Iranian Journal of NEUROSURGERY

2023, Volume 9, No. 9

Case Report

Solitary Fibrous Tumor One Year After Posterior Cervical Laminectomy

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Citation Mahabadi A, Rezvani M, Shafiei M, Mahmoodkhani M, Askariardehjani N. Solitary Fibrous Tumor One Year After Posterior Cervical Laminectomy. Iran J Neurosurg. 2023; 9:E9. http://dx.doi.org/10.32598/irjns.9.9

doi: http://dx.doi.org/10.32598/irjns.9.9

Article info:

Received: 11 Jan 2023

Accepted: 28 Apr 2023

Available Online: 13 Jun 2023

Keywords:

Solitary fibrous tumor, Cervical laminectomy, Soft tissue neoplasm, Postoperative complications, Magnetic resonance imaging

ABSTRACT

Background and Importance: Cervical laminectomy and fixation is a surgery used to treat symptomatic patients who are resistant to medical therapy. However, it can have serious complications affecting patient outcomes.

Case Presentation: This case report describes a rare occurrence of a solitary fibrous tumor at the site of a previous cervical laminectomy in a 45-year-old female patient. Following non-surgical treatment for paresthesia and weakness in the upper limbs due to cervical stenosis, the patient underwent cervical laminectomy from C3-C6 without instrumentation.

Conclusion: One year after the surgery, the patient presented with severe pain and swelling at the surgical site, and radiological evaluation revealed a large mass in the para-vertebral muscular layer. The mass was removed and the microscopic evaluation revealed a typical solitary fibrous tumor. The patient underwent an extension of laminectomy and fusion with lateral mass screw, and follow-up at 6 months showed no recurrence of the tumor.

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Highlights

- Posterior cervical laminectomy can lead to rare soft tissue tumor formation.
- A 45-year-old female developed a solitary fibrous tumor 1 year after surgery.
- The radiological evaluation helped determine the diagnosis of a solitary fibrous tumor.
- The tumor was removed and the patient underwent an extension of laminectomy and fusion.
- Recurrence of the tumor was not observed after a 6-month follow-up.
- Injury to mesenchymal tissue may be a risk factor for solitary fibrous tumors.

Plain Language Summary

This article describes a rare case of a tumor that grew after a patient underwent surgery for a spinal cord problem. The patient was a 45-year-old woman who had surgery to relieve numbness and weakness in her upper limbs. The surgery went well and she was discharged after 3 days. However, a year after the surgery, she returned to the hospital with severe pain and swelling at the surgical site. Further examination revealed a large tumor at the site. The tumor was removed. But the analysis showed it was a tumor called solitary fibrous tumor, a rare type of cancer that can occur in many parts of the body.

1. Background and Importance

Cervical laminectomy and fixation (PCF) is one type of surgery used to treat symptomatic patients resistant to medical therapy; however, this method has serious complications that can affect patient outcomes [1]. Some of the serious complications that can occur after a posterior cervical approach include cerebrospinal fluid (CSF) leakage, surgical site infection (especially when surgery is accompanied by instrumentation), axial pain, fusion failure, graft subsidence, and epidural hematoma [2]. Although the development of a soft tissue tumor after operation is uncommon, this disorder has been reported in the literature [3-6]. Table 1 lists the number of case studies published in this field.

2. Case Presentation

A 45-year-old woman referred to Ayatollah Kashani Hospital, Isfahan, with a major complaint of paresthesia and weakness in the upper limb 2 years ago. Cervical magnetic resonance imaging (MRI) showed spondylosis and moderate to severe cervical stenosis at C3-C6 segments (see pre-operative cervical MRI in Figure 1). Non-surgical treatment methods, such as medication, physical therapy, and cervical collars began following diagnosis. After 3 months, a follow-up examination showed no recovery. Accordingly, she was a candidate for the operation. The evaluation considered that the appropriate approach was cervical laminectomy from C3-4-5-6 without instrumentation. After general anesthesia, intubation with a GluideScope and prone position, safe laminectomy with a high-speed drill, and decompression of the spinal cord (posterior approach) were performed. The patient was discharged 3 days after the operation in good condition. Post-surgical examination and follow-up imaging demonstrated improvement in motor and sensory findings. After one year, she was referred for severe pain and swelling at the surgical site. She had no new neurological deficit. The radiological evaluation determined a large mass at the para-vertebral muscular layer. The MRI showed a large mass that was hyper-intense at T1 sequences and iso-intense at T2 sequences rather than the CSF signal (Figures 2, 3, and 4). There was no relationship between this lesion and the neural element or thecal sac. The main diagnosis that we were thinking about included organized hematoma, abscess formation, or pseudo-meningocele. Reoperation was programmed. After prone position and incision of the skin, we observed, contrary to our expectations, a large mass at the muscular layer with a thick outer layer (Figure 5). This lesion had no stickiness to the lamina or neural elements and was removed and

Table 1. Some of the case studies published in the field of soft tissue tumor in different levels/locations of the spinal column

Row	Age (y)	Site	Tumor Pathology	Operation	Sex	Period Between First Operation and Dx of Tumor	Ref
1	54	T2-T7	Desmid tumor	T4 corpectomy+fusion	F	10 months	[3]
2	58	C5-C7	Desmoid fibromatosis	C5-7 Laminectomy+fusion	M	2 years	[4]
3	87	L3-L4	Gossypiboma	Lumbar laminectomy+fusion	M	19 years	[5]
4	76	L3-L5	Desmoid tumor	L3-5 laminectomy+fusion	M	2 years	[6]

sent to the pathology department and reviewed for detection the accurate diagnosis. Microscopic evaluation of the tumor reported fibroblastic mesenchymal cells with spindle shape cells and staghorn vascular which clearly emphasized the diagnosis of solitary fibrous tumor (the typical type). Because of further operation, we decided to extend laminectomy and fusion with a lateral mass screw. Six months later, the follow-up described no tumor recurrence.

3. Discussion

The solitary fibrous tumor was explained by Wagner for the first time at the end of the nineteenth century and further described in 1931 as a connective tissue neoplasm, such as pleura [7]. Although we might assume it is a rare soft tissue neoplasm, perhaps the developments in diagnostic modalities will change our viewpoint in the future (incidence of 0.2/100 000 annually). The solitary fibrous tumor usually accompanies mesenchymal involvement; therefore, some types of this tumor were previously called hemangiopericytoma [8]. One of the unique patterns of this tumor in histology findings was called a “patternless pattern” because of the distraction of cellular architecture [9]. Because solitary fibrous tumors originate from mesenchymal tissues, they may occur in any region, such as the pleura, abdomen, head, and neck [5]. Similar to many other tumors based on the proliferation rate (mitosis number, hypercellularity), the solitary fibrous tumor will be classified as a “typical” or “malignant” subtype [10]. One of the most important findings in the immunohistochemical evaluation of this tumor is the staining of the transducer and activator of transcription 6 (STAT6), especially in the malignant type [5]. The diagnosis is considered based on the radiologic evaluation. A computed tomography scan showed soft tissue mass with enhancement in about half of the patients. In MRI, the solitary fibrous tumor appears as a variable signal based on the location and subtypes; however, many of the solitary fibrous tumors are iso/hypo in T1 weighted images and iso/hyper in T2 [9]. The main treatment of solitary fibrous tumor is resection but for malignant types, adjuvant therapy may be considered after the operation. Usually, the average follow-up period is about 4-5 years [11]. The recurrence rate is different in the literature from about 4/110 cases (Dimico study) to 18/56 cases (Hohenforset study) [8]. Although solitary fibrous tumor is rare soft tissue cancer, secondary solitary fibrous tumor after cervical laminectomy have been reported rarely.

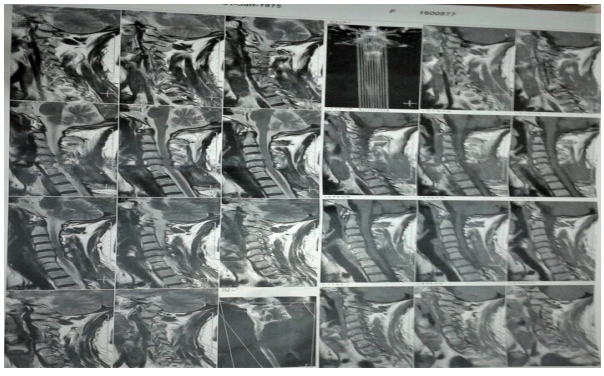


Figure 1. Cervical magnetic resonance imaging 3 months after cervical laminectomy

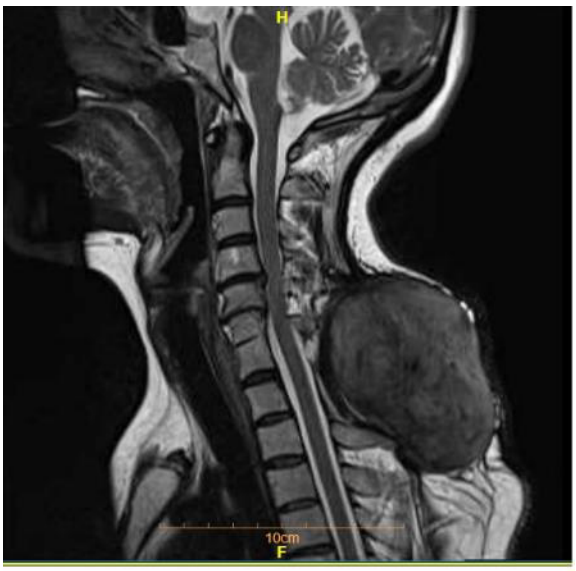


Figure 2. Sagittal T2-weighted magnetic resonance imaging of the mass

Notes: C5/C6 congenital block vertebra was described one year after the primary operation.

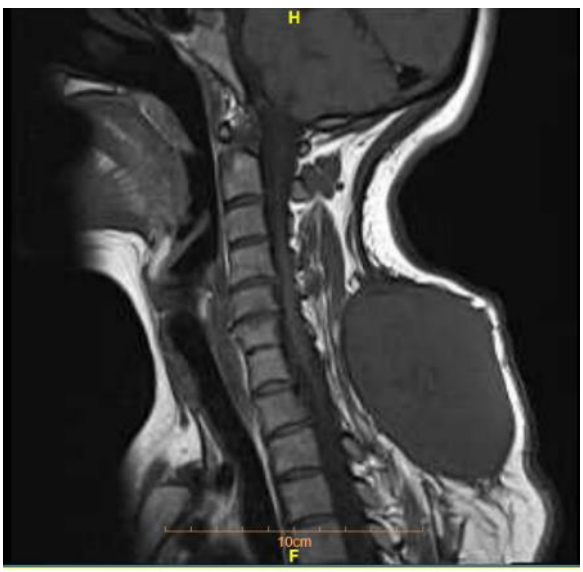


Figure 3. Sagittal T1-weighted magnetic resonance imaging of the mass

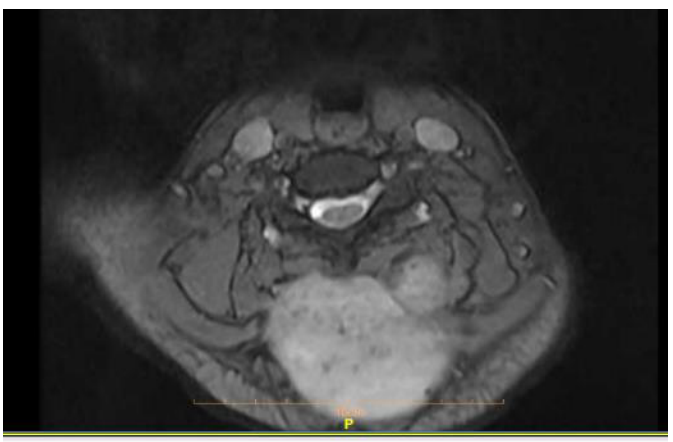
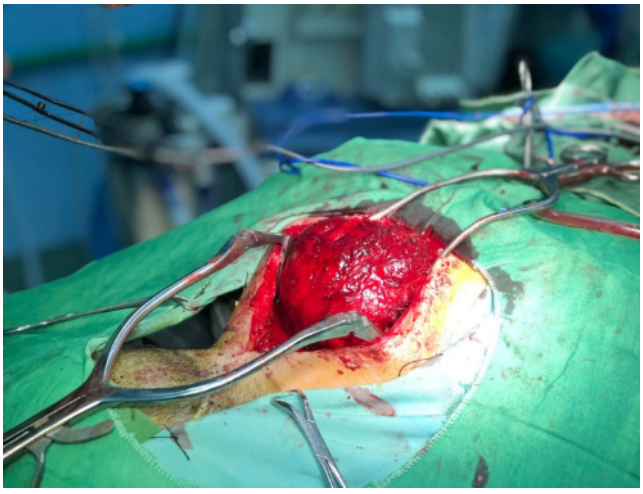


Figure 4. Axial magnetic resonance imaging of the mass



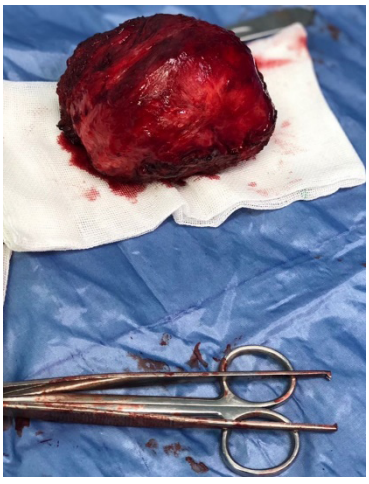


Figure 5. A round mass removed during surgery

4. Conclusion

In this article, we aimed to provide a review of post-operative solitary fibrous tumor development after cervical laminectomy. This case report demonstrated that solitary fibrous tumor at the post-cervical segment is rare. Therefore, after cervical laminectomy, an extremely rare condition underwent tumor resection. Finally, this report states that the mesenchymal tissue injuries can be one of the risk factors for solitary fibrous tumors.

Ethical Considerations

Compliance with ethical guidelines

Written informed consent was obtained from the patient before the operation and for publishing this case report.

Funding

This article received no funding.

Authors' contributions

Conceptualization and study design: Amir Mahabadi, Majid Rezvani, Mehdi Shafiei and Mehdi Mahmoodkhani; Data collection: Navid Askariardehjani; Data analysis and interpretation: Amir Mahabadi; Drafting the article, critically revising and final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

Acknowledgements

The corresponding author would like to thank the Isfahan University of Medical Sciences for their support.

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