

Multilevel Cervical Laminoplasty and Syringotomy for a Long-Segment Cervical Syrinx Mimicking an Intramedullary Tumor: A Case Report

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ABSTRACT

Background: Long-segment intramedullary cervical cord lesions can present a diagnostic challenge, particularly when imaging findings raise suspicion of an intramedullary neoplasm. Differentiating a syrinx from an intramedullary tumor is important for operative planning, as the surgical strategy may differ substantially.

Case presentation: A 43-year-old female presented with a six-month history of progressive cervical pain with radicular symptoms, vertigo, left upper-limb sensory disturbance, and impaired left-hand grip. Neurological examination revealed preserved motor power of 5/5 in all four limbs, normal reflexes, and reduced functional grip in the left hand. MRI of the cervical spine demonstrated a long-segment expansile intramedullary lesion extending from the cervicomedullary junction to C7, without contrast enhancement. The radiological report also described Chiari malformation and syringomyelia. Given the diagnostic uncertainty and progressive symptoms, we performed urgent surgical exploration within two days of admission. We performed a C3–C7 laminoplasty to provide multilevel posterior access while preserving the laminar elements without instrumented fixation. Following durotomy and midline myelotomy, a syrinx was identified, with no obvious intramedullary tumor. Syringotomy and drainage were performed, and adjacent spinal cord tissue was obtained for biopsy. Graft duraplasty and reconstruction of the elevated laminae were completed. The patient had an uncomplicated postoperative course, with relief of pain and vertigo and resolution of sensory symptoms. She was discharged with intact motor power and improved but residual left-hand grip weakness. Follow-up MRI demonstrated cord decompression and drainage of the syrinx.

Conclusion: This case illustrates the diagnostic uncertainty that may arise when a long-segment non-enhancing intramedullary cervical lesion is suspected to represent a tumor. Intraoperative findings guided the surgical procedure toward syringotomy and drainage, with tissue sampling to investigate a possible underlying neoplasm. Multilevel laminoplasty provided posterior access while allowing reconstruction of the cervical laminar elements. Histopathological confirmation and longer-term follow-up remain necessary.

KEYWORDS: Cervical syringomyelia; Chiari malformation; intramedullary spinal cord lesion; laminoplasty; syringotomy; duraplasty; diagnostic dilemma.

INTRODUCTION

Intramedullary spinal cord lesions present a diagnostic and therapeutic challenge because of the limited anatomical space available for the spinal cord and the potential for neurological deterioration associated with both the underlying pathology and surgical intervention. The differential diagnosis of an expansile intramedullary lesion includes neoplastic and non-neoplastic conditions, and careful interpretation of clinical and radiological findings is essential for operative planning.

Syringomyelia is characterized by the presence of a fluid-filled cavity within the spinal cord. It may occur in association with Chiari malformation, spinal cord tumors, trauma, and other disorders that alter cerebrospinal fluid (CSF) dynamics. Its clinical presentation varies according to the extent and location of the cavity and may include pain, sensory disturbances, and motor dysfunction.

Intramedullary lesions that do not demonstrate contrast enhancement may present a particular diagnostic challenge. Previously published case reports have described non-neoplastic intramedullary lesions mimicking spinal cord tumors, illustrating the potential for overlap in radiological appearances. ⁽³⁾

Surgical management of multilevel cervical pathology requires careful consideration of spinal cord decompression and preservation of spinal stability. Cervical laminoplasty is an established posterior decompressive procedure designed to expand the spinal canal

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while retaining and reconstructing the posterior elements. However, its use must be individualized according to the underlying pathology, cervical alignment, stability, and surgical objectives.

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We report a case of a 43-year-old female with a long-segment non-enhancing cervical intramedullary lesion, radiologically associated with Chiari malformation and syringomyelia, initially considered to represent an intramedullary tumor. Intraoperative exploration revealed a syrinx without an obvious tumor, leading to syringotomy, drainage, biopsy, and graft duraplasty through a multilevel C3–C7 laminoplasty.

1. CASE PRESENTATION

1.1 Clinical history

A 43-year-old female presented with a six-month history of progressively worsening cervical pain, radicular symptoms, vertigo, and left upper-limb functional impairment. The patient reported gradual development of left-hand grip weakness, with increasing difficulty holding objects. She also described numbness along the medial aspect of the left hand, extending from the neck toward the tip of the little finger.

There was no reported history of trauma, infection, or previous surgical intervention. The symptoms had progressed gradually over the preceding six months, prompting clinical evaluation and radiological investigation.

1.2 Neurological examination

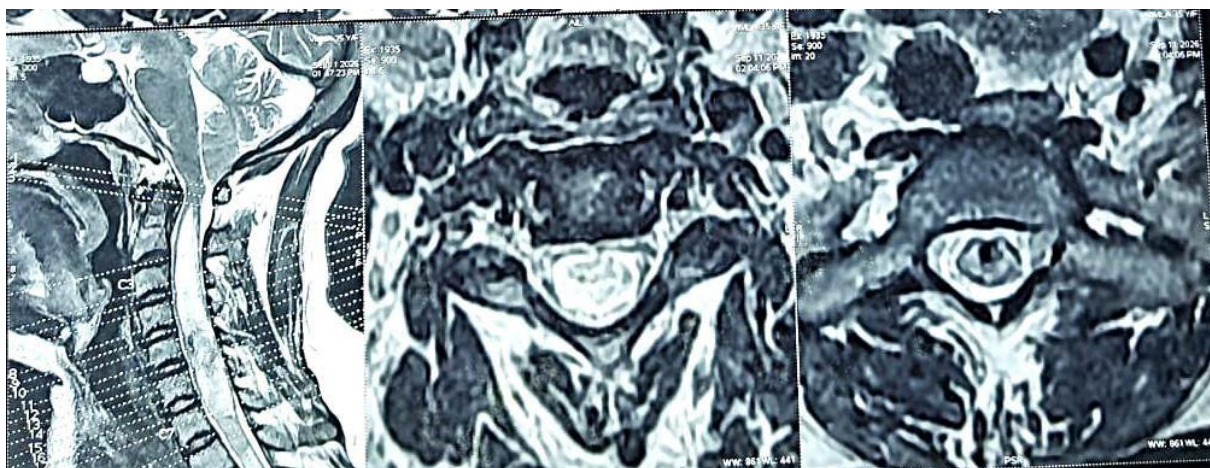
On preoperative neurological examination, motor power was preserved at 5/5 in all four limbs. However, the patient demonstrated impaired functional grip in the left hand, with difficulty forming a grip and holding objects. There was no apparent deformity of the fingers or hand. The right hand had normal function and appearance.

Deep tendon reflexes were normal. Cranial nerve examination was unremarkable.

The patient was independently ambulatory without support, although severe neck pain required her to rest intermittently. No other neurological abnormalities were reported.

1.3 Radiological findings

MRI of the cervical spine demonstrated a long-segment expansile intramedullary lesion extending from the cervicomedullary junction to approximately C7. The initial MRI report described a lesion measuring approximately 8.7 cm in craniocaudal length and 1.2 cm in maximum thickness. It was reported as T2/STIR hyperintense and T1 hypointense, with internal signal variations.



picture 1: axial and sagittal cuts of cervical mri depicting expansive cervical cal intramedullary lesion

The lesion did not demonstrate contrast uptake following administration of contrast material. The contrast radiological report described a Chiari malformation and dilatation of the central canal, with the possibility of an extensive syrinx.

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PICTURE 2: CONTRAST ENHANCED MRI OF CERVICAL SPINE DEPICTING CHIARI MALFORMATION WITH SUSPECTED SYRINGOMYELIA

The initial radiological interpretation raised suspicion of an intramedullary cervical cord tumor. The combination of a long-segment expansile lesion, associated Chiari malformation, and lack of enhancement created diagnostic uncertainty regarding the underlying pathology.

1.4 Surgical indication and preoperative planning

In view of the progressive neurological symptoms, significant functional impairment of the left hand, and radiological suspicion of a long-segment intramedullary cervical lesion, urgent surgical exploration and decompression were planned.

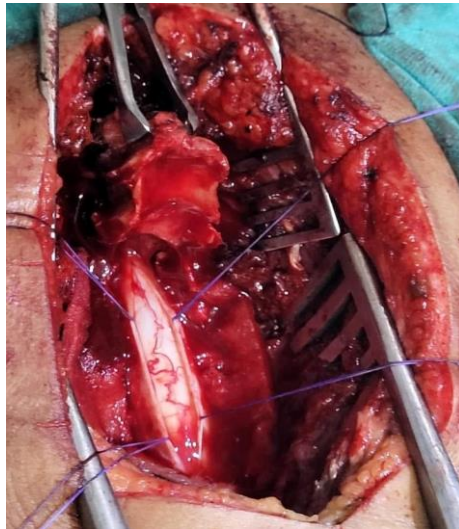
The provisional preoperative diagnosis was an intramedullary cervical spinal cord tumor. The operative strategy was planned to provide posterior access to the involved cervical levels, with the possibility of proceeding according to the intraoperative findings. Considering the multilevel extent of the lesion and diagnostic uncertainty, a C3–C7 laminoplasty was selected instead of conventional multilevel laminectomy with fixation. The aim was to obtain adequate posterior access while retaining and reconstructing the laminar elements.

2. SURGICAL TECHNIQUE

The patient underwent surgery under general anesthesia; the patient was positioned prone. A posterior midline cervical incision was made, and soft tissue dissection was performed to expose the posterior elements from C3 to C7.

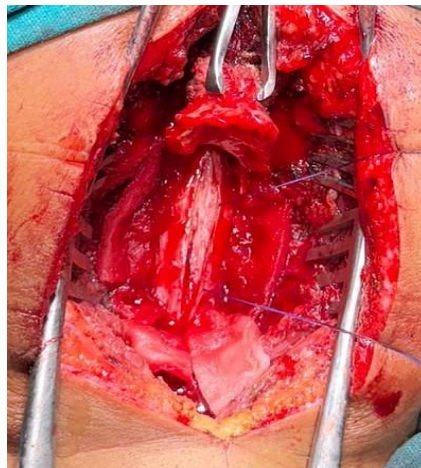
Bilateral lamina–lateral mass junctions were drilled, and the laminae from C3 to C7 were elevated using Allis forceps. The elevated laminar segments were held in position to allow posterior access to the spinal cord.

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PICTURE 3: Elevation of the laminar flaps with durotomy

After adequate exposure, the dura mater was opened to expose the underlying spinal cord. A midline myelotomy was performed, revealing a syrinx within the cord. No obvious intramedullary tumor was identified during exploration. Syringotomy was performed by opening the cord, allowing drainage of the syrinx. Adjacent spinal cord tissue was obtained for histopathological examination to investigate the possibility of an underlying neoplastic lesion.



PICTURE 4: Post-surgical decompression of syrinx with elevated flaps

Following drainage and decompression of the spinal cord, meticulous hemostasis was achieved. Graft duraplasty was performed, and the dural closure was secured using sutures. The closure was subsequently assessed using a Valsalva maneuver. The elevated laminar flaps were repositioned and secured to the surrounding soft tissues using sutures. A drain was placed and secured, and the surgical wound was closed in layers. The patient was extubated at the end of the procedure and transferred to the ward in a stable condition.

3. POSTOPERATIVE COURSE AND FOLLOW-UP

The patient was extubated following surgery and transferred to the ward with stable vital signs and a full Glasgow Coma Scale score. She experienced relief of cervical pain and vertigo in the immediate postoperative period. The preoperative sensory symptoms resolved.

Motor power remained intact in all four limbs. Left-hand grip function was improved, although some weakness persisted. The postoperative course was uncomplicated, with no reported neurological deterioration or other immediate complications.

The surgical drain was removed on postoperative day 3. At discharge, the patient had intact motor power, normal sensation, and resolution of pain, with improvement but residual weakness of the left-hand grip.

At the follow-up assessment, the patient was clinically normal with improved functional use of the affected hand. Follow-up MRI demonstrated decompression of the cervical cord and drainage of the syrinx.

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PICTURE 5: Post op MRI showing cervical syrinx decompression with laminoplasty

Histopathological examination of the adjacent spinal cord tissue obtained during surgery remains awaited.

4. DISCUSSION

4.1 Diagnostic considerations

The present case illustrates the difficulty of interpreting an extensive intramedullary cervical lesion when the clinical and radiological findings do not establish a definitive diagnosis. The patient presented with progressive cervical pain, radicular symptoms, vertigo, and left-hand functional impairment. MRI demonstrated a long-segment expansile intramedullary lesion without contrast uptake, alongside a radiological report of Chiari malformation and central canal dilatation.

Although the initial working diagnosis was an intramedullary tumor, the intraoperative finding was a syrinx without an obvious tumor. This discrepancy highlights the importance of correlating radiological findings with direct surgical observations, particularly when the appearance of a lesion is not definitive.

The absence of contrast enhancement was an important imaging feature in this case, but it was not sufficient to exclude an underlying neoplasm. Non-neoplastic intramedullary lesions that mimic tumors have been reported, and the differential diagnosis must be interpreted in the context of lesion morphology, associated abnormalities, and pathological findings.⁽³⁾

The radiological association of Chiari malformation and syringomyelia was also relevant to the diagnostic assessment. However, the available information does not establish the precise relationship between the Chiari malformation and the extensive syrinx in this patient.

4.2 Surgical decision-making

The surgical plan was influenced by the extensive cervical involvement and the need for urgent posterior access. Conventional multilevel laminectomy with fixation was considered, but the team selected laminoplasty because of the number of cervical levels involved and diagnostic uncertainty.

Cervical laminoplasty is an established approach for selected multilevel cervical disorders. It allows expansion of the posterior spinal canal while retaining and reconstructing the laminar elements. Literature comparing laminoplasty with laminectomy-based strategies in multilevel cervical myelopathy emphasizes the importance of individualizing the procedure according to the clinical and radiological circumstances.^(1,2,4)

In this case, laminoplasty provided the posterior exposure needed to perform durotomy, myelotomy, syringotomy, and tissue sampling across the involved region. Reconstruction of the elevated laminae was performed using sutures to the surrounding soft tissues. The case therefore documents the use of a reconstructive posterior approach in a setting where the underlying intramedullary pathology remained uncertain before exploration.

The decision to obtain a biopsy despite the absence of an obvious tumor reflects the diagnostic uncertainty that persisted during surgery. Histopathological analysis will be essential in determining whether an underlying neoplastic or other pathological process was present.

It is important to recognize that evidence concerning laminoplasty in degenerative cervical myelopathy cannot be directly extrapolated to establish its superiority for syringomyelia or intramedullary tumor surgery. The current report describes the operative strategy used in one patient and does not establish comparative effectiveness.

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4.3 Early clinical and radiological outcome

The patient demonstrated an uncomplicated immediate postoperative course, with relief of pain and vertigo and resolution of the preoperative sensory symptoms. Motor power remained preserved in all four limbs, while left-hand grip function improved but was not completely restored at discharge.

The reported follow-up findings showed improved hand functionality and a normal clinical examination. Follow-up MRI demonstrated cervical cord decompression and drainage of the syrinx.

5. CONCLUSION

This case describes a diagnostic challenge involving a long-segment non-enhancing cervical intramedullary lesion initially suspected to be a tumor, with associated radiological findings of Chiari malformation and syringomyelia. Intraoperative exploration revealed a syrinx without an obvious intramedullary tumor, prompting syringotomy, drainage, biopsy, and graft duraplasty.

A C3–C7 laminoplasty provided multilevel posterior access and allowed reconstruction of the laminar elements without instrumented fixation. The patient demonstrated early symptomatic and functional improvement, with postoperative MRI showing cervical cord decompression and drainage of the syrinx.

The case emphasizes the importance of intraoperative assessment when the diagnosis remains uncertain and documents a reconstructive multilevel posterior surgical approach in this setting. Definitive diagnostic conclusions and long-term outcome assessment await histopathology and extended follow-up.

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