Mobile Schwannoma of High Cervical Cord: A Case Report and Review of Literature

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ABSTRACT

Background: Although rare, mobile schwannomas have been observed at various vertebral levels. Most of them have been reported within the lumbar spine or thoracic spine. We report a rare case of mobile schwannoma of high cervical spine and only two cases of such in cervical spine have been reported in literature. Case description: We report case of young lady with high cervical spine schwannoma (C3- C4) on preoperative MRI imaging. Intra-operatively to our surprise we could not find the tumor at C3-4 and had migrated cranially upto C2-3. Partial C2 laminectomy was done to excise the tumour completely. She recovered with no deficit. Conclusion: Mobile cervical tumors are a rare entity. There are many predisposing factors for tumours to migrate. In our case we presume that prone positing along with slight flexion may have caused the tumour to migrate cranially. One should always be prepared for negative exploration.

Keywords: Mobile Schwannomas, Intradural extramedullary, Cervical

1. INTRODUCTION

Schwannomas of the spine are mostly solitary and can occur throughout the spinal cord.¹ They account for 25% of intradural extramedullary spinal cord tumors²³⁴⁵⁶. The incidence of migration of intradural extramedullary tumours has been rare. Tomimatsu et al.⁷¹ in 1974 have first reported a mobile schwannoma of cervical cord. The most common tumour to migrate was schwannoma, although, cases of neurenteric cyst and ependymomas have been reported. Most of them have been reported either from the lumbar spine or dorsal spine. Migration of tumors was attributed to postural change, redundant nerve root, thrust of radio opaque material during myelography⁸⁹¹⁰¹¹¹².

2. CASE REPORT

A 37 years old lady presented with mild neck pain and intermittent numbness of all limbs for 6 months. There was no associated radiating pain, weakness of any limb or bowel & bladder involvement. Neurological examination was essentially normal except exaggerated upper limb & lower limb reflexes on the right side. There were no neurocutaneous markers. MRI cervical spine plain and contrast revealed 1.0 x 0.6 cm intradural-extramedullary, T1
hypointense, T2 hyperintense and brilliantly contrast enhancing tumor in the antero-lateral aspect, indenting the cord on the right side at C3-4 vertebral level (Figures 1 & 2).

Figure 1a: Preoperative contrast MRI sagittal section shows homogenously enhancing intradural extramedullary lesion at C3-4 level

Figure 1b: Preoperative contrast MRI axial section shows homogenously enhancing intradural extramedullary lesion at C3-4 level lesion indenting the thecal sac on the antero-lateral side

Patient was taken to operating room for excision of tumor. After intubation and proper ventilation, the patient was made prone and head fixed in Mayfield holder. A C3 and C4 laminectomy was performed. Midline durotomy was performed. Dentate ligaments were cut on the right side to so as to mobilize the cord towards left and arachnoid hitch was taken. To our surprise we could not find the tumour and the cord was appearing normal, there was no bulge. We probed cranially as well as caudally with Penfield dissector along with Valsalva maneuver and we could feel the caudal end of the tumor cranially at the level of mid C2 vertebral level. Partial C2 laminectomy was done and durotomy extended cranially. The tumour was identified which was yellowish, soft, well circumscribed attached to redundant nerve root. There was no attachment to the dural surface. Complete excision of the tumor was done. Post operatively she recovered well with no fresh neurological deficits. Her neck pain and numbness were relieved. She was ambulated next day and discharged on 3rd post operative day. The

Figure 2a: Intraoperative photograph showing C3 - C4 laminectomy status where no tumour was found

Figure 2b: Intraoperative photograph extended partial C2 laminectomy status with migrated tumour at the level of C2 – C3

3. DISCUSSION

Migration of spinal tumours have been reported in literature. They are mostly seen in lumbar region. Wortzman and Botterel13 in 1963 were the first to describe mobile tumor in the cauda equina. However, migration of tumour in the cervical spine is a rare entity, as there is less subarachnoid space and shorter nerve roots as compared to lumbar spine where there is more subarachnoid space and long nerve roots. Migration of tumors has many possible mechanisms. They are mostly attributed to postural change, redundant nerve root, thrust of radiopaque material during myelography8,9,10,11,12 and laminectomy procedure itself14,15.

There is only one case reported in literature where cervical tumor has migrated cranially. First case of migration of cervical tumor was reported by Tomimatsu et al.7 in 1974, where the tumor migrated cranially from C4-6 to C2-4 level. The discrepancy was of two vertebral levels. They have used intraoperative myelography for tumor location.

We report a second case of ours where a high cervical intradural extramedullary schwannoma at the level of C3-C4 has migrated cranially to C2-C3 level, a segment higher than preoperative imaging.

There have been few cases where cervical tumor have migrated to thoracic levels. Lizuka et al.16 in 1998 have reported a case where the initial tumor location was involving C7-T1 vertebral level and had migrated to T1-T2 level with vertebral discrepancy of one vertebral level. They used intra-operative MRI as well as myelography to localize the tumor intra-operatively.

Terada et al.17 have recently published a mobile schwannoma of lower cervical level where the tumour has migrated from C5-7 to C6-T1. The discrepancy was of two levels. They have used intra-operative ultrasound and MRI.

We found from the literature that higher cervical levels have migrated cranially and lower cervical tumours have migrated caudally (Table 1). All the cases reported in literature pertaining to cervico-thoracic spine were histologically schwannomas.

Table 1. Summary of published cases of cervical mobile tumours

<table>
<thead>
<tr>
<th>Author and year</th>
<th>Age/sex</th>
<th>Initial location</th>
<th>Final location</th>
<th>Vertebral discrepancy</th>
<th>Migration</th>
<th>Imaging/modality used during surgery</th>
<th>Type of tumour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomimatsu et al., 1974</td>
<td>47/M</td>
<td>C4-6</td>
<td>C2-4</td>
<td>2</td>
<td>Cranial</td>
<td>Myelography</td>
<td>Schwannoma</td>
</tr>
<tr>
<td>Lizuka et al, 1998</td>
<td>48/M</td>
<td>C7-T1</td>
<td>T1-T2</td>
<td>1</td>
<td>Caudal</td>
<td>MRI, Intraop-Myelography</td>
<td>Schwannoma</td>
</tr>
<tr>
<td>Terada et al, 2016</td>
<td>68/M</td>
<td>C5-C7</td>
<td>C6-T1</td>
<td>2</td>
<td>Caudal</td>
<td>MRI, Intraop-USG</td>
<td>Schwannoma</td>
</tr>
<tr>
<td>Present case</td>
<td>37/F</td>
<td>C3-4</td>
<td>C2-3</td>
<td>1</td>
<td>Cranial</td>
<td>None</td>
<td>Schwannoma</td>
</tr>
</tbody>
</table>

We found in the literature, mostly the migration of tumour of spinal axis is of single or two vertebral level and rarely more than two. But in higher cervical it was never more than two level migration.

We were in an impression that traction on the upper cervical nerves secondary to flexion of neck, prone position and laminectomy procedure itself might have migrated the tumor cranially in our case. The predictors for intra-operative tumours localization are cord bulge and engorged epidural/pial vessels. Use of Penfield dissector after proper release of dentate ligaments along with Valsalva maneuver in case of negative exploration, where intra-operative modalities are unavailable is a helpful technique. It is also important to be careful while mobilizing the cord as it could be disastrous. If tumour is found, laminectomy can be extended accordingly. We suggest using intra-operative ultrasound, myelography and intra-operative MRI to be used where facilities are available.

4. CONCLUSION

Mobile cervical tumors are a rare entity. To our knowledge there is only one case reported in literature where high cervical tumor has migrated cranially. We add to the literature another mobile cervical
schwannoma which has migrated cranially. Use of Penfield dissector along with Valsalva maneuver is a valuable technique when intra operative MRI and ultrasonography are not available. Care should be taken to mobilize the cord by cutting dentate ligaments and look for cord changes. It is important to be prepared for negative exploration and use intraoperative ultrasonography or intra operative MRI when facilities are available.

REFERENCES