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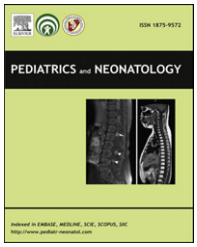

CASE REPORT

Effective Radiotherapy Cured Cauda Equina Syndrome Caused by Remitted Intracranial Germinoma Depositing

Ying-Chun Lu [a,d,e], Hueng-Chuen Fan [a,d,e], Hong-Wei Gao [b,d,e], Chang-Ming Chen [c,d,e], Yee-Min Jen [c,d,e], Shin-Nan Cheng [a,d,e], Shyi-Jou Chen [a,d,e,*]

[a] *Department of Pediatrics, Tri-Service General Hospital, Taipei, Taiwan*
[b] *Department of Pathology, Tri-Service General Hospital, Taipei, Taiwan*
[c] *Department of Radiation Oncology, Tri-Service General Hospital, Taipei, Taiwan*
[d] *Tri-Service General Hospital, Taipei, Taiwan*
[e] *National Defense Medical Center, Taipei, Taiwan*

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Cauda equina syndrome (CES) in children is very rare and can permanently disable. A remitted intracranial germinoma depositing on the spinal cord, leading to CES, has never been reported. We discuss the case of a 10-year-old girl who presented with sudden ataxia, low back pain, sensory deficits of the left lower extremity, and difficulty urinating and defecating 7 months after totally remitted intracranial germinoma postintracranial surgery and cranial irradiation. Magnetic resonance imaging (MRI) of the brain and spine showed multiple intradural extramedullary homogeneous masses from the cervical to lumbar levels, compressing the conus medullaris and cauda equina. After emergent craniospinal irradiation, the patient's neurologic symptoms dramatically subsided. A remitted intracranial germinoma depositing on her spinal cord could be the cause of CES. Early identification and a proper craniospinal irradiation may halt the progression of symptoms.

Abbreviations: CES, cauda equina syndrome; MRI, magnetic resonance imaging.

* Corresponding author. Department of Pediatrics, Tri-Service General Hospital, National Defense Medical Center, No. 325, Cheng-Kung Road, Section 2, Neihu, Taipei 114, Taiwan.
E-mail address: chensjou@yahoo.com.tw (S.-J. Chen).

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1. Introduction

Germ cell tumors are common in children and mostly occur in patients younger than 20 years. Although rare in the West, they are common in Asia, accounting for approximately 3.0% of all primary intracranial tumors.[1] The incidence of germinomas is higher than that of other germ cell tumors in the central nervous system.[2] However, disseminating germinomas leading to neurologic deficits are rare.[3] Cauda equina syndrome (CES) in children is unusual and can permanently disable.[4] Symptoms vary and include low back pain, motor and/or sensory disorders of the lower extremities, and sphincter and bowel dysfunction.[5] The diagnosis of CES is difficult because there is no consensus on diagnostic criteria. Detailed history-taking, careful physical examination, and complete radiologic investigation may shed light on this syndrome. In addition, neurologic deficits such as urination or bowel dysfunction are signs of poor outcome and difficult recovery.[4,6] A variety of underlying pathogens have been identified, but neoplasms such as metastatic germinomas are scarcely noted. We herein present a case of a girl with previously remitted intracranial germinoma depositing on her spinal cord and presenting as CES. She regained normal neurologic function after craniospinal irradiation.

2. Case Report

A 10-year-old girl presented with low back pain for 1 week and sudden limping gait. She was admitted to a medical center for further treatment of ataxia. There was no history of recent trauma, infection, or vaccinations, and she had one suprasellar germinoma (4 × 2 cm in size) that had been partially resected via a cranioorbital zygomatic approach 7 months earlier (Figures 1 and 2). At that time, magnetic resonance imaging (MRI) of the spine and cerebrospinal fluid study revealed no metastatic evidence (Figure 3). The tumor had completely remitted after 22 fractions of whole-ventricle irradiation (24 Gray) and suprasellar boost (12 Gray). No residual or recurrent tumor had been found in the past 7 months' regular follow-up.

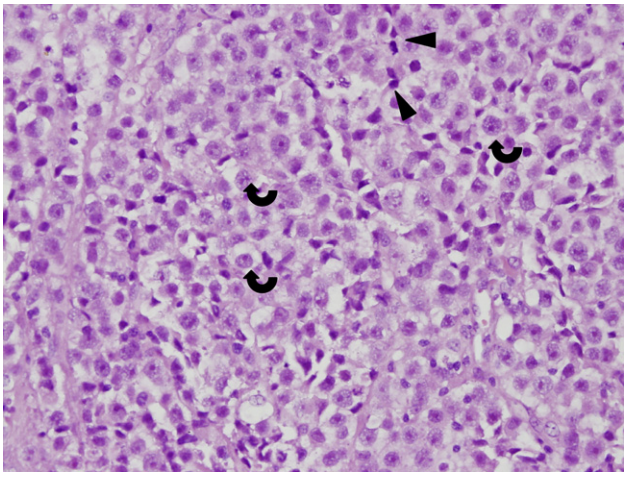

Figure 1 Photomicrograph shows a proliferation of germinoma cells, which are characterized by large tumor cells (curved arrows) with well-defined cell membrane border, clear cytoplasm, central nucleus, and prominent nucleoli as well as small round lymphocytes (arrowheads) infiltrating among the tumor cells (original magnification, ×200; hematoxylin-eosin stain).

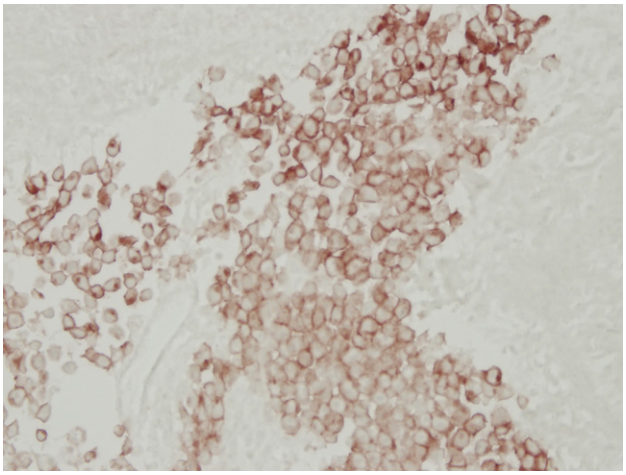

Figure 2 Positive C-kit immunohistochemical reaction for tumor cells (original magnification, ×200; C-kit).

On examination, this patient was alert with clear mentality. Palpation revealed local tenderness and numbness from the patient's left foot to the left side of her waist, conditions that were not present before admission. Severe tenderness and poor sensitivity to pin prick and light touch with a sensory level at T11-S2 on the left were found. The patient had difficult micturition and impaired bowel movement. The muscle power grading of her right lower limb was 2+, left lower limb 3+, and the upper limbs 5+. Deep tendon reflexes of the lower limbs had increased, but those of the upper limbs remained normal. Digital examination revealed a weak anal tone. Laboratory tests showed that β-human chorionic gonadotropin and α-fetal protein levels were normal. Taken together, the patient's clinical presentation and her laboratory investigations were not consistent. To rule out the recurrence of germinoma, we arranged a contrast-enhanced MRI of the brain and spine that showed multiple intradural extramedullary homogeneous masses from the cervical to lumbar levels, compressing the conus medullaris, cauda equina, and cervical and thoracic cords, especially at C7, T9, and T11 (Figure 4), and her brain displayed no abnormalities. Her clinical manifestations and imaging findings supported the diagnosis of CES, and recurrent germinomas depositing on the spine were highly suspected. However, her family rejected pathologic proof of CES. Therefore, empiric therapeutic plans focusing on germinomas were launched, including intravenous dexamethasone 10 mg three times per day and radiation therapy with 12 fractions covering the entire brain (18 Gray) and 15 fractions covering the entire spine (40 Gray). The patient made a full recovery after these treatments. Her neurologic impairments, including ataxia, sensory deficits, muscle weakness, and urination and bowel dysfunction were returned to normal status on the 35th day. She could walk freely without any assistance, and a series of follow-up MRIs of the spine showed no residual tumor after 22 months (Figure 5).