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Case Report

Intradural Lipoma at the Craniocervical Junction Presenting with Progressing Hemiparesis: A Case Report

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Keywords
Case report · Craniocervical junction · Foramen magnum · Lipoma · Spinal dysraphism

Abstract
Intradural spinal lipomas are rare in an adult population. They are mostly asymptomatic and usually associated with spinal dysraphism in a pediatric population. We report a rare case of spinal lipoma without dysraphism and with progressing hemiparesis. A 60-year-old woman had incidental lipoma at the craniocervical junction observed for more than 5 years. Recently, she developed right-sided hemiparesis and sensory disturbance. Radiological studies revealed a large lipoma compressing the dorsal medulla and C1–C2 spinal cord. Standard midline suboccipital craniotomy and C1 laminectomy were performed, and the lipoma was removed subtotally. The lipoma showed severe adhesion to the dorsal medulla and C1 spinal cord; therefore, the excision was limited as internal debulking. Her neurological deficit subsided within 6 months after the decompressive surgery. Considering the benign nature of lipoma, internal decompression is a reasonable management for this lesion.

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Introduction

Intradural lipoma at the craniocervical junction is extremely rare [1, 2]. Cervical intradural lipomas are usually associated with spinal dysraphism. The majority of intradural lipomas are usually asymptomatic and no treatment is required. Spinal lipomas extending intracranially with clinical presentation are extremely rare [3, 4]. We report such a rare case of symptomatic lipoma at the craniocervical junction without spinal dysraphism.

Case Report

A 60-year-old woman had been followed elsewhere for over 5 years for an incidentally found lipoma at the craniocervical region. She was then referred to us due to progressing motor weakness in her right extremities, associated with paresthesia for 3 months. Her neurological examination revealed mild hemiparesis in the right extremities and disturbance of deep perception. Bladder and bowel function were normal. Computed tomography (CT) scans showed a low-density mass compressing the dorsal aspect of the medulla and the spinal cord (Fig. 1). There was no abnormality of the vertebral bony components (Fig. 1a). The mass showed a high-intensity signal on T1-weighted magnetic resonance imaging (MRI) (Fig. 1b), which was consistent with lipoma by fat suppression sequence. This lipoma was detected 5 years ago; however, the previous MRIs at the initial hospital were not available. Surgery was planned to decompress the medulla and the C1–C2 spinal cord by opening of the foramen magnum, performing a laminectomy of the C1 arch and debulking the lipoma.

The patient was placed in the prone position under general anesthesia. Motor evoked potentials were monitored during the surgery. A suboccipital midline skin incision was made from the inion to the C3 level. A standard suboccipital craniotomy with opening of the foramen magnum and a C1 laminectomy were performed. The dura mater of the posterior fossa and the spinal cord looked normal. Opening of the dura mater revealed a yellowish mass covered by the arachnoid membrane, indicating a lipoma (Fig. 2a). The mass was dissected from the cerebellar tonsils and the medulla at the upper pole, then it was partially removed (Fig. 2b). It was difficult to establish a dissection plane on the lateral and inferior aspects of the medulla and the spinal cord (Fig. 2c). Internal decompression was performed with an ultrasound aspirator for the main mass towards the caudal pole. The mass was hemorrhagic, which could be controlled by bipolar coagulation. The incised arachnoid membrane was sutured to avoid later adherent tethering of the cord (Fig. 2d). An expansile duraplasty was not performed as sufficient subdural space was obtained after the decompression. Histological examination confirmed that the mass consisted of mature adipocytes, confirming a benign lipoma. The postoperative course was uneventful. No neurological deterioration was noted. The right hemiparesis and deep perception improved within a month after surgery. The postoperative CT scans showed adequate decompression of the medulla and the spinal cord (Fig. 3a). A follow-up MRI taken 12 months after the surgery showed no recurrence or regrowth of the lipoma (Fig. 3b). Her neurological deficit subsided completely at the follow-up examination.

Discussion

Spinal intradural lipomas are rare lesions accounting for less than 1% of spinal tumors [5], which are commonly associated with spinal dysraphism at the lumbosacral region [3, 4].

Spinal lipomas without dysraphism are rare and are usually located in the cervicodorsal region [6]. Lipomas consist of mature adipocytes in the matrix of fibrous connective tissue, which may contain muscle, neural tissue, and epithelial apparatus. Lipomas at the craniocervical junction with intracranial extension are extremely rare. In our extensive search of the literature, only 14 cases of such lesions were reported [1, 7].

Intradural lipomas are considered to be dysembriogenic lesions. Therefore, asymptomatic lipomas can be observed without any surgical treatment. For symptomatic cases, however, surgical removal should be considered as a treatment option [1, 8]. In the literature, the growth of lipomas is divided into 2 patterns. One group shows early clinical manifestation in early infancy or childhood, such as floppy baby syndrome and progressive tetraplegia [9, 10]. The other group shows symptoms in adults in the second or third decade of life. These patients are considered to become symptomatic due to fat deposition in metabolically normal fat cells of the lipomas [11]. In most cases, the clinical course is static for a long time. However, neurological deterioration may develop progressively in some cases. In our case, the patient showed no neurological deficits for at least 5 years since the lipoma was incidentally found; then, she exhibited progressive deterioration in a short term, suggesting that close observation is necessary even for asymptomatic patients, especially those who have lipomas in eloquent areas.

The current consensus for symptomatic lipomas is to decompress the underlying neural tissue [1, 8, 12–14]. An attempt to remove an adherent lipoma may be harmful, especially close to the brainstem at the craniocervical junction. Most of the previous reports indicated favorable results only by partial or subtotal removal [12–14]. In our case, the lipoma showed severe adhesion to the dorsal aspect of the medulla and the spinal cord, which made it impossible to find a dissection plane. The vascularity of lipomas is relatively high, and normal vessels may pass through inside. Any damages of these vessels may harm the underlying neural tissue by ischemia or venous congestion. Considering the benign nature of lipomas, therefore, surgical removal should be terminated when sufficient decompression is achieved.

A rare case of spinal lipoma at the craniocervical junction with neurological symptoms is described. Close observation is crucial even for asymptomatic cases. Subtotal resection may be a reasonable treatment for lipomas in this region.

Statement of Ethics

The patient provided informed consent to participate in this paper, which was approved by the institutional review board.

Disclosure Statement

There are no potential conflicts of interest for any of the authors with products or techniques discussed in the paper.

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Author Contributions

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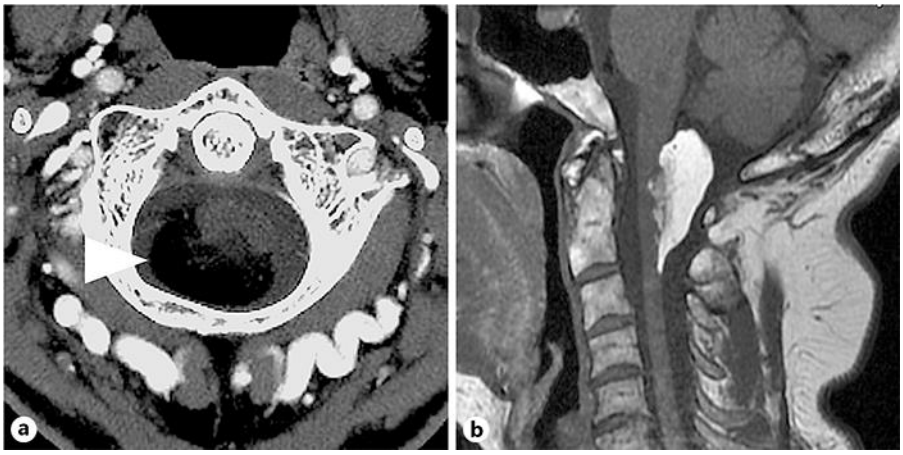

Fig. 1. **a** An axial image of an enhanced computed tomography scan at the C1 level shows a nonenhanced low-density mass compressing the spinal cord (white arrowhead). **b** Sagittal T1-weighted magnetic resonance imaging indicates that the lipoma is located at the dorsal aspect of the medulla oblongata and the spinal cord.

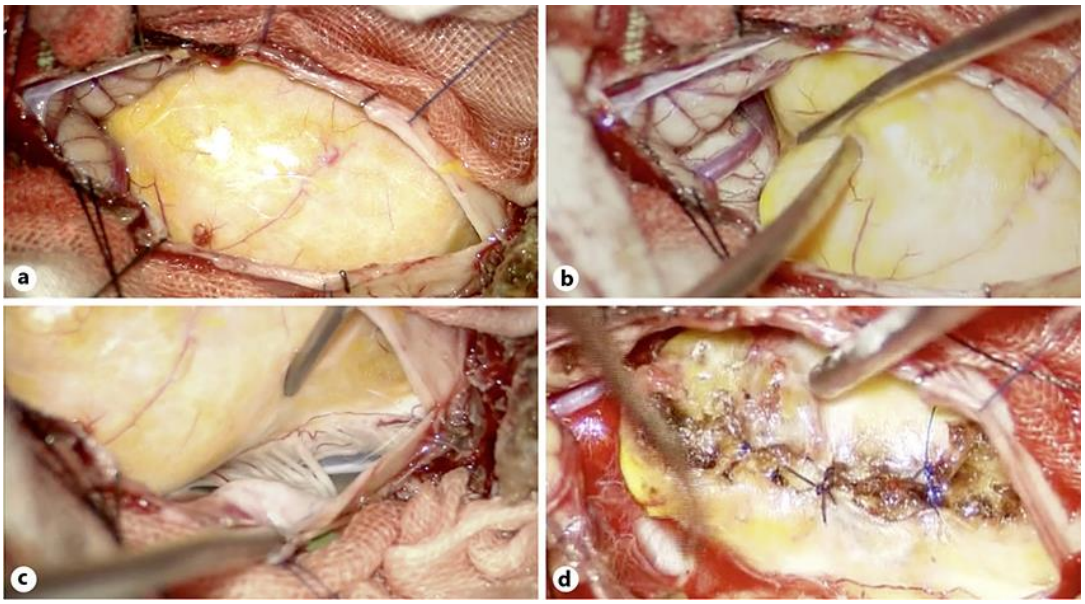

Fig. 2. **a** Dural incision revealed the lipoma covered by the pia mater. **b** The mass could be partially dissected at the upper pole from the cerebellar tonsils and the medulla oblongata. **c** The dorsal spinal roots arise close to the mass. The cleavage between the lipoma and the spinal cord is obscure. **d** The overlying pia mater was sutured after internal decompression.

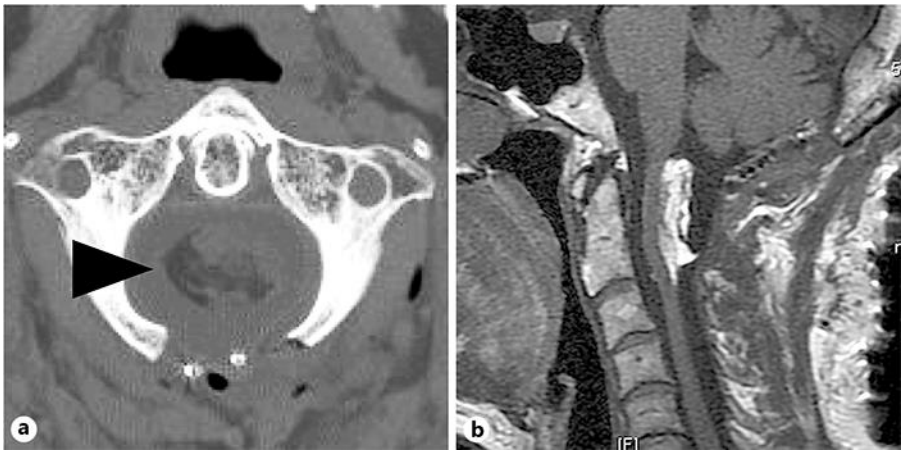

Fig. 3. **a** An axial image of a computed tomography scan at the C1 level shows decreased volume of the mass (black arrowhead) and laminectomy performed. **b** Sagittal T1-weighted magnetic resonance imaging shows partial removal of the lipoma.