

Circumferential Dural Reconstruction After Excision of Recurrent Intradural Extramedullary Spinal **Meningioma: A Case Report**

Reem Khaled Elwy MBBCh; Heather Pinckard-Dover; Richard McCarthy MD; Rongsheng Cai MD Department of Neurosurgery, University of Arkansas for Medical Sciences Division of Pediatric Neurosurgery, Arkansas Children's Hospital

Introduction

Meningiomas are the most common benign spinal tumor. Surgery is mostly curative however approximately 10% of benign spinal tumors recur[1]. Meningioma recurrence is associated with thecal invasion, degree of resection and histological characteristics of the tumor[2]. Resection of large ventral spinal tumors remains challenging due to greater risk of spinal cord injury and difficult proper tumor exposure. Surgical resection techniques include en-bloc resection of the tumor and involved dura or tumor resection with extensive coagulation of the dural bed[3].

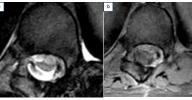
Methods

A neurologically intact 17 year old female presented with intradural extramedullary WHO Grade I recurrent ventral

thoracic spinal meningioma at T10-T11 (Figure 1). En bloc resection was inicated due to adherence of the tumor to its dural bed and due to high likelihood of recurrence in the patient's age group (Figure 2). The resultant 5 centimeter circumferential dural defect necessitated 360 degrees spinal thoracic duraplasty (Figure 3).

T6-L1 posterior spinal fusion was done.

Figure 1



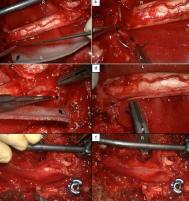
MRI thoracic spine axial cuts. Recurrent lobulated T2WI hyperintense, T1WI contrast enhancing mass at T10 level to the right of the midline (a) and T10/11 ventral and lateral to the left of the midline, entering left T10/11 foramen (b)

Figure 2



Excised tumor and involved dura

Figure 3



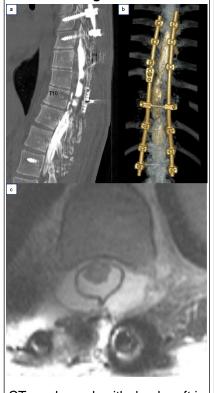
Suturable DuraMatrix passed ventrally to the spinal cord (a); suturing initiated at the ventral surface brought along the left superior edge to midline (b); followed by the inferior edge of the ventral surface along the left side (c). Starting at the superior ventral knot, the superior right edge was sutured to midline followed by the inferior right edge (d). Excess DuraMatrix was excised and midline sutured together (e). Final repair(f). Arrow: DuraMatrix; Arrowhead: dura; R: right; L: left; S: superior; I: inferior

Results

The tumor was totally removed. This was confirmed with dural margine biopsy.

No postoperative cerebrospinal fluid leak (Figure 4) or other complications related to the repair were encountered. Patient returned to baseline neurological status postoperatively.

Figure 4



CT myelograph with dural graft in place at T10/11 and no evidence of CSF leak (a) spinal stabilization hardware from T7-L2 level (b). MRI thoracic spine showing circumferential dural reconstruction with complete removal of tumor

Conclusions

This is the first report of successful circumferential spinal dural repair using synthetic dural graft following resection of recurrent WHO Grade I spinal thoracic meningioma.

Further follow-up will provide long term results of this procedure and further research on the application of this technique in dural repair during different surgeries at all spinal levels is warranted.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe techniques for spinal meningioma resection
- 2) Discuss spinal dural repair methods
- 3) Identify circumferential duraplasty technique and approach

References

- 1. Schick U, Marquardt G, Lorenz R: Recurrence of benign spinal neoplasms. Neurosurg Rev 24:20-25, 2001
- 2. Setzer M, Vatter H, Marquardt G, Seifert V, Vrionis FD: Management of spinal meningiomas: surgical results and a review of the literature. Neurosurg Focus 23:E14, 2007
- 3. King AT, Sharr MM, Gullan RW, Bartlett JR: Spinal meningiomas: a 20year review. Br J Neurosurg 12:521-526, 1998