CASE REPORT

Double migration of a schwannoma of thoracic spine

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SUMMARY

Mobile intraspinal tumours have rarely been reported. In most cases, mobile tumours such as schwannomas or ependymomas were located in the cauda equina. Perusal of the literature revealed only two reports of mobile schwannomas in the cervical and thoracic regions. We report a case of thoracic schwannoma which migrated twice in successive operations resulting in negative exploration in the expected area. The aim of this report is to remind the surgeons about the possibility of migration of intradural-extramedullary tumour.

BACKGROUND

Cases of spinal cord schwannomas migrating to several levels have been known to occur. Tomimatsu first reported a mobile schwannoma of the cervical cord in 1974.¹ However, there have been a very small number of cases and the incidence has been very rare.¹ The migration of a tumour in the spinal canal was also observed at our institute. Therefore, in this report, we document this rare case with brief literature review. The most common tumour type among the mobile spinal tumours was schwannoma, although there have been reports of neurenteric cyst and ependymomas. Schwannoma is a neurogenic tumour, which arises from nerve sheath such that it is relatively well marginated with little attachment or adhesion to surrounding tissue. Changes in the level of a schwannoma may be related to differences in the patient's body position during MRI and surgery. Normally, the nerve roots have considerable slack when the lumbar spine and hips are in extension. A 'redundant' root would allow even more mobility of an attached tumour.²

We present a case in which there was considerable discrepancy between the localisation of the tumour at MRI and the findings at both initial surgery and repeat MRI, and second surgery.

CASE PRESENTATION

A 52-year-old man presented with low-back pain of 15 years, paraparesis of 3 years and difficulty in micturition of one and a half month. He was referred to us from a different hospital where he presented with retention of urine and was diagnosed as a case of intradural-extramedullary (IDEM). At the time of admission in our hospital his condition was improving and he could pass urine though his motor symptoms remained same.

On examination, the patient had spastic gait, increased tone and a decreased muscle power of Medical Research Council (MRC) grade 3 in both

lower limbs. Both knee and ankle jerks were exaggerated with an equivocal planter response. The sensory level was at dorsal 10 (D10).

INVESTIGATIONS

The MRI of the spine showed a relatively well-circumscribed, homogeneous, strongly enhancing oval mass, measuring approximately 40×7.5 mm at the anterior aspect of the spinal cord at the T10–11 vertebral level without any evidence of extradural extension through foramina (figure 1).

TREATMENT

A T9–11 laminectomy was performed and the normal appearing dura mater was opened in the midline. Intradurally, the region of the spinal cord had a normal appearance. Microdissection showed no tumour-like tissue associated with the dura, arachnoid, or neural elements. With a view that the last vertebra with the rib may be the 11th rather than the 12th thoracic vertebra the laminectomy was extended caudally. Again, no tumour could be visualised. In view of the extension of the laminectomy, which had already exceeded three levels, it was decided to postpone further exploration.

After the operation the patient's low-back pain increased in the absence of neurological deterioration. Repeat MRI was performed on 2nd post-operative day and it showed that the tumour had migrated upwards with the cranial end at T6–7 disc level and the caudal end at mid-T8 body with a discrepancy of three vertebral levels (7 cm; figure 2).

At reoperation after 6 days from the first surgery, the laminectomy was extended up to T7. After resection of dentate ligaments, the cord was mobilised but surprisingly the tumour was not found. After much thinking the previous T10–11 levels were reexplored. The tumour was deeply situated ventral to the cord at the level of T11. It was not connected to dural membrane. A well-capsulated mobile tumour was exposed. The mass was attached to somewhat redundant nerve roots at both rostral and caudal ends. The tumour was completely removed (figure 3). Histological examination revealed it to be a schwannoma.

OUTCOME AND FOLLOW-UP

The postoperative course was uneventful. The pain in the back and the legs was significantly reduced. The patient was discharged 12 days after the second surgery. At his 3-month postoperative evaluation, the patient had regained full strength in the lower extremities.

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Figure 1 First MRI of the patient showing a relatively well-circumscribed, homogeneous, strongly enhancing oval mass (black arrow in A and white arrow in B) at the anterior aspect of the spinal cord at the T10–11 vertebral level without any evidence of extradural extension through foramina.

Figure 2 Second MRI showing tumour migration upwards with the cranial end at T6–7 disc level and the caudal end at mid-T8 body (white arrows in A and B) and signs of previous surgery (black arrow in A).

DISCUSSION

The present case is unique to the literature in two aspects. First, the majority of mobile schwannomas of the spinal cord are in the lumbar area;¹ there have only been three reports of mobile thoracic schwannomas in the literature (Namura, Isu and Kim).^{1 3 4} Second, there has been no previous report of double negative exploration in the expected level of mobile schwannoma. Our literature search

showed that only Namura *et al*³ and Kim *et al*¹ described a purely thoracic mobile schwannoma with Isu *et al*⁴ describing mobile lower dorsal thoracic schwannomas migrating to thoraco-lumbar and lumbar region.

In the present case the first MRI (figure 1) showed the tumour's cranial end at T9–10 disc level and caudal end at T11 body and the second MRI showed the tumour's cranial end at

Figure 3 Peroperative picture showing the caudal end of the tumour (black arrow).

T6–7 disc level and caudal end at T8 body. During the second operation a reexploration was done at T7–8 level; the dentate ligament was cut and the tumour searched was ventral to the cord as seen in the second MRI (figure 2). As no tumour was found we decided to reopen the previous wound and to our relief we found the tumour at its initial site. This unique finding of discrepancy between peroperative finding and preoperative MRI in two successive occasions in the same tumour has not been mentioned in the literature previously.

It is difficult to explain the discrepancy of tumour location between the preoperative studies and intraoperative findings. Possible mechanisms of tumour mobility include dilatation of the subarachnoid space attributable to spinal cord deformity induced by extramedullary tumour and laxity of the nerve root by tension resulting from tumour weight.^{3 5 6}

Other mechanisms have been proposed in the literature for the mobility of extramedullary tumours including postural changes,^{1 2 4 6–10} thrust of injected radiopaque material during myelography,^{1 7 9} Valsalva manoeuvre due to straining at the time of micturition or defaecation,^{1 3 6} or even laminectomy procedure.^{3 6}

Several preventive measures were suggested, such as preoperative repeated MRI³ or myelography,³ intraoperative myelography,^{3 7} intraoperative ultrasonography^{6 8} or even intraoperative MRI. Intraoperative myelography has a shortcoming that injection of dye itself can cause displacement of tumour.^{1 7 9} Intraoperative MRI can be done only in an equipped hospital. Although intraoperative ultrasound seems to be the most convenient diagnostic method to find hidden or moved tumours,

even it can result in negative exploration. In this case Valsalva manoeuvre may help in visualisation of tumour.¹¹ In our setting where there is no scope of intraoperative imaging, Valsalva manoeuvre and clinical instinct may be the only resorts.

The purpose of this report is to remind clinicians that it is possible for certain tumours attached to the roots in the spinal canal to migrate. Multilevel search at times is necessary for the management of these tumours.

Learning points

- ▶ Although rare, spinal schwannomas have a tendency to migrate leading to negative exploration of the spine, and thus the surgeon needs to be vigilant regarding this.
- ▶ If the surgeon faces a similar event, Valsalva manoeuvre or intraoperative ultrasound may be helpful.

Competing interests None.

Patient consent Obtained.

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