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# Thoracic dumbbell shaped tumor causing Compressive Myelopathy– A Case Report

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## Abstract

Spinal schwannoma are tumors arising from Schwann cells covering nerves, exiting from spinal cord. They may present as intradural extramedullary mass and occasionally extend extradurally forming dumbbell shaped tumor. We present a case of a large sporadic spinal schwannoma with predominant extradural component. These types of tumors usually require two staged procedure, but in our patient tumor was completely removed in single stage through posterior approach.

**Keywords:** Dumbbell, Schwannoma, Compressive myelopathy.

## Introduction

A 22 year young male presented to outpatient department with gradual progressive weakness of lower limbs since one month with decreased sensation of all modalities below hip for two weeks.

On examination, patient had increased tone of both lower limbs and exaggerated reflexes of knee and ankle associated with spastic weakness of mainly left lower limb with Medical Research Council(MRC) grade >3. On evaluation, X-ray didn't show any abnormality. MRI revealed contrast enhancing intradural mass spaced at the level of D10 extending extradurally through intervertebral foramen at D10-D11, forming an extra spinal component, which measured 1.8x2.9 cm reaching up to posterior surface of D10 rib. On T1 weighted images, lesion was hypo intense to cord and on T2 weighted image it was hyper intense with homogenous enhancement of gadolinium contrast. (fig. 1a,b,c)

Based on clinico-radiological findings a diagnosis of Intradural mass with extradural extension was made. Patient underwent posterior midline approach D10 intradural and extradural tumor complete excision biopsy and posterior stabilization under general anesthesia. Gross total removal of tumor was achieved (fig. 2 a,b,c). Post-operatively, patient had showed significant improvement in preoperative neurological deficits over a week time. Histopathological report revealed the lesion to be schwannoma with predominant antoni A character. After three weeks follow up, patient had neurological improvement and was walking independently.

## Discussion

Dumbbell shaped tumors represent 6-23 % of total spinal tumors. Tumor develops hourglass shape as result of an anatomic barrier encountered during growth. Such shaped tumors can be neurogenic (neurofibroma, schwannoma, ganglioneuroma and neuroblastoma), nonneurogenic (meningioma and sarcoma), and very rarely hematopoietic neoplasms (lymphoma or solid leukemic infiltrates) [1]. Although of wide histopathological variety, schwannoma contributes to 86%. Most have contiguous intraspinal, foraminal (usually narrower) and extraforaminal component. If lesion is long standing, we might find widening of neural foramen on plain X- ray.

The extra spinal tumor extension is usually greater than intra spinal component. Patient usually present with local back pain or weakness or sensory disturbance associated with particular dermatome or at late stage with compressive myelopathy features.

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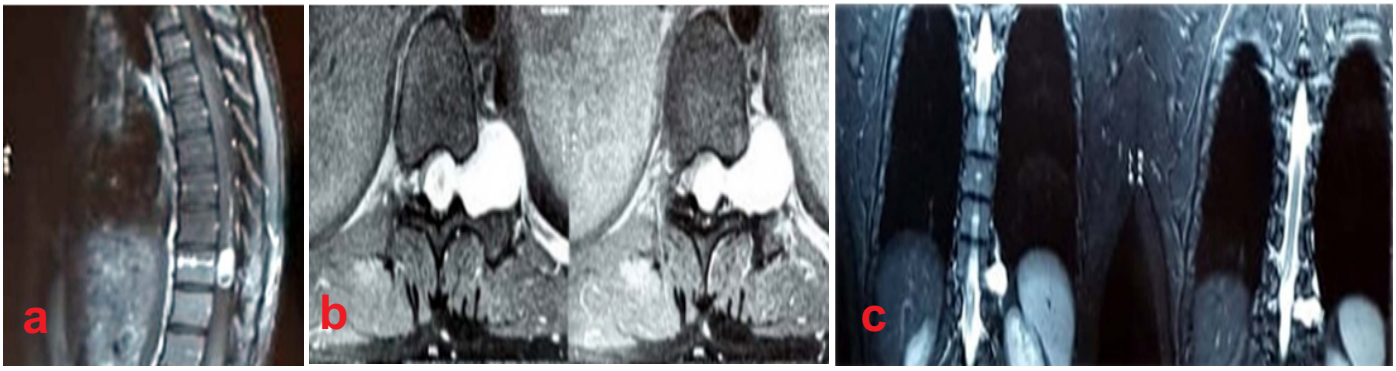


**Figure 1:** (a) MRI with contrast showing enhancing lesion at level of D10. (b) MRI with contrast axial section showing homogenously enhancing left-sided lesion, intradural with extradural extension producing dumbbell-shaped morphology. Spinal cord pushed towardthe right side. (c) MRI with contrast scan coronal view showing lesion arising from D10-11 level on the left side.

Asymptomatic patient with smaller tumors can be followed up as most of them are slow growing tumors. Symptomatic lesions require surgery. Total removal of lesion is usually advised which can be done in single stage or staged manner. Approaching the lesion through posterior laminectomy with unilateral facetectomy exposes the whole tumor and thus can be removed in single stage.

One of factors for subtotal removal of such tumor is adhesion between capsule with surrounding structures, which should be carefully studied prior to surgery [2]. In our patient tumor capsule was in close proximity with posterior aspect of tenth rib on left side, but no adhesion was noted with pleura hence could be removed completely. Although a variety of surgical approaches (anterior or posterior or combined) have been designed to tackle such tumors, single staged midline posterior approach with posterolateral extension still remain a popular choice this approach is technically easy compared to others with good outcomes and well tolerated by patients[3].

Regarding Schwannoma, gross total resection is almost curative. In subtotal resection, recurrence develops after several years. Recurrence is expected at different site only in Neurofibromatosis (NF)2 patients. When recurrence occurs, it reflects malignant character due to distorted anatomy and presence of plethora of adhesions due to previous surgery making it difficult for complete removal [4]. There is no clear-cut consensus on when to do follow up MRI, as recurrence is rare following total resection. But clinicians usually prefer to repeat MRI only in case of reappearance of symptoms, subtotal excision when there is more of cystic component or sometimes as part to document radiological cure. Though follow- up MRI spine has been advised every three months in first six months, followed again at six months interval till one year and then annually to detect any recurrence or any new lesion [5]. In small number of cases so far reported it has most taken the form of epithelioid MPNST [6].

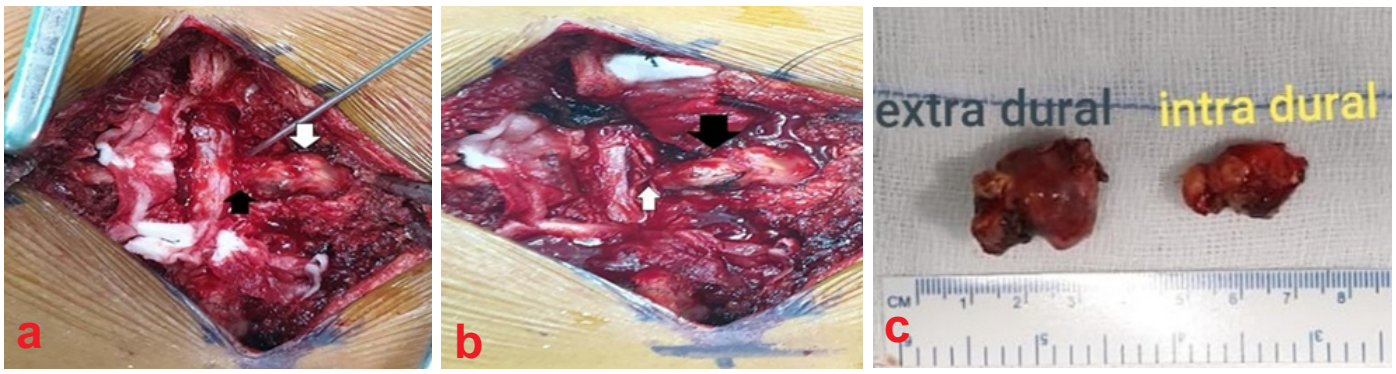


**Figure 2:** (a) Intraoperative image with black arrowhead depicting foraminal component and white arrowhead showing extraforaminal component. (b) Intraoperative image showing intradural component with anatomical preserved nerve root under the tumor marked by white arrowhead and laterally extradural component is depicted by black arrowhead. (c) Resected lesion with intradural and extradural components.

## Conclusion

Schwannoma forms most of Dumbbell shaped tumor. Recurrence is noted only in subtotal resection; therefore, every attempt should be made to remove tumor at first attempt. Schwannoma does not represent a precursor of spindle cell malignant peripheral nerve sheath tumor (MPNST). Malignant transformation of conventional schwannoma is rare.

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