Case Report

High Cervical Meningioma: A Patient Case Report and Literature Review

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ABSTRACT

Cervical spine meningiomas are uncommon. They present with motor, sensory and other nonspecific symptoms like pain. We present a first case at our hospital. A 33yr old female presented with 5months history of spastic quadriparesis, gait ataxia and pain and forceful contractions of the left upper limb. She had been seen in different health centres and diagnosed as conversion disorder. Brain CT was normal, C-spine CT showed a 2*3cm homogenous lesion at C2-C3.Simpsons 2 resection was done with no complications. Post-operative physical rehabilitation with physiotherapy was instituted with good recovery. By 6 weeks' post-operative, she was ambulating without support.

INTRODUCTION AND LITERATURE REVIEW

The incidence of meningioma's in cervical spine is at 14-27%, lumbar spine 2-14%, rare in sacral and commonest in the thoracic spine. Majority are intra-dural with a small percentage extradural or both intra-dural and extradural. Typically, they arise laterally from arachnoid cap cells in the dural root sleeve. They can also arise from pial or dural fibroblasts accounted for by mesodermal origin. Spinalmeningiomas are 2.5 times more common in women than in men. This is thought to be due to oestrogen and progesterone. In a study by Pravdenkova, he noted that the presence of progesterone receptors alone was associated with a favourable prognosis whereas oestrogen alone or both receptors had a poorer prognosis. [1]

Spinal meningiomas are slow growing and the symptoms largely depend on the degree of cord compression. The usual presentation is with motor, sensory and nonspecific symptoms like pain. There is usually a delay in diagnosis of intra-dural meningiomas due to the failure to consider spinal tumour as a cause of long standing slowly progressive neurological deficits [2]. At diagnosis most patients are unable to walk as they have gait ataxia and weakness. In the literature reviewed, about 21 to 59% of the patients presented with weakness and inability to walk. In a study by Ero et al, gait disturbances were seen in 83% of patients, 39% were Frankel A-C and 47% patient complained of pain. [3]

The current standard diagnostic study for a spinal tumour is MR imaging. An MR image provides exact information about tumour localization (affected segment, relation to spinal cord and nerve root, and relation of the tumour to the dura), the extent of spinal cord compression, and further information about the spinal cord and the tumour itself (presence of cord oedema and intra-tumoural signal changes such as necrosis, hematoma or calcification). [4]

The primary goal of surgery is complete safe tumour removal and decompression of the spinal cord. Dorsally placed tumours can be removed totally with or without resection of the dural attachment. The

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approach should allow wide enough exposure of the tumour and the dural attachment. The most frequent approach has been dorsal, by laminectomy at one level or by hemi-laminectomy at one or two levels with lateral extension when necessary (anterior and anterolateral tumours). This standard approach was used in nearly 100% of the patients in the reviewed studies [4].

There is limited data about the management of malignant spinal meningiomas. Guidelines inferred from experience with intracranial meningiomas recommend attempting maximal resection followed by fractionated external-beam radiotherapy. Radiosurgery maybe indicated in the presence of well-defined remnants on imaging. Chemotherapy for malignant spinal meningiomas has been disappointing, however, hydroxyurea may lead to disease stabilization in a subgroup of recurrent meningiomas. [4] Two cases of successful treatment of spinal meningiomas with liposomal doxorubicin are recorded. [5]

Recurrence rates for spinal meningiomas is very low 0-13%. Mirimanoff et al evaluated meningioma recurrence post resection and found no recurrence in 5years and 13% recurrence at 10years [6]. In another study of 38 patients by Sang Hoon Yoon et al, 10 patients had Simpsons grade1 resections, 17 had grade 2, 4 patients grade 3, and 6 patients grade 4. One patient Simpson grade was unknown. There was no recurrence in Simpson's 1-3 resection. In this study 6cases recurred i.e. 5 cases with grade 4 resection and the case with unknown resection grade. Mean follow up was 100 months. These findings are consistent with other studies and have led to the conclusion that as long as total tumour resection is achieved, there is no need to take the risk of dural origin control. [7]

In a study by C Haeglen, 33 patients with severe preoperative neurological deficits were followed up(20 patients with paraparesis and 13 with paraplegia). By 1-yearpost-operative, all the patients had better neurology than preoperative state and 60% had full recovery. In other literature reviewed, the outcomes were equally very good especially when diagnosis and neurosurgical intervention were done in good time. [8]

DESCRIPTION OF CASE REPORT

A 33yr old black Zambian woman presented to the hospital with a 5months history of progressive muscle weakness in all 4 limbs. The weakness was associated with tremors, muscle spasms and severe on and off muscular pain described as “electric shock like” worse on the left upper limb. She was unable to walk and had been wheelchair bound for 3moths at presentation. There was no history of significant trauma prior to onset of symptoms. She had been seen many times and sent away for psychiatric evaluation. She had no significant medical or surgical history.

Examination

She was well nourished, afebrile, oriented, GCS 15/15. Pupils were normal

Neurological assessment- Equal muscle bulk, intention tremors, increased tone in all limbs, hyperreflexia in elbow, ankle and knee joint. Power in the limbs was 3/5. Sensation was intact.She had a normal proprioception however coordination was poor due to tremors. Babinski was equivocal with a positive clonus.

Other systems were essentially normal.

Investigations

Full blood count and other blood tests were normal.
CT-Brain normal
CT-C-spine- 2*3cm Hyper-dense lesion noted at C1-C3 level. Figure 1.

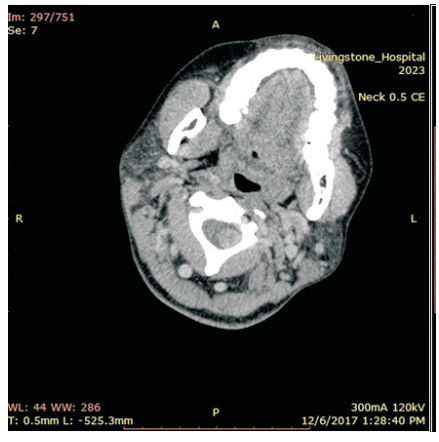

Figure 1 : CT image at C2 showing a hyper-dense lesion (blue arrow) compressing the spinal cord on the left.

Treatment

Admitted and pre-operative care instituted Intra-operatively, a posterior midline approachC3 laminectomy and C2 partial laminectomy was done. Findings- Two round masses attached to each other about 2*3cm and 1*2cm seen to be arising and strongly adherent to the dura(figure 2). The mass was compressing on the spinal cord posterio-lateral to the left.

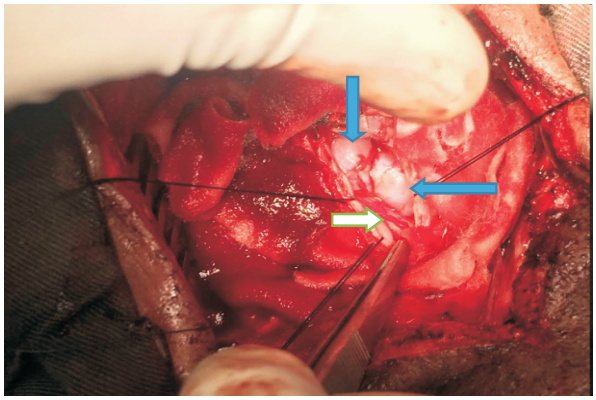

Figure 2: Intraoperative, the meningioma (blue arrows) and the spinal cord (white arrow). Showing compression on the cord.

The mass was bluntly dissected from the spinal cord. Adhesions to the dura separated. Attachment to dura matter cauterised using bipolar diathermy. Mass sent for histopathology.

Dura matter repaired. Para-spinal muscles apposed. Wound closed in 3layers.

Post-operatively, the patient was given: dexamethasone, Tranexamic acid and broad spectrum antibiotics.

No postoperative complications. Day 1 post-operative, she had reduced power in the right upper limb which resolved spontaneously by day 3.

By day 3 post-operative, she reported symptomatic relief with reduced pain sensation and reduced spasms.

By day 5, physical rehabilitation was initiated and the patient was discharged at day8.

At 3weeks, she was recovering well, able to ambulate with minimal support. Physical rehabilitation was continued.

Histopathology: Meningioma WHO grade 1

DISCUSSION

Spinal meningiomas are slow growing tumours which will produce insidious symptoms over a long period of time. The symptoms depend on the size of tumour and the level of compression. The clinical features are mainly motor and sensory. Our patient presented with spastic quadriparesis with pain and sustained painful muscular spasms. At the time of presentation, she was unable to walk. The time from onset of symptoms to diagnosis was about 5 months. Diagnosis was delayed as the possibility of a cervical spine tumour was not considered. She was labelled as conversion hysteria and this led to delayed diagnosis and symptom progression. This delay depending on the duration can predispose to irreversible cord injury due to chronic compression and ischaemia.

The patient had an intra-dural meningioma grade 1. It was onthe left posterolateral to the spinal cord with significant compression. This is in keeping with literature. Intraoperatively, ahemi-laminectomy of C3 and C2 was done. After complete excision of the tumour, the dural attachment was coagulated using bipolar diathermy. As concluded by Soong et al, no risk was taken to excise the dural origin. The post-operative period was unremarkable, withremarkable improvement as early 1 week postop. As observed in literature even in the presence of severe neurological deficits as seen in our patient, neurological prognosis is very good. The role of physiotherapy in physical rehabilitation post operation is invaluable and hence the need for multidisciplinary care.

We are not worried about recurrence of the meningioma in this patient because the meningioma is low grade 1 and a grade 2 Simpson resection was done. Literature shows a very low recurrence rate for low grade meningiomas and Simpson grade 1-3. However, the patient will still be followed up in our neurosurgical outpatient department.

CONCLUSSION

In a patient presenting with slowly progressive neurological deficits, the presence of a spinal meningioma should be considered. Once diagnosis is made, neurosurgical intervention should be prompt with at leastSimpson grade 3 resection to minimise the chances of recurrence. Neurological recovery is very good even in the presence of severe neurological deficit.

REFERENCES

1. Michael A. Galgano et al, Spinal Meningiomas: A review.Journal of spine 2014.
2. Pena M, Galasko CS, Barrie JL. Delay in diagnosis of intradural spinal tumours. Spine. 1992; 17:1110–1116
3. I. Erol Sandalcioglu et al,Spinal Meningiomas: Critical review of 131 surgically treated patients.European Spine Journal. 2008 Aug; 17(8): 1035–1041
4. Matthias Setzer MD et al,Management of spinal meningiomas: Surgical results and a review of the literature. Journal of neurosurgery, 2007
5. Read W.L, Williams F.Recurrent Meningioma of the Cervical Spine, Successfully Treated with Liposomal Doxorubicin.Case Report Oncology. 2017 Jul 14; 10(2):656-659.
6. Mirimanoff RO, Dosoretz DE, Linggood RM, Ojemann RG, Martuza RL, Meningioma: Analysis of recurrence and progression following neurosurgical resection.Journal of Neurosurgery. 1985 Jan; 62(1):18-24.
7. Sang Hoon Yoon et al,Surgical Outcome of Spinal Canal Meningiomas.Journal of Korean Neurosurgical Society. 2007 Oct; 42(4): 300–304.
8. C. Haegelen et al,Results of spinal meningioma surgery in patients with severe preoperative neurological deficits.European Spine Journal. 2005 Jun; 14(5): 440–444.