Microvascular decompression case series

2019

To explore the guidance value of preoperative 3-dimensional brain volume (3D-BRAVO) and 3-dimensional time-of-flight (3D-TOF) MRA scanning for microvascular decompression.

One hundred thirteen patients treated with microvascular decompression from February 2016 to February 2018 in the First Affiliated Hospital of Dalian Medical University were retrospectively analyzed. All patients received 3D-BRAVO combined with 3D-TOF MRA sequence reconstruction before the operation. The anatomical relationship of neurovascular tissues was analyzed and compared with the results of intraoperative exploration.

The results of MVD showed that the number of positive cases was 108 (95.6%) on the diseased side. 3D-BRAVO combined with 3D-TOF sequence reconstruction resulted in 106 positive cases (93.8%), with a 98.1% positive coincidence rate and a 13.2% false positive rate ($p < 0.05$). 3D-BRAVO-TOF sequence reconstruction of trigeminal neuralgia showed a positive coincidence in 78 cases (92.8%) and for hemifacial spasm a positive coincidence was found in 27 cases (93.1%).

3D-BRAVO combined with 3D-TOF sequence reconstruction before microvascular decompression can fully evaluate the morphology, location, and anatomical relationship of lesions, which is of guidance value for clinical diagnosis and treatment [1)].

Hyperactive dysfunction syndrome (HDS) of the cranial nerves, such as trigeminal neuralgia (TN), hemifacial spasm (HFS), and glossopharyngeal neuralgia (GPN), are commonly managed via microsurgery. However, certain cases may present a combination of these syndromes in the neurosurgery department.

Zhang et al., aimed to retrospectively assess patients with combined HDS from a single center.

Of 1275 consecutive patients with HDS treated at the center between 2007 and 2017, 37 patients with combined HDS were enrolled, and their medical and surgical records were analyzed.

The patients with combined HDS, accounting for 2.9% of all patients with HDS, included 22 cases with bilateral TN, 5 cases with TN-HFS, 8 cases with TN-GPN, and 2 cases with GPN-HFS. A comparison of patients with single and combined HDS indicated a significant difference in the mean age at initial diagnosis (63.57 vs 56.18 years, P=0.000), but no such difference in the sex ratio (0.54 vs. 0.59, P=0.865) or incidence of hypertension (32.43% vs. 24.56%, P=0.274). In total, 32 microvascular decompression (MVD) procedures were performed in the 27 patients with combined HDS, and repeat MVD was required in 5 patients with bilateral TN. Of the 27 patients who underwent MVD, 25 (92.6%) exhibited clinical cure or obvious alleviation.

Combined Hyperactive dysfunction syndrome (HDS) involves a group of functional disturbance disorders affecting specific cranial nerves, and may include TN, HFS, and GPN. In addition to gender and hypertension incidence, age appeared to be a vital parameter for developing combined HDS, although this finding was inconsistent in previous studies. MVD appears to be a safe and effective treatment for combined HDS, with a high rate of long-term success [2)].

2018

Park et al. conducted a pre-post study to compare postoperative gas exchange with different intraoperative oxygen fractions. From April 2010 to June 2017, 1456 consecutive patients who underwent MVD were enrolled. Starting in January 2014, routine oxygen fraction was lowered from 1.0 to 0.3 during anesthetic induction/awakening and from 0.5 to 0.3 during anesthetic maintenance. Postoperative gas exchange, presented as the minimum value of PaO2/FIO2 ratio within 48 hours, were compared along with adverse events.

Among 1456 patients, 623 (42.8%) patients were stratified into group H (high FIO2) and 833 (57.2%) patients into group L (low FIO2). Intraoperative positive end-expiratory pressure was used in 126 (15.1%) patients in group H and 90 (14.4%) patients in group L ($p = 0.77$).The minimum value of PaO2/ FIO2 ratio within 48 hours after surgery was significantly greater in the group L (226.13 vs. 323.12; $p < 0.001$) without increasing any adverse events.

In patients undergoing MVD, lowering routine FIO2 and avoiding 100% O2 improved postoperative gas exchange [3].

Bartek et al., conducted a retrospective review of 98 adult patients (≥16 years) treated with MVD between 1 January 1994 and 1 June 2013. Adverse events occurring within 30 days were classified according to the Landriel Ibañez classification for neurosurgical complications: grade I represents any non-life threatening complication treated without invasive procedures; grade II is complications requiring invasive management; grade III is life-threatening adverse events requiring treatment in an intensive care unit (ICU); grade IV is death as a result of complications. We sought to compare our results with reports from the literature.

Patients' median age was 61 years (range 26-83), and 64 (65 %) were females. Indications for MVD were trigeminal neuralgia (n = 77, 79 %), glossopharyngeal neuralgia (n = 4, 4 %), hemifacial spasm (n = 16, 16 %) and combined trigeminal neuralgia and hemifacial spasm (n = 1, 1 %). The overall 30-day complication rate was 20 %, with 14 % grade I complications, 5 % grade II complications and 1 % grade III complications. The comparison with the literature was hampered by the diverse and unsystematic way of reporting complications.

They provide a standardized report of postoperative complications in a consecutive patient series undergoing MVD. Due to the heterogeneous and non-standardized reporting of complications in the literature, it is difficult to know if the 20 % complication rate is low or high. Standardized reporting is a necessity for meaningful and more valid comparisons across studies. The safety of MVD, a fairly standardized neurosurgical procedure, is well suited for comparisons across centers provided that complications are reported in a standardized manner [4].

1)
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2)
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S1878-8750(19)31514-1. doi: 10.1016/j.wneu.2019.05.237. [Epub ahead of print] PubMed PMID: 31158546.

3)

Park J, Min JJ, Kim SJ, Ahn JH, Kim K, Lee JH, Park K, Chung IS. Effects of lowering inspiratory oxygen fraction during microvascular decompression on postoperative gas exchange: A pre-post study. PLoS One. 2018 Nov 14;13(11):e0206371. doi: 10.1371/journal.pone.0206371. eCollection 2018. PubMed PMID: 30427854.

4)

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