A Case of Metastatic Testicular Cancer Complicated by Tumour Lysis Syndrome and Choriocarcinoma Syndrome

Koji Kawai¹, Ei-Ichiro Takaoka¹, Makito Naoi¹, Kensaku Mori², Manabu Minami², Toru Shimazu¹ and Hideyuki Akaza¹

¹Department of Urology and ²Department of Radiology, Institute of Clinical Medicine, University of Tsukuba Graduate School of Comprehensive Human Sciences, Tsukuba, Ibaraki, Japan

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A 26-year-old man was referred to our hospital for treatment of metastatic testicular cancer. The pathological diagnosis was choriocarcinoma with seminoma. Sequential computerized tomography examinations revealed rapidly progressing bulky liver metastases and a lung metastasis. Chemotherapy with bleomycin, etoposide and cisplatin (BEP) was started on the day of admission. Subsequently, the patient suffered from tumour lysis syndrome (TLS) and massive haemorrhage at metastatic sites. The latter complication is also called choriocarcinoma syndrome. To our knowledge, this is the first case report of testicular cancer complicated with both critical conditions. Intensive care and radiological intervention barely prevented a fatal outcome. The urological oncologist should be aware of the potential complications TLS and choriocarcinoma syndrome in cases of rapidly progressive and high-volume choriocarcinoma.

Key words: testicular cancer – tumour lysis syndrome – choriocarcinoma syndrome

INTRODUCTION

Liver metastasis represents an independent, poor-risk prognostic factor in patients with testicular cancer. Several investigators have reported improvement of the outcome by multimodality treatments (1,2), but hepatic involvement itself, along with the biological aggressiveness of the disease, sometimes requires intensive management. Here, we report a case of testicular cancer with multiple liver metastases that showed extremely rapid progression. The patient suffered from life-threatening complications including tumour lysis syndrome (TLS), haemorrhagic manifestations from liver metastases and small bowel infiltration, liver failure and disseminated intravascular coagulation (DIC) during the first course of induction chemotherapy. Intensive medical care and radiological intervention barely prevented a fatal outcome.

CASE

A 26-year-old man complaining of left scrotal swelling underwent a high orchiectomy in a local hospital. The pathology of the left testicular tumour was choriocarcinoma with a seminoma element. Computerized tomography (CT) revealed multiple liver metastases (Fig. 1) and a solitary lung metastasis of 3 cm in diameter. The patient was referred to our hospital for treatment of metastatic disease 11 days after the surgery. Physical examination at admission revealed hepatomegaly and gynecomastia. The LDH level and hCG level had increased markedly to 2070 IU/ml and 2 660 000 IU/ml, respectively. The alpha-fetoprotein level was within normal limits (2 ng/ml). The CT on the admission day revealed hepatomegaly with numerous masses replacing almost the entire liver, as shown in Fig. 2. In contrast, there was no significant change in the lung metastasis.

Because of the aggressive nature of the disease, we started induction chemotherapy with bleomycin, etoposide and cisplatin (BEP) (3) on the day of admission. On the second day (Day 2), the serum UA level had increased to 8.7 mg/dl (normal range < 7 mg/dl), and urinalysis revealed acid urine. Oral allopurinol (300 mg/day) and intravenous sodium bicarbonate were begun under the clinical diagnosis of TLS. However, when blood chemistry on Day 5 showed further elevation of the serum UA level to 9.9 mg/dl and a high serum phosphate level of 6.1 mg/dl (normal range ≤ 7 mg/dl), and urinalysis revealed acid urine, the allopurinol dose was increased to 600 mg/day.

Oral allopurinol (300 mg/day) and intravenous sodium bicarbonate were begun under the clinical diagnosis of TLS. Since blood chemistry on Day 5 showed further elevation of the serum UA level to 9.9 mg/dl and a high serum phosphate level of 6.1 mg/dl (normal range ≤ 7 mg/dl), and urinalysis revealed acid urine, the allopurinol dose was increased to 600 mg/day. During the following days, the biochemical markers returned to normal levels. Although the transient and mild elevation of serum creatinine level, which peaked on Day 5 at 1.21 mg/dl (normal range < 1.1 mg/dl), was noticed, the development of renal failure was successfully avoided.

Together with the metabolic derangements, the patient suffered from several complications. On Day 2, the patient complained of acute and transient abdominal pain. Since the symptoms were accompanied by progression of anaemia, we...
suspected intraperitoneal haemorrhage from the liver metastases. In addition, massive melena developed on Day 4. Both upper gastrointestinal endoscopy and colonoscopy failed to detect the origin of the melena, but the angiography revealed irregular staining with extravasation originating from branches of the ileal artery (Fig. 3). Since the findings suggested tumour infiltration to the small bowel, the region was considered to be responsible for the melena, and embolization with gelfoam was performed. Despite the successful control of the melena, the anaemia progressed further. The repeated episodes of abdominal pain and accumulation of massive ascites made us suspect considerable bleeding from liver metastases. Although the bleeding point could not be identified by hepatic angiography, selective embolization of the left hepatic artery with gelfoam was performed. This procedure achieved good control of the bleeding. The subsequently developed DIC and liver failure required further intensive care, but the patient retained an almost stable general condition. The blood cell count and blood chemistry tests were normalized, except for mild hyperbilirubinaemia, and the second cycle of BEP was started on Day 22. The patient received three cycles of BEP, followed by four cycles of combination chemotherapy with paclitaxel, ifosfamide and cisplatin (TIP) (4). The clinical course was uneventful, and all tumour markers normalized after the chemotherapy. The CT demonstrated marked reduction of the liver metastases (Fig. 4). The patient underwent thoracotomy for the residual lung metastasis. Since the histology of the residual lung metastasis revealed necrosis, further chemotherapy was not indicated. The patient has remained well and is without evidence of disease 8 months after the last chemotherapy.

DISCUSSION

We present the clinical course of a testicular cancer patient with rapidly progressing liver metastases who suffered from TLS and haemorrhage at the sites of the metastases. To our knowledge, this is the first case report of testicular cancer complicated with both critical conditions. The patient was
successfully managed with intensive supportive care and radiological intervention.

First, TLS is an oncological emergency that may occur during chemotherapy for highly chemo-sensitive malignancies (5). The release of intracellular substances accompanying extensive tumour cell death is considered to be the cause of this syndrome. In many cases, it occurs within 48 h from the start of chemotherapy (5). The TLS patient may develop hyperuricaemia, hyperkalaemia, hyperphosphataemia, and hypocalcaemia. The production and excretion of a high volume of uric acid causes the deposition of uric acid crystals in the collecting ducts, which results in the development of uric acid nephropathy. Also, the hyperphosphataemia causes deposition of calcium phosphate, and can promote renal failure. Therefore, the primary aim of the treatment of TLS is prevention of hyperuricaemia and adequate systemic hydration. Testicular cancer is a rapidly growing, chemotherapy-sensitive cancer that seems to have high risk for development of TLS, but to our knowledge, only four germ cell cancer cases with TLS were reported in the literature in English (6–9).

Secondly, the patient suffered from repeated haemorrhages from liver metastases. Logothetis (10) has described haemorrhage at the site of metastases in advanced germ cell cancer containing high-volume choriocarcinomatous elements. This was termed ‘choriocarcinoma syndrome’. Acute pulmonary haemorrhage is the most frequent manifestation; however, haemorrhage at any site of metastasis can develop (11). In the present case, the extremely high serum hCG level suggested that choriocarcinoma was the dominant element of metastatic sites. The patient also suffered from repeated and massive melena. The arteriography revealed that neoplastic vessels originated from branches of the ileal artery. Although the tumour was not detected by CT, angiographic findings supported the presence of infiltration of choriocarcinoma rather than small bowel angiodysplasia. Although small bowel metastasis from testicular cancer is rare, there are five case reports of small bowel metastases from genital choriocarcinoma, teratocarcinoma and retroperitoneal choriocarcinoma (12). In the present case, pulmonary haemorrhage, the typical presentation of choriocarcinoma syndrome, was not revealed. This might be due to small tumour volume in the lung metastasis (3 cm in diameter, solitary) in our case.

In conclusion, the present case indicates that TLS, although rare, is a possible and treatable complication of chemotherapy for testicular cancer. The rapid progression of choriocarcinoma metastases is considered to have contributed to the onset of the critical complications in this case. Prompt chemotherapy before orchiectomy would have been a better choice for this patient, but this option was not selected because no life-threatening metastases were noticed at the initial presentation. The urological oncologist should be aware of the potential complications presented here, TLS and choriocarcinoma syndrome, in the treatment of testicular cancer with rapidly progressive and high-volume choriocarcinoma.

References