Case report

Schwannoma of the conus medullaris

Gökmen Kahilogulları MD, Zafer Aydın MD, Murat Ayten MD, Ayhan Attar MD, Atilla Erdem MD

Department of Neurosurgery, Faculty of Medicine, University of Ankara, Turkey

Summary We report a rare case of schwannoma of the conus medullaris. A 38-year-old female presented with pain and numbness in her lower limbs. Magnetic resonance imaging confirmed a heterogenous tumour of the conus medullaris. A subtotal resection was performed and histology confirmed schwannoma. The literature regarding these rare tumours, and their cell of origin, is reviewed.

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Correspondence to: Gökmen Kahilogulları MD, Ankara Üniversitesi Tıp Fakültesi Nörosirürji Anabilim Dalı, 06100 Samanpazarı, Ankara, Turkey.
E-mail: gokmenkahil@hotmail.com

INTRODUCTION

Schwannomas account for 30% of all intraspinal neoplasms[1] but intramedullary spinal schwannomas are rare. They comprise approximately 0.3% of primary intraspinal neoplasms.[3] In the literature, 62 cases have been described. We present a schwannoma of the conus medullaris.

CASE REPORT

A 38-year-old female was admitted to our clinic with pain around her waist and in her legs for seven months. She also complained of numbness in her legs. Her physical and neurological examination was normal. Magnetic resonance imaging (MRI) scan disclosed an intramedullary tumour at the T12-L2 vertebral levels. It measured $5 \times 1.8 \times 1.5$ cm (Fig. 1(A)). A T12 to L1 laminectomy was performed and a subtotal removal of the intramedullary tumour was achieved using microsurgical techniques. Due to dense adhesion, part of the tumour capsule was left on the conus medullaris. Her postoperative neurologic examination was normal. Postoperative MRI revealed minimal residual tumour (Fig. 1(C)). Pathological examination revealed a schwannoma (Fig. 1(B) and (D)). Immunohistochemistry was positive for S-100 protein and negative for glial fibrillary acidic protein (GFAP) and epithelial membrane antigen (EMA). Post-operatively her numbness decreased and the pain resolved completely.

DISCUSSION

Intramedullary schwannomas are rare due to the absence of Schwann cells on the fibres of the central nervous system. Thus, the pathogenesis is unclear, but several theories regarding the cell of origin have been suggested: [4]

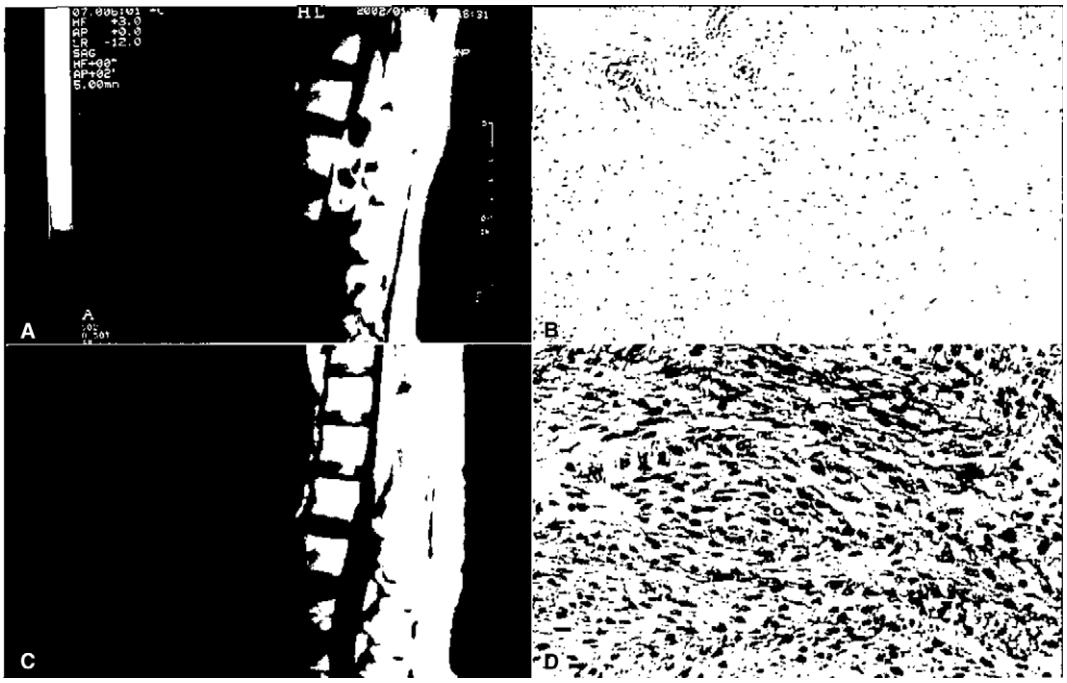

Fig. 1 (A) (Left upper) T1-weighted, gadolinium-enhanced preoperative sagittal MRI showing the heterogenous conus medullaris tumour at T12-L2; (C) (Left lower) T1-weighted postoperative, sagittal MRI showing a small amount of residual tumour; (B) (Upper right) On the H & E examination the tumour is cellular in some areas and oedematous in others. The tumour cells have a rounded elliptical nucleus and formed bunches. Hyalinisation is seen around some vessels (×200); (D) (Lower right) Higher power view (×400).

1. Ectopic Schwann cells originating from the embryonic neural ridge.
2. Schwann cells ensheathing aberrant intramedullary nerve fibres.
3. Schwann cells extending along the branches of the anterior spinal artery.
4. Neoplastic growth of Schwann cells extending into the cord from the area where the posterior nerve roots enter the pia mater.
5. Transformation of pial cells of neuroectodermal origin into Schwann cells.

Intramedullary schwannomas are more common in males with a male:female ratio of 1.4:1. Patients range in age from 9 to 75 years (mean 40.5). Binatlı et al.[2] reported the duration of symptoms prior to diagnosis to range between three months and 20 years (mean 31.03 months).

Intramedullary schwannomas most commonly occur in the cervical spine (61%). They are less common in the thoracic (29%) and lumbar (10%) spine.[2] This case, located at the conus medullaris is very rare.

MRI is the imaging technique of choice for these lesions.[4,5] Pathological findings include cells with a rounded elliptical nucleus and vascular hyalinisation. Tumour cell cytoplasm was immunohistochemically reactive to S-100 protein and non-reactive to GFAP and EMA. Thus these findings are consistent with schwannoma (Fig. 1).

CONCLUSION

Intramedullary schwannomas are slow-growing benign tumours. Complete resection is advised to avoid recurrence. Total resection may be difficult however, due to adherence of the tumour to neural tissue, creating the risk of unacceptable operative morbidity.

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Chronic subdural haematoma after riding a roller coaster

Iwao Yamakami[1] MD, Seiichiro Mine[1] MD, Akira Yamaura[1] MD, Toshio Fukutake[2] MD

[1]Department of Neurosurgery, Chiba University Graduate School of Medicine, [2]Neurology Service, Kameda General Hospital, Chiba, Japan

Summary We report a 20-year-old man who developed a chronic subdural haematoma (CSDH) after riding a "giant" roller coaster. The patient had a past history of a subdural hygroma, diagnosed six weeks after a motorcycle accident. Three months after this accident, he rode on a roller coaster, but suffered no direct head trauma during the ride. Three weeks later, he developed a CSDH requiring surgical evacuation. Roller coaster riding, associated with high velocities and extreme acceleration/deceleration forces is a modern cause of CSDH in the young, which may be increasing due to ever-faster rides.

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Correspondence to: Iwao Yamakami MD, Department of Neurosurgery, Chiba University Graduate School of Medicine, 1-8-1 Inohana, Chuoku, Chiba 260-8670, Japan. Tel.: +81 43 226 2158; Fax: +81 43 226 2159
E-mail: funa@isl.titech.ac.jp

INTRODUCTION

Roller coaster riding has been documented as a cause of intracranial injuries including subdural haematoma (SDH), subarachnoid haemorrhage due to traumatic intracranial aneurysm,[1] and cerebral ischaemia due to arterial dissection.[2,3] Chronic subdural haematomas (CSDH) are encapsulated, liquefied haematomas that usually occur in the elderly, weeks to months after mild, but direct, head trauma. There are four previously reported cases of CSDH associated with a roller coaster ride.[4–7] We have reported one such case which involves a healthy young woman who developed CSDH after riding a "giant" roller coaster. This current report presents a 20-year-old young man who developed CSDH after riding a "giant" roller coaster, our second such case. We suggest that high velocity and acceleration/deceleration rides constitute a significant risk for the development of CSDH in the young, and that the incidence of this may be underestimated.

CASE REPORT

A 20-year-old, previously healthy, male university student was injured in a collision with a car while driving a motorcycle in July 2002. His Glasgow Coma Score was 11 on admission with no motor weakness. Although magnetic resonance (MR) images revealed multiple small contusions of the cerebrum, he soon recovered consciousness and was discharged 2 weeks later. A follow-up examination in our outpatient clinic one week after discharge revealed a mild headache but no neurological abnormalities. MR images three weeks after that revealed a right-sided subdural hygroma, 1 cm thick. The hygroma was homogenously hypointense on T1-weighted images (T1WI) and hyperintense on T2WI, almost identical to cerebrospinal fluid. The asymptomatic hygroma was treated conservatively and he returned to normal activities. MR images a month later showed no changes in the hygroma (Fig. 1). In October 2002, he rode two "giant" roller coasters, the *Dodonpa* once and the *Fujiyama* three times, at *Fuji-Q Highlands* amusement park, Japan. He suffered no direct head trauma, no loss of consciousness and no severe headache during the ride. He continued to have mild headache and routine MR images in mid-November showed a massive right-sided CSDH, 2.5 cm thick. The haematoma was hyperintense on T1WI MRI, isointense on T2WI, and hyperdense on CT, suggesting a relatively recent haemorrhage (Fig. 2). He con-