

Comparison of Surgical and Conservative Management for Moyamoya Disease in a North American Cohort

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Introduction

Comparative outcomes following surgical and conservative management of moyamoya disease(MMD) in a non-Asian population are rarely reported. We aim to elucidate the role of revascularization surgery in preventing ipsilateral strokes in a North American cohort with MMD.

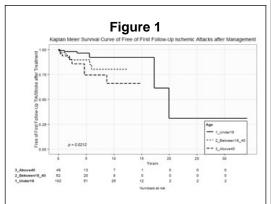
Methods

We performed a retrospective review of MMD patients at the Johns Hopkins Medical Institutions from 1990-2014. Patient information was analyzed on a per-hemisphere basis, and compared between surgically treated(group1) and conservatively managed patients(group2). Significant factors were included into a multivariate logistic regression analysis(MVA), with the outcome defined as stroke occurrence during follow-up.

Results

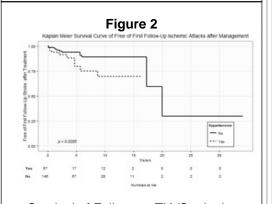
A total of 115 patients with 214 affected hemispheres were included. The average age of all patients was 24.4±17.8 years, with 73.9%(n=85) being female. Race distribution was: White(n=46,40.0%), Black(n=32,27.8%), Asian(n=24,20.9%) and Others(n=13,11.3%). Ninety-five hemispheres presented with ipsilateral strokes(44.6%), and 65 with ipsilateral TIAs(30.5%), Most strokes were ischemic(n=81,85.3%), 13 were hemorrhagic(6.1%) and 1 had both(0.5%). Management strategies were: conservative(n=73,34.3%), direct bypass(n=14,6.6%), indirect bypass(n=114,53.5%), both(n=11,5.2%) and burrhole(n=1,0.5%). There were more male(p<0.001) and Down's syndrome patients in group1(p=0.036); whereas there were more patients with neurofibromatosis type 1 in group2(p=0.026). No significant differences in baseline TIA or stroke occurrences were observed between the two management groups. However, more patients in group1 were symptomatic at baseline with speech disturbances(p=0.001) and weakness(p=0.067). During an average follow-up of 6.07 years, occurrence of ipsilateral TIA was similar across the two groups(p=0.987). However, group1 had fewer ipsilateral strokes(p=0.019),headaches(p=0.026), and sensory disturbances(p=0.024).

In MVA, revascularization reduced the incidence of stroke by 67%(OR=0.33,CI=[0.11,0.89],p=0.03 6) compared to conservative management at follow-up, after adjusting for other confounding variables.



Survival of Follow-up TIA/Stroke by Patient

Age Groups



Survival of Follow-up TIA/Stroke by Presenting Hypertension

Conclusions

In our cohort of mostly non-Asian patients with MMD, despite more severe symptomatic presentation, patients who underwent surgical revascularization derived symptom relief and reduced stroke recurrence by 67%. Taken together, surgical treatment should be considered for symptomatic MMD patients with an acceptable surgical risk profile.

Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Understand the race distribution of a North American Moyamoya cohort
- 2) Understand the baseline characteristics of Moyamoya presentation in this population
- Understand that surgery, with mostly indirect bypasses, is still effective in preventing the occurrence of follow-up strokes.