Anterior To Dorsal Root Entry Zone Myelotomy (Adrezotomy): A New Surgical Approach For The Treatment Of Ventrolateral Deep Spinal Cord Vascular Malformations

Hongqi Zhang, Feng Ling, Tao Hong, Chuan He, Ming Ye, Liyong Sun, Xiaoyu Li, Yongjie Ma, Jiaxing Yu, Jian Ren

Department of Neurosurgery, Xuanwu Hospital, Capital Medical University, China International Neuroscience Institute, Beijing, China.

Background:
Surgical removal of ventrolateral deep intramedullary spinal cord vascular malformations is highly risky and remains problematic.

Objective:
To confirm the feasibility of using anterior to dorsal root entry zone myelotomy (ADREZotomy), a new surgical approach, for the treatment of ventrolateral deep spinal cord vascular malformations.

Methods:
The authors performed a retrospective study exploring the surgical removal of ventrolateral intrinsic spinal cord vascular malformations using ADREZotomy in 23 patients, including 15 spinal cord cavernous malformations (SCCMs) and 8 spinal cord arteriovenous malformations (SAVMs). American Spinal Injury Association (ASIA) grade was used to evaluate the patients' neurological function at the preoperative, postoperative and follow-up stages. The indication, operative steps, complications, and anatomical basis of the myelotomies were described and discussed.

Results:
In total, gross total resections were performed in 20 (87.0%) patients. Partial resections were performed in 3 (13.0%) patients (all were SAVMs). Immediately after surgery, the neurological function of 20 (87.0%) patients remained the same. One (4.3%) patient improved (SCCMs) and 2 (8.7%) patient worsened (all were SAVMs). There were no other immediate or delayed complications related to the surgical procedure. Compared with preoperative neurological function, the follow-up outcomes showed that 20 (87.0%) patients were stable, 2 (8.7%) patients improved (all were SCCMs), and 1 (4.3%) patient worsened (SAVMs).

Conclusion:
Surgical removal of ventrolateral deep spinal cord vascular malformations can be feasible using proper surgical techniques. ADREZotomy is a minimally invasive technique for the removal of ventrolateral deep lesions, without disrupting the important spinal cord tracts or the need to broadly expose bone.