Clinical Case

Bone metastases and spinal cord injury secondary to non-seminomatous testicular tumor


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Abstract

Testicular cancer is the most frequent solid tumor in men between 15 and 35 years of age. Bone metastases associated with spinal cord injury are rare. We present the case of a 28-year-old man whose disease began 4 years prior with enlargement of the right testis. Physical examination revealed a hardened right testis measuring 20 cm. An ultrasound study showed a heterogeneous image and the patient had elevated preoperative levels of the tumor markers, lactate dehydrogenase (LDH) and alpha-fetoprotein (AFP), and bilateral pulmonary and retroperitoneal metastases. Radical orchiectomy revealed a mixed germ cell tumor made up of 70% immature teratoma and 30% endodermal sinuses. In the postoperative period, the patient presented with paraplegia and urinary retention. Tumor activity was documented in the cervical and lumbar spine with complete spinal cord injury. He was managed with steroid treatment and radiotherapy and then with 4 cycles of bleomycin-etoposide-cisplatin (BEP), but had disease progression. One month later he presented with intense pain and was unable to move his left shoulder due to tumor activity in that area, which was managed with radiotherapy. Second-line chemotherapy was not administered and the patient died.

Vertebral metastases derived from testicular tumors can cause epidural compression. Management is based on steroid treatment and radiotherapy and emergency decompression surgery is required to prevent functional loss. The neurologic deficit tends to persist. These tumors are accompanied by bulky metastatic disease and require chemotherapy. Their outcome is poor.

Bone metastases of nonseminomatous testicular tumors can manifest as bone pain or as spinal cord compression symptoms. No cases have been reported in the Mexican medical literature.
Introduction

Testicular cancer is the most frequent solid tumor in men between the ages of 15 and 35 years. Its presentation with metastatic disease is frequent (up to 60% of the nonseminomatous tumors) and it spreads most commonly by means of the lymphatic pathway to the retroperitoneal lymph nodes (70%). However, it can reach other organs, mainly the lungs, liver, and brain. Unlike the majority of urologic cancers, bone metastases from these tumors are rare (< 1%) and symptomatic spinal cord metastases in this context are even rarer. In post-mortem studies of patients that died from testicular tumors, vertebral metastases have been found in up to one-third of them. These metastases must be intentionally looked for through magnetic resonance imaging when there are symptoms of bone pain or neurologic deficit, especially reduced strength or altered sensations.1

Case presentation

A 28-year-old man had a past history of right cryptorchidism and orchidopexy in adolescence. His disease began 4 years prior with an enlarged right testis, progressive deterioration of his general health status, and a 20 Kg weight loss. Physical exploration revealed exertional dyspnea and an approximately 20 cm hardened right testis. A testicular ultrasound study showed a heterogeneous image in the right testis and a normal left testis. Preoperative tumor marker measurement reported lactate dehydrogenase (LDH) 506 U/L, alpha-fetoprotein (AFP) 203 ng/mL, and human chorionic gonadotropin hormone (hCG) 2.83 mIU/mL. A chest x-ray revealed multiple radio-opaque cannonball images in both hemithoraxes and a contrast-enhanced abdominal tomography scan identified intercaval-aortic tumor activity measuring 3 cm (fig. 1). A right radical orchiectomy was performed identifying a mixed germ cell tumor made up of 70% immature teratoma and 30% endodermal sinuses, extensive necrosis, and lymphovascular invasion. There was also spermatic cord invasion (pT3) and postoperative tumor markers were: LDH 176 U/L, AFP 65.5 ng/mL, and hCG 5.2 mIU/mL. The patient presented with progressive weakening of the lower limbs in the immediate postoperative period until developing paraplegia and urinary and fecal retention. Magnetic resonance imaging identified tumor activity in the cervical and lumbar spine that conditioned complete spinal cord injury (fig. 2). The patient was referred to the Instituto Nacional de Cancerología where he was managed with steroid treatment and 8 Gy radiotherapy at the compression sites. After that he received 4 cycles of bleomycin-etoposide-cisplatin (BeP) for clinical stage III-C disease classified as pT3N2M1bS1, but disease progression continued (fig. 3). One month later the patient presented with elevated AFP levels, intense pain, and the inability to move his left shoulder. Tumor activity was identified in the left glenoid region (fig. 4) and the patient was given local 8 Gy radiotherapy at that site. Due to his poor functional status and the added urinary tract and soft tissue infections, a second line treatment of chemotherapy could not be administered and the patient died 6 months after his initial diagnosis.
Vertebral metastases should be ruled out in young men presenting with symptoms of spinal cord compression, including those derived from testicular tumors despite their rarity. Just as in other types of vertebral metastasis, that arising from testicular cancer progresses into epidural compression, resulting in a vertebral body, the most frequent of which is an osteolytic lesion. The study of choice for detecting these lesions is magnetic resonance imaging because it is able to identify small lesions before they affect the cortical cord. It is also useful in determining the degree of involvement of the spinal cord canal that can be missed by plain x-ray or bone scintigram studies.

Acute management of spinal cord injury secondary to vertebral metastases consists of steroids, mainly dexamethasone, followed by radiotherapy. The preferred regimen for patients with poor prognosis is a single fraction of 8 Gy and 30 Gy in 10 fractions, which allows patients with poor functional status to be moved only once in order to receive treatment. The outcome factors influencing the post-treatment result are: the amount of time elapsed between motor symptom onset and radiotherapy, primary tumor histology, the amount of time from cancer diagnosis to the development of symptomatic spinal cord metastases, and the status of the patient before treatment.

These patients usually require decompression surgery, given that the loss of neurologic function is rapid and progressive, and despite treatment, the neurologic deficit tends to persist. The surgical aims include decompression and stabilization. The surgical approach can be anterior, posterior, or combined, taking into account the factors of lesion location, the presence of vertebral and concomitant extravertebral metastases, the functional status of the patient, the type of primary tumor, and the experience of the surgeon. When there are multiple metastases, the
preferred approach is posterior decompression through a transpedicular route accompanied with stabilization. Laminectomy as the only treatment is not recommended because the majority of lesions have an anterior component and this would cause spinal column instability. Radiosurgery is another option for these patients, with the possibility of administering a high radiation dose to the localized tumor using a stereotactic approach.

These types of patients regularly present with bulky metastatic disease and require priority chemotherapy, usually 4 cycles of BEP. Despite multidisciplinary treatment, outcome is poor.

The case presented herein was one of spinal cord injury with the recommended approach of steroid treatment and radiotherapy. However, due to the different factors of vertebral metastasis, spinal cord involvement at more than one point, the rapid development of spinal cord injury after diagnosis, and the poor functional status of the patient, he was not a candidate for surgical decompression, and his neurologic deficit persisted. The patient received 4 cycles of chemotherapy as first line treatment, but presented with disease progression; it was not possible to administer second line treatment due to the development of added infections and functional deterioration. Finally, the patient developed a symptomatic metastatic lesion in the left shoulder, making this case even more unusual.

Conclusions

Bone metastases from germ cell testicular tumors are rare and can manifest as bone pain or even spinal cord compression symptoms when vertebrae are involved. Treatment requires a multidisciplinary approach. There are no reports in the Mexican medical literature on such an association.

Conflict of interest

The authors declare that there is no conflict of interest.

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