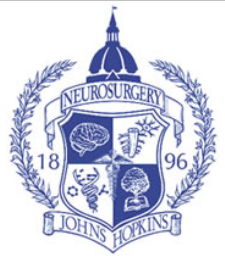




The contralateral approach is a safe alternative to a staged approach for treating bilateral anterior circulation aneurysms

Jacob James Ruzevick; Justin M. Caplan MD; Wuyang Yang; Gustavo Pradilla MD; Geoffrey P. Colby MD PhD; Alexander Lewis Coon MD; Judy Huang MD; Rafael J. Tamargo MD
The Johns Hopkins University School of Medicine, Department of Neurological Surgery



Introduction

The prevalence of multiple intracranial aneurysms in the general population ranges from 5-34%. Treatment of these aneurysms, especially when they are bilateral, presents a unique decision challenge to the treating neurosurgeon. Ideally, patients with multiple aneurysms would be treated with a single intervention rather than multiple surgeries in order to prevent the morbidity associated with a second procedure. The contralateral approach, originally reported by Yasargil in 1977 and Nakao in 1981, is an elegant surgical solution to treating multiple bilateral supratentorial aneurysms in a single operation as opposed to a staged approach. However data regarding the safety and efficacy of this approach still remains controversial.

Methods

We retrospectively reviewed a prospectively maintained, IRB-approved institutional aneurysm database from 1991-2014 to identify all patients treated by the senior author (RJT) with bilateral anterior circulation aneurysms in locations previously shown to be amenable to the contralateral approach.

Methods (CONTINUED)

Aneurysms arising from the anterior communicating artery or basilar artery regions are considered midline, thus only patients with co-existing bilateral aneurysms of the anterior circulation were included. Patients underwent either 1) the contralateral approach or 2) a staged approach for treatment of all aneurysms. Records were reviewed for demographic data, aneurysm location, subarachnoid hemorrhage (SAH) status, Hunt & Hess grade, use of temporary clipping, aneurysm location, Glasgow coma scale (GCS), Glasgow outcome scale (GOS), and post-operative complications.

Statistical analysis was performed using R Statistical Software (Version 3.0.1, 2013, Vienna, Austria). For continuous variables, student's t-test was used for variables with Gaussian distribution, and Wilcoxon's Rank Sum test was used for variables with non-Gaussian distribution. Chi-square test was performed for categorical variables. Statistical significant was defined as $p < 0.05$. All p-values are reported as two sided.

Results

A total of 109 patients underwent either the contralateral (n=50) or staged (n=59) approach to treat a total of 124 and 157 aneurysms, respectively. There was no difference between groups for age ($p=0.33$), sex ($p=0.18$), race ($p>0.99$), number of aneurysms ($p>0.99$), Hunt & Hess grade ($p=0.72$), or use of temporary clipping ($p=0.52$). SAH was more common in patients undergoing a staged approach ($p<0.01$).

There was no difference in the number of postoperative complications in those patients undergoing the contralateral approach versus a staged approach for unruptured aneurysms ($p=0.08$) or SAH ($p=0.22$). Likewise, there was no difference in 30-day readmission rates for patients undergoing the contralateral approach versus a staged approach for unruptured aneurysms ($p>0.99$) or SAH ($p=0.40$).

Results (CONTINUED)

Outcomes, as measured by GOS at discharge and short-term follow-up (typically occurring 4-8 weeks post-operatively), were the same regardless of treatment approach for unruptured aneurysms ($p=0.52$, $p=0.49$ respectively). The GOS at discharge in patients with SAH was similar between those patients undergoing the contralateral versus staged approach ($p=0.79$) but was significantly improved in patients initially presenting with SAH undergoing the contralateral approach at short-term follow-up ($p<0.05$). There was no difference though at long term follow-up ($p=0.32$).

Conclusions

For patients with bilateral anterior circulation aneurysms, the contralateral approach represents a safe alternative to a staged approach and allows for obliteration of multiple bilateral supratentorial aneurysms with a single surgery. Compared to a staged approach, the outcomes of patients undergoing a contralateral approach are similar in patients with either unruptured aneurysms or SAH.

Learning Objectives

By the conclusion of this session, participants should be able to identify that the outcomes of the contralateral approach are similar to a staged approach for the treatment of bilateral anterior circulation aneurysms.

References

- Yasargil MG, Gasser JC, Hodosh RM, Rankin TV: Carotid-ophthalmic aneurysms: direct microsurgical approach. *Surg Neurol* 8:155-165, 1977
- Nakao S, Kikuchi H, Takahashi N: Successful clipping of carotid-ophthalmic aneurysms through a contralateral pterional approach. Report of two cases. *J Neurosurg* 54:532-536, 1981
- Oshiro EM, Rini DA, Tamargo RJ: Contralateral approaches to bilateral cerebral aneurysms: a microsurgical anatomical study. *J Neurosurg* 87:163-169, 1997
- Clatterbuck RE, Tamargo RJ: Contralateral approaches to multiple cerebral aneurysms. *Neurosurgery* 57:160-3-discussion 160-3, 2005