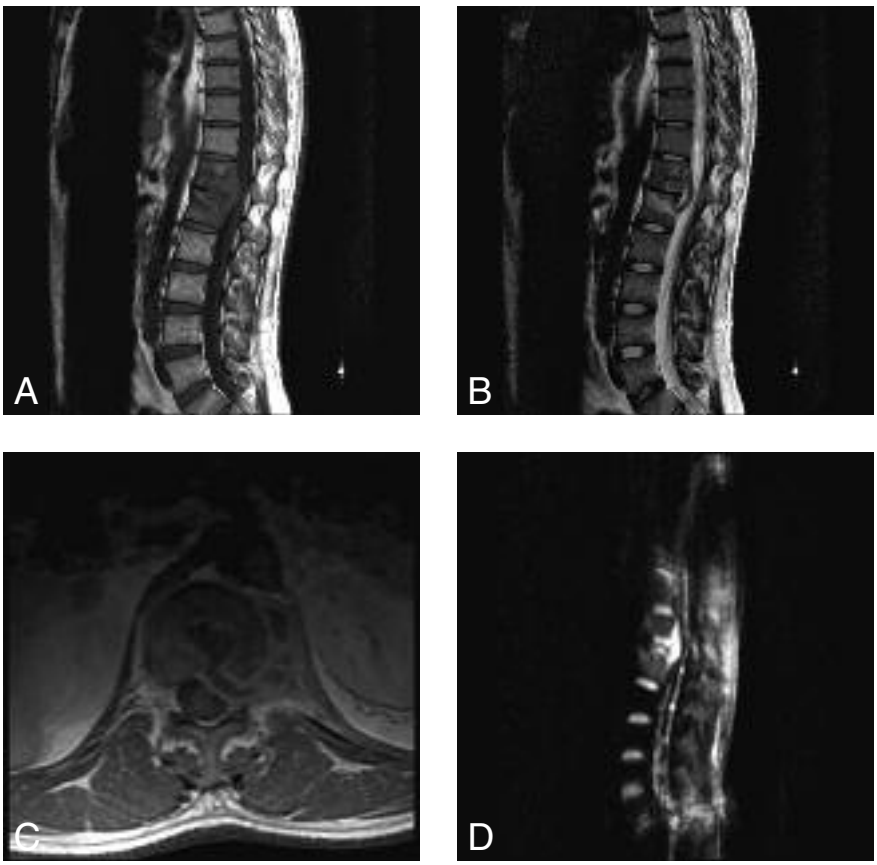

Fig. 3. — A: Sagittal T1-weighted MRI (TR/TE 600/17) shows low signal intensity metastatic lesion on both T12 and L1 vertebrae. B: Sagittal T2-weighted MRI (TR/TE 3446/130) shows high signal intensity metastatic lesion involving superior part and extension into the posterior part of T12 and L1 vertebrae. C: Contrast-enhanced axial T1-weighted MRI shows contrast enhancement in the metastatic lesion, invasion of left paraspinal and psoas muscles, involvement of the dural sac and left neural foramen. D: Sagittal diffusion-weighted MRI obtained with a b value of 300 sec/mm^2 shows high signal intensity metastatic lesion.

the retroperitoneal lymph nodes (8). Right-sided tumours normally spread to right-sided nodes around the IVC (most commonly lower retroperitoneal, aortocaval or paracaval) and left-sided tumours normally spread to lymph nodes on the left, adjacent to the aorta (most commonly just below the left renal hilum) (9). Hematogenous spread in testicular cancer is predominantly to the lungs, other sites of metastases in patients with advanced aggressive tumors include the brain, bone, and liver (10).

The primary imaging modality currently used for staging disease is computed tomography (CT). Its overall accuracy approaches 80% (11). Current European Germ Cell Cancer Consensus Group (EGCCCG) guidelines state that patients should receive contrast-enhanced CT of thorax, abdomen and pelvis (12). An alternative to CT for staging testicular GCT is MRI. Despite developments in MRI with faster acquisitions, MRI is not routinely used for staging, in part because of its longer examination time, higher cost, and limited availability compared with CT. However, MRI is useful for the detection and characterization of central nervous system disease as well as musculoskeletal and hepatic metastases (8).

Although bone involvement is not uncommonly detected on bone scan (13) and autopsy studies (14), bone deposits of germ cell tumors are not addressed in contemporary reviews on imaging and treatment of skeletal metastases (15, 16), and are covered in current guidelines on diagnostics and treatment of germ cell tumors only by general remarks (12, 17-19). There are no statements on the value of skeletal MRI in the cited guidelines (17-19). MRI is an excellent method for assessing the bone marrow (20). Recently, diffusion methods for vertebral bone marrow have been used and it is reported that diffusion-weighted MRI provides excellent distinction between pathologic and benign vertebral compression fractures (21-23). Our findings in this case underline that back pain in metastatic germ cell tumours is often due to retroperitoneal lymphadenopathy but lumbar spine osseous metastases must be recognized early if severe potential complications, such as spinal cord compression, are to be avoided. In such cases MRI may disclose bone involvement and it is a useful technique for evaluating involvement of dural sac, paraspinal

and psoas muscles. Additionally diffusion-weighted imaging is an important adjunct in the diagnostic workup of malignant vertebral lesion and serves as a unique modality in order to differentiate it from infectious spondylitis and benign vertebral collapse.

In conclusion, testicular tumor should always be considered in the differential diagnosis for paraortic lymphadenopathy of unknown etiology, especially in young male patients presenting with abdominal pain. We believe that imaging procedures are crucial for confirming the presence of disease and assess its extent in patients with testicular GCT, and conventional MRI combined with diffusion-weighted MRI may disclose lumbar spine osseous metastases in these patients.

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