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Title:

Dorsal root entry zone approach in spinal intramedullary tumours: A revisit and review of the technique

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Abstract:

Introduction

Surgical excision is the mainstay treatment for the intramedullary spinal cord tumour. However, when no tumour exposed on the surface of the spinal cord in this kind of tumour, myelotomy is required. Median myelotomy (MM) is the standard approach to be described in the literatures, but we did encounter complications probably related to this approach solely. After such incidents, we adopted the dorsal root entry zone myelotomy (DREZM) approach in the surgery treating these intramedullary tumours.

Objective

To compare the surgical result of the completely intramedullary spinal cord ependymoma with MM approach and DREZM approach.

Method

Retrospective review of the patients diagnosed to have completely intramedullary spinal cord ependymoma (WHO grade II) who are treated surgically in the Department of Neurosurgery, Queen Mary Hospital from 2001 to 2013. Patients with myxopapillary ependymoma, which occurs exclusively in the conus medullaris and filum terminale, were excluded. Also excluded are those patients with anaplastic ependymoma or ependymoblastoma or other pathologies, other condition(s) jeopardising the neurological function, recurrent disease or previous history of other spinal surgery(s). Pre- and post-operative neurological condition and functional status, and intra-operative neurophysiological monitoring were compared in the MM approach group and the DREZM approach group.

Result

From 2001 to 2013, there have 12 patients been operated on for completely intramedullary spinal cord tumour. All of these tumours were confirmed with pathologically as ependymoma (WHO grade II). 6 patients (50%) were operated with MM approach and 6 patients (50%) were in the DREZM approach group. The mean FU time is 73 months. Only one patient (16.7%) had subtotal resection achieved in the MM group; whereas in the DREZM group, all the the patients achieved gross total resection as confirmed by post-operative MRI scan. Intra-operative neurophysiological monitoring was employed in all patients, only one patient in the MM group (16.7%) found to have depressed SSEP and MEP signals intra-operatively. None of the patients in the DREZM group was found to have any intra-operative neurophysiological monitoring depression. In the MM group, the long term result was found unsatisfactory in 2 patients (33%). In one patient, 6 years post-operative, she developed significant bilateral myelopathy with evidence of major cord atrophy but not degenerative changes noted in the cervical spine MRI scan. The other patient can only walk with frame for short distance due to bilateral lower limbs proprioception deficit. In the DREZM group, all patients have satisfactory long term functional outcome. All of them only noted numbness or loss of temperature sensation at the dermatomes affected by the myelotomy, but none of them complains of mobility problem or incapability to work.

Conclusion

DREZM approach is found to be a feasible and convenient way of myelotomy. Its surgical result is proven to be as good as the conventional MM approach if not better.