CASE REPORT

Acute cord compression secondary to spinal relapse of testicular seminomas

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SUMMARY

This is the first-reported case of an isolated thoracic spine relapse of a stage 1 testicular seminoma more than 1 year after surgery and radiotherapy. We report a 38-year-old gentleman, who underwent radical orchidectomy and adjuvant retroperitoneal irradiation for a pure testicular seminoma, presenting with acute cord compression from an isolated T8 relapse 14 months after the index surgery. Decompressive laminectomy with instrumentation was performed with adjuvant chemoradiotherapy. The patient gained full neurological recovery and has remained disease-free for 4 years. Testicular seminomas rarely relapse in the spine after treatment with surgery and radiotherapy, and it is usually the lumbar spine that is involved. Spinal relapse also commonly presents with pain rather than acute cord compression. This case report discusses the unique behaviour of testicular seminomas and their presentation in vertebral relapse. We also present a summary of the available literature on isolated thoracic spine relapse of testicular seminomas.

BACKGROUND

Testicular seminomas are among the most treatable cancers in the oncologic literature, with cure rates in excess of 90%.¹ Management of a stage 1 testicular seminoma typically involves surgery, followed by active surveillance, radiotherapy or chemotherapy. Multiple large-scale randomised controlled trials have shown a 5-year relapse-free survival of more than 95% in patients with stage 1 seminomas treated with radical inguinal orchidectomy followed by radiotherapy.^{2–4} Cancer recurrence in this group of patients usually occurs in the para-aortic lymph nodes and the lungs. Bony metastases of germ cell tumours are uncommon, with an incidence rate of around 5%,⁵ and the culprits are frequently advanced nonseminomatous germ cell tumours.

We present a rare case of acute spinal cord compression secondary to an isolated T8 vertebral metastasis of a stage 1 pure testicular seminoma that had been previously treated with surgery and irradiation.

CASE PRESENTATION

A 38-year-old gentleman with a history of left-sided testicular maldescent presented to the urology department with a recent, painless right testicular swelling in January 2008. Perioperative staging chest radiographs and CT scan of the abdomen and pelvis were unremarkable with no evidence of metastatic disease. Serum tumour markers (lactate

dehydrogenase, α -fetoprotein, β -human chorionic gonadotropin) were also within the normal range.

An elective right inguinal radical orchidectomy was performed and histological examination revealed a 7.5 × 6 × 4 cm, stage 1 classical seminoma with no involvement of the rete testis, spermatic cord, tunica albuginea or lymphovascular structures. A left testicular biopsy done at the same setting was normal. Adjuvant retroperitoneal irradiation at a total dose of 20 Gy in 10 fractions was given postoperatively.

In a follow-up review 6 months postoperatively, the patient was clinically well with normal levels of serum tumour markers. He subsequently lost to follow-up.

In March 2009, this patient came to the emergency department for acute-onset bilateral lower limb weakness and numbness, associated with acute retention of urine. Clinically, there was diminished sensation from the spinal level of T10 and power in bilateral lower limbs was grade 3 on the Medical Research Council (MRC) scale. The patient's bilateral lower limb reflexes were brisk and his anal tone was also lax.

INVESTIGATIONS

An urgent MRI of his thoracic and lumbar spine confirmed a soft tissue mass replacing the T8 vertebra with an intraspinal, extradural extension from T7 to T8, causing anterolateral cord displacement with consequent focal cord myelomalacia. This is

Figure 1 Axial slice of the T1-weighted MRI at a level of T8 showing tumour encroachment into the spinal canal causing indentation of the thecal sac and cord compression.

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Figure 2 Sagittal slice of the T2-weighted MRI showing complete obliteration of cerebrospinal fluid around the spinal cord by space occupying lesions at the level T8.

clearly illustrated in figures 1 and 2. No metastatic nodules were noted in the retroperitoneal lymph nodes.

TREATMENT

This patient was catheterised and subsequently underwent an emergent posterior decompression from T7 to T9, and posterior instrumentation from T6 to T11. A histological examination confirmed the diagnosis of metastatic seminomas of the thoracic vertebra. The patient regained the full neurological function at the time of discharge 7 days postoperatively.

OUTCOME AND FOLLOW-UP

Postoperative isotopic bone scan, CT of the chest and MRI of the brain did not reveal any other metastatic lesions and the serum tumour markers were within the normal limits. The patient then underwent four cycles of bleomycin/etoposide/cisplatin (BEP) chemotherapy and external beam radiotherapy to the axial spine from T5 to T10 at a total dose of 10 Gy in five fractions after discharge. Follow-up 18 fluoro-2-deoxyglucose (18-FDG) positron emission tomography scans performed 3, 6 and 9 months postoperatively did not reveal any evidence of 18-FDG active disease. Subsequent tumour markers at follow-up also stayed flat. At the last follow-up in February 2013, the patient remained asymptomatic.

DISCUSSION

Testicular seminomas have a universally favourable outcome even in the presence of metastasis. Important prognostic factors for relapse of stage 1 seminomas include tumour size more than 4 cm, invasion of rete testis, degree of lymphocytic infiltration of the primary tumour, DNA ploidy status and mitotic rate.^{6 7} Only 15–20% of patients treated with surgery alone with no adjuvant therapy experience relapses, which usually occur in the para-aortic lymph nodes and the lungs.^{6 8–11} Skeletal relapses, while uncommon, frequently affect the lumbar spine.^{12 13} Disease relapse following adjuvant radiotherapy is uncommon and isolated metastasis in the thoracic vertebra is even rarer.

This is the first case of an isolated thoracic spine relapse of a stage 1 pure testicular seminoma after treatment with orchidectomy and radiotherapy. A review of the literature reveals only two other case reports of isolated thoracic spine relapse of testicular seminomas and both were treated with surgery and active surveillance alone.^{14 15} Adjuvant radiotherapy has been shown to be an effective means of locoregional disease control for stage 1 seminomas with a 5-year relapse-free survival rate of more than 95%.^{2–4} Our case of isolated thoracic spinal metastasis postradiotherapy may be the result of ‘escape’ from the radiation field, which typically extends from T11/12 down to L5/S1, where the area at highest risk of relapse is located.

All three case reports of isolated thoracic spine relapses following treatment of a primary testicular seminoma presented with acute spinal cord compression as summarised in table 1.^{14 15} There was no mention of any preceding back pain or radicular pain in all three cases, which is unusual given that only 5–10% of patients with spinal metastases present with cord compression as an initial symptom.¹⁶ The susceptibility of the thoracic spine to cord compression by space occupying lesions can be explained by the unique properties of the thoracic spine which is well described in the literature. The spinal canal of the thoracic spine is narrower than that of the cervical and lumbar spine, with the narrowest point being the mid-thoracic zone (T4–9). The spinal cord to canal ratio in the thoracic spine is around 40%, as compared to 25% in the cervical spine,¹⁷ which renders the cord more prone to compressive injuries in the thoracic spine. Furthermore, the mid-thoracic zone is also the critical vascular zone of the spinal cord with more tenuous blood supply, putting it at increased risk of ischaemic injury.¹⁸

Cord compression can lead to long-term neurological impairment and functional disability if surgical decompression is not done promptly. However, the propensity for thoracic spine lesions to cause cord compression also allows for early detection

Table 1 Existing case reports of isolated thoracic spine metastasis of testicular seminomas

Author/year	Age of primary disease	Presentation/time interval after treatment of primary tumour	Spinal level of metastasis causing cord compression	Initial treatment of primary tumour	Surgical decompression method	Adjuvant treatment	Outcome, follow-up
Present case	36	Bilateral lower limb weakness and numbness, acute urinary retention/ 14 months	T8	Radical orchidectomy and adjuvant EBRT to retroperitoneum (20 Gy)	Posterior laminectomy and instrumentation	BEP chemo and EBRT (10 Gy)	Good, 3 years
Chiba <i>et al</i> 2011	34	Gait disturbance/6 years	T8	Radical orchidectomy and active surveillance	Posterior laminectomy and instrumentation	BEP chemo and EBRT (36 Gy)	Good, 3 years
Don Yee <i>et al</i> 2007	33	Bilateral lower limb weakness and numbness/ 22 months	T12	Radical orchidectomy and active surveillance	Posterior laminectomy and instrumentation	BEP chemo	Good, 3 years

BEP, bleomycin/etoposide/cisplatin; EBRT: external beam radiotherapy.

of disease relapse and possibly better disease prognosis through early treatment.

Skip metastasis of testicular seminomas where the retroperitoneal lymph nodes are not involved in the presence of disseminated disease, as described in this case report, has been described previously.¹⁹ Skip metastasis could suggest the presence of micrometastasis at the point of diagnosis of the primary testicular seminoma, although even micrometastasis also occurs more commonly in the retroperitoneal lymph nodes, and in seminomas with embryonal elements or lymphovascular invasion rather than pure stage 1 seminomas. However there is limited literature on this phenomenon and the exact mechanism behind this unique behaviour of testicular seminomas remains unknown.

In summary, this case report highlights a rare case of an isolated thoracic spine relapse of a low-risk, stage 1 testicular seminoma after treatment with orchidectomy and retroperitoneal irradiation. None of the previously reported cases of thoracic spine relapse of testicular seminomas underwent radiotherapy. While cord compression is not a common presentation of spinal relapse for testicular tumours, it allows for earlier detection and treatment of cancer relapse and, in the process, confers a more favourable prognosis.

Learning points

- ▶ Pure testicular seminomas have a low relapse rate after treatment with surgery and radiotherapy. Relapse usually occurs in the para-aortic lymph nodes and lungs. Skeletal relapses tend to occur in the lumbar spine; thoracic spine relapses are rare.
- ▶ Dissemination of testicular seminomas tends to involve the para-aortic lymph nodes. Systemic metastasis in the absence of para-aortic lymph node involvement is rare.
- ▶ Back pain is the commonest presentation of patients with spinal relapses of previously treated cancers. Acute cord compression is an unusual initial presentation. However due to the larger cord to canal ratio in the thoracic spine, cord compression can occur early for patients with thoracic spine relapses.

Competing interests None.

Patient consent Obtained.

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