

Posterior Mediastinal, Intraspinal, Intradural, Intramedullary Lipoma through a Kovalevsky Canal in the Thoracic Spine

Da-Jiang Ren¹, Uwe Max Mauer², Ulrich Kunz², Fang Li¹, Tian-Sheng Sun¹

¹Department of Orthopaedic, PLA Army General Hospital, Beijing 100700, China

²Department of Neurosurgery, German Armed Forces Hospital, Ulm D-89070, Germany

Spinal lipomas are benign tumors that are usually divided into extradural and intradural types. In all, 60% are located intradurally and 40% are located extradurally. The most common spinal lipomas are known to be associated with dysraphism in the lumbosacral region.^[1] We present a rare case of a posterior mediastinal, intraspinal, intradural, intramedullary lipoma through a Kovalevsky canal combined with the failure of multiple segments from T3 to T6 in the thoracic spine.

A 52-year-old man was admitted to the Department of Neurosurgery, German Armed Forces Hospital in November 2012 with complaints of an unsteady gait and gradually worsening back pain that was radiating to the lower extremities. He was obese (height 168 cm and weight 100 kg) with a body mass index of 35.4 kg/m². In 2000, the patient had experienced an initial onset of back pain without radiation to the lower limbs, which became recurrent. The pain had worsened since 2009, and he presented in 2012 with obvious radicular pain along the thighs and down the lateral sides of the legs during the year before admission. He complained of progressive spastic paraparesis and ataxic gait. He required assistance while walking. The patient denied bladder or bowel dysfunction.

Neurological examination revealed no cranial nerve dysfunction. The patient had lower-extremity spasticity and an unsteady gait, and he was unable to do heel-toe walking. Ankle clonus and patellar clonus were positive bilaterally as was the Babinski sign. The patient had bilateral lower limb hyposthesia below the L1 dermatome. There was a positive Romberg sign. Two-dimensional and three-dimensional computed tomography (CT) reconstruction images showed that there was a complete congenital fusion of the T3 and T4 vertebrae. There was also marked kyphosis caused by failure of multiple segments from the T3 to T6 vertebrae [Figure 1a-1d]. Magnetic resonance imaging (MRI) revealed a posterior mediastinal mass extending to the spinal cord through a

Kovalevsky canal in the middle of the T3 and T4 vertebra, with isointensity to high-signal intensity on T2-weighted images and high-signal intensity on T1-weighted images [Figure 1e and 1f]. Fat-suppression (short tau inversion recovery) MRI showed signal suppression of both the mass and subcutaneous fat [Figure 1g]. The borders between the intramedullary part of the mass and the spinal cord were undefined. The spinal cord was significantly compressed and displaced asymmetrically to the right posterior side of the spinal canal [Figure 1h]. An osseous opening at the middle of the T3 and T4 vertebrae was demonstrated as well as marked kyphosis related to multi-segment failure from T2 to T5 vertebrae.

Because of the progressive neurological deficit, we planned to remove the mass and decompress the affected spinal cord. The patient, with motor evoked potentials, (MEPs) monitoring, underwent mass extirpation of the lipoma through a left thoracic hemilaminectomy. Hemilaminectomy was performed from T2/3 to T3/4, and a crossover was made for better exposure of the spinal canal. After decompression of the spinal canal, there was an obvious increase in the MEPs' amplitude. Once the dural sac was incised, the MEPs' amplitude suddenly dropped significantly because of the instant release of high-intradural pressure. We, therefore, stopped the surgery until the MEPs' amplitude gradually returned to their previous level. Because the mass was intermingled with spinal cord, we were unable to proceed with removing the mass using microscopy and microsurgical techniques.

Address for correspondence: Prof. Uwe Max Mauer,
Department of Neurosurgery, German Armed Forces Hospital,
Ulm D-89070, Germany
E-Mail: uwemaxmauer@bundeswehr.org

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

© 2017 Chinese Medical Journal | Produced by Wolters Kluwer - Medknow

Received: 25-07-2017 **Edited by:** Qiang Shi

How to cite this article: Ren DJ, Mauer UM, Kunz U, Li F, Sun TS. Posterior Mediastinal, Intraspinal, Intradural, Intramedullary Lipoma through a Kovalevsky Canal in the Thoracic Spine. Chin Med J 2017;130:2761-2.

Access this article online

Quick Response Code:



Website:
www.cmj.org

DOI:
10.4103/0366-6999.218001

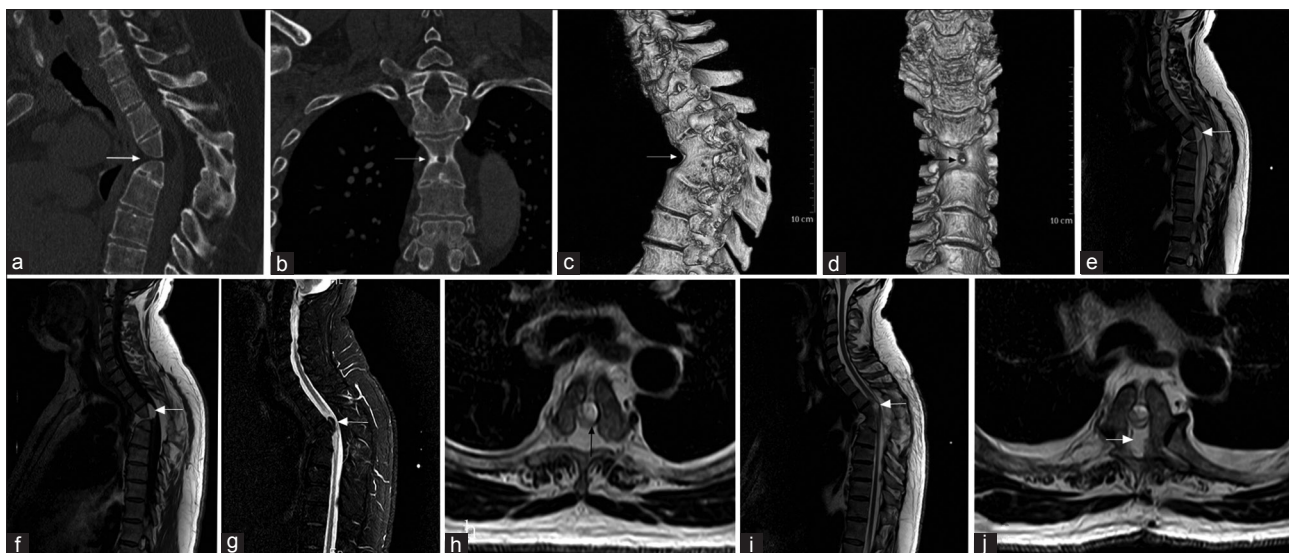


Figure 1: Sagittal and coronal images of two-dimensional (a and b) and three-dimensional computed tomography (c and d) reconstructions show congenital kyphosis and Kovalevsky canal (arrows). MRI shows a posterior mediastinal mass at the level of T3 and T4 ([e and f] arrows). Fat-suppression MRI shows signal suppression of both the mass and subcutaneous fat ([g] arrow). Axial T2-weighted image (h) shows the spinal cord was significantly compressed (arrow). Postoperative sagittal (i) and axial (j) MRI scans show the rest of the mass and the effect of the left hemilaminectomy (arrows). MRI: Magnetic resonance imaging.

Postoperatively, the neurological function of the patient was satisfactory, especially regarding his preoperative spastic gait, and he could walk without assistance or guidance. Sensory loss in the lower extremities also improved. Postoperative sagittal and axial [Figure 1i and 1j] MRI scans demonstrated partial removal of the mass and the effects of the left hemilaminectomy. After 3-month follow-up, the patient had a better recovery of spastic gait, but a sensory loss in the lower extremities still existed and had no improvement.

Spinal lipomas have been broadly classified into five clinical entities lipomyelomeningocele, fatty filum, intradural spinal mass, epidural lipomatosis, and spinal angioliipoma. Among them, epidural lipomatosis usually occurs in obese people, patients with a history of corticosteroid use, and those with an endocrinopathy.^[2] The Kovalevsky or neurenteric canal is defined as a canal connecting the neural tube and archenteron in the embryo, resulting from a persisting abnormal communication between the notochord and yolk sac and the amnion during an early stage of embryonic development. It has been mentioned in conjunction with the neurenteric cyst.^[3] We described herein a rare posterior mediastinal lipoma with extension to the spinal canal, subdural space, and spinal cord through a Kovalevsky canal. There was no evidence of spinal dysraphism in this case according to the physical examination and MRI and CT images. We also noted that this extremely rare lipoma did not exist alone but appeared with spinal malformation of a Kovalevsky canal and failure of multiple segments.

Surgical intervention for asymptomatic lipoma of the spine has been controversial in regard to such issues

as (1) whether early prophylactic surgery to prevent neurological deterioration is necessary or (2) the extent of surgical resection necessary. In our case, totally excising the dorsal lipoma was not only a challenge to the surgeon but also carried a great risk to the patient because of the thickened blood vessels growing into the lipoma and the transient episode of intraoperative neurological worsening.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Arslan E, Kuzeyli K, Acar Arslan E. Intraspinial lipomas without associated spinal dysraphism. *Iran Red Crescent Med J* 2014;16:e11423. doi: 10.5812/ircmj.11423.
- Finn MA, Walker ML. Spinal lipomas: Clinical spectrum, embryology, and treatment. *Neurosurg Focus* 2007;23:E10. doi: 10.3171/FOC-07/08/E10.
- Rodríguez-Cano L, Bartralot R, García-Patos V, Mollet J, Malagelada A, Castells A, *et al.* Cervico-thoracic lipoma associated with occult syringohydromyelia. *Pediatr Dermatol* 2007;24:E76-8. doi: 10.1111/j.1525-1470.2007.00447.x.