

Bilateral Middle Cerebral Artery Aneurysm

Bilateral [Middle Cerebral Artery Aneurysm](#) located between the 2 [middle cerebral artery](#) (MCA) bifurcations may be approachable through a single unilateral approach.

The best surgical method for the treatment of patients with bilateral middle cerebral artery (bMCA) aneurysms has not been fully determined yet.

Case series

2015

From January 1998 to December 2013, Andrade-Barazarte et al. retrospectively identified 173 patients with bilateral intracranial aneurysms. Fifty-one patients had bilateral MCA aneurysms. A total of 38 patients underwent a single craniotomy with a contralateral microsurgical approach (group 1 or contralateral group) and 13 patients underwent bilateral craniotomies (group 2 or bilateral group). For both groups, they analyzed aneurysm characteristics, morphology, size, projections, and distance to the contralateral corridor, as well as surgical time, outcome, and postoperative complications.

All aneurysms approached contralaterally were unruptured and without wall calcifications. Of the contralaterally approached aneurysms, 97% were smaller than 14 mm. The median length of the contralateral A1 was 13.2 mm (range: 6-19.8 mm) and the median length of the contralateral M1 was 14.2 mm (range: 4.6-21 mm). The contralateral group had a good postoperative outcome ([modified Rankin Scale](#) 0-3) in 80% of ruptured cases and 86% of unruptured cases. The median surgical time was 120 minutes (range: 75-255 minutes), 43% shorter than the bilateral group.

The contralateral approach for bilateral MCA aneurysms in selected patients is feasible in experienced hands, with acceptable morbidity and mortality. The contralateral approach requires a meticulous preoperative analysis of the characteristics of the aneurysms to be clipped and of the anatomic constraints of the microsurgical operative corridor ¹⁾.

2012

Between January 2001 and June 2010, 22 patients with bMCA aneurysms were surgically treated.

In 12 cases (54.5 %), ipsilateral and contralateral MCA aneurysms were successfully clipped via unilateral approach. In the remaining 10 cases, bilateral approach was necessary because of some technical difficulties. Although the surgical results were almost the same, mean operation time and mean hospital stay were, respectively, 46 and 37 % shorter and mean cost per person was 23 % lower for the patients in the unilateral group. In addition, the severity of brain edema, total length of the contralateral (A1+M1) segment, and the configuration of contralateral aneurysm were found to be the determinant parameters affecting the feasibility of the unilateral approach.

This is the first study in the literature that compares the clinical outcomes of unilateral and bilateral approaches to bMCA aneurysms. The results of surgery for both approaches are almost the same. However, the unilateral approach has certain advantages compared to the bilateral approach. Therefore, the unilateral approach may be a good alternative in surgical management of patients with

bMCA aneurysms in selected cases and the abovementioned parameters can help the neurosurgeon in patient selection ²⁾.

2010

Five patients aged 55 to 73 years (mean 63 years) underwent one-stage clipping for unruptured aneurysms in the bilateral middle cerebral arteries (mean size 4.5 mm, range 2 to 7 mm) via the bilateral pterional keyhole approach.

Important points are as follows: the head is affixed with no rotation; one side manipulation is started 5 minutes after the other side to avoid conflict of surgical instruments; a 5-cm curvilinear skin incision is made inside the hairline and pterional keyhole craniotomy is made bilaterally using 2 burr holes; the whole operating table is rotated 15 degrees to one side to facilitate the microsurgical trans-sylvian approach and aneurysm clipping; the operating table is rotated to the other side for the contralateral procedure; and particular care is taken to avoid bilateral brain injury. This approach provided minimum but sufficient working space required for trans-sylvian dissection. Aneurysm neck clipping was safely performed in a mean operation time of 5 hours 17 minutes. No complications occurred and satisfactory cosmetic results were obtained in all patients. Postoperative neuroimaging studies exhibited bilateral complete clipping with minimal intracranial air content and minimum consequences of brain retraction. One-stage clipping via the pterional keyhole approach is a safe and effective therapeutic option for small bilateral aneurysms ³⁾.

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Andrade-Barazarte H, Kivelev J, Goehre F, Jahromi BR, Noda K, Ibrahim TF, Kivisaari R, Lehto H, Niemela M, Jääskeläinen JE, Hernesniemi JA. Contralateral Approach to Bilateral Middle Cerebral Artery Aneurysms: Comparative Study, Angiographic Analysis, and Surgical Results. *Neurosurgery*. 2015 Dec;77(6):916-26. doi: 10.1227/NEU.0000000000000930. PubMed PMID: 26308631.

²⁾

Inci S, Akbay A, Ozgen T. Bilateral middle cerebral artery aneurysms: a comparative study of unilateral and bilateral approaches. *Neurosurg Rev*. 2012 Oct;35(4):505-17; discussion 517-8. doi: 10.1007/s10143-012-0392-3. Epub 2012 May 12. PubMed PMID: 22580988.

³⁾

Maruyama K, Kurita H, Yamaguchi R, Noguchi A, Shiokawa Y. One-stage clipping of bilateral middle cerebral artery aneurysms via the bilateral pterional keyhole approach. *Neurol Med Chir (Tokyo)*. 2013;53(3):148-52. PubMed PMID: 23524497.

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Last update: **2024/06/07 02:49**

