

expansion of arterial tissue as aneurysmatic formation without obvious neck. Its natural history is poorly known, usually patients are admitted with thromboembolic complications and/or mass effects. There have not been international collective data and correct timing for highly risky treatments has been under discussion.

To define natural history of VBADA by long-term follow-up in international VBADA population.

Methods: We collected 370 VBADAs patients from ten centers from Europe, USA, and Japan. The patients were followed until development of new ischemic or hemorrhagic stroke, brainstem or cranial nerve compression, or drop of modified Rankin scale. 183 patients were treated conservatively in first phase of treatment. The needed data for natural history calculations were available for 174 patients with cumulative follow-up of 582,8 patient-years. Multiple statistical analysis were performed to identify annual risk of disease progression.

Results: The annual mortality or morbidity was 19,8%. Majority of VBADA patients were male (109) where disease progression was most malignant. Basilar artery location was associated with severe disease progression with annual adverse event of 24,3%. VBADA maximum diameter was directly proportional to the adverse events. Age above 55,5 years predicted mortality.

Conclusions: This study verifies malignancy of VBADA and encourage invasive treatment in early phase of disease progression based on radiological characteristics, age and sex of the patients when treatment option is seen suitable.

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NOVEL DATA ON THE TOLERANCE OF CEREBELLAR VESSELS FOR TEMPORARY OCCLUSION USING AWAKE TESTING

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Vascular Pathologies I (Vascular Parallel Session v.3), September 27, 2023, 4:50 PM - 6:20 PM

Background: Currently, there is no data available regarding the temporary occlusion time tolerance of cerebellar vessels during surgery. We seek to ascertain original data on temporary occlusion of cerebellar vessels and identify factors that would decrease morbidity of procedures that require temporary clipping.

Methods: A prospective 7-year institutional board-approved study for awake surgery for complex aneurysms and vascular malformations was conducted - 202 patients; 162 (80%) patients Awake Craniotomy (AW), 40 (20%) under General Anaesthesia (GA).

In the awake cohort, 25 patients needed temporary occlusion of at least one of the 3 cerebellar main vessels as part of the microsurgical treatment (PICA: 16, AICA: 3, SCA:6).

In addition to clinical neurological awake testing, standard controlled neurophysiological testing was performed. This study paradigm is based on standard immediate removal of temporary clip if any changes in awake or electrophysiological testing is detected.

Results: Of the 16 patients who underwent temporary PICA occlusion, 7 tolerated occlusion (2-25 minutes), without any awake neurological findings. 9 developed Reversible Neurological Deficits (RND). Of the 3 patients who underwent AICA, none tolerated occlusion. All 3 developed neurological deficits (10 seconds -2 mins). Of the 6 who underwent SCA, 2 tolerated occlusion (1-18 minutes), without developing neurological deficits. 4 patients developed RND. Mean time to develop RND was 55s (10-190s). No patient developed permanent neurological deficit from temporary occlusion testing in this study.

Of the 16 patients who developed RND (in the cerebellar cohort), only 3 also had a concomitant change in motor evoked potentials. No patient developed EEG or SSEPs changes.

Conclusions: This novel data suggests that certain cerebellar vessels may tolerate lengthy occlusion without permanent neurological deficits. Vessels that do not tolerate temporary occlusion result in neurological deficits within 190 seconds. Electrophysiological testing failed to detect ischaemic changes in the

majority of the subjects.

Optional Image

Vessel	Awake Temporary Occlusion Testing	Tolerated Occlusion (range of temp occlusion time)	Developed Reversible Neurological Deficits (range of temp occlusion time)
PICA	16	7 (2-25 minutes)	9 (30 seconds-3 minutes)
AICA	3	0	3 (30 seconds-2 minutes)
SCA	6	2 (1-18 minutes)	4 (30 seconds-3 minutes)

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THE ROLE OF FLOW-AUGMENTATION BYPASS IN MOYAMOYA DISEASE AND HEMODYNAMIC ISCHEMIC STROKE

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Background: Flow-augmentation bypass surgical techniques aim to restore cerebral blood flow in hypoperfused brain territories in patients with moyamoya disease (MMD) and in patients with hemodynamic ischemic stroke. This study aims to present the results of a large retrospective clinical series of patients treated with flow-augmentation bypass for MDD and to provide a systematic review of the literature on flow-augmentation bypass for hemodynamic ischemic stroke patients.

Methods: We have retrospectively analyzed adult patients with a diagnosis of MDD who underwent a surgical procedure of direct revascularization at the Department of Neurosurgery, Huashan Hospital, Fudan University (Shanghai, China) from March to June 2020. All participants were assessed at discharge, at 30 days, 6-months, and 1-year post-surgery. Meanwhile, the systematic literature review was performed according to the PRISMA guidelines 2020. Search terms included specific keywords such as "STA-MCA bypass"; "chronic ischemic stroke"; "hemodynamic ischemic stroke" and "flow augmentation."

Results: A total of 176 adult patients underwent direct microsurgical revascularization. A slight improvement of the National Institutes of Health Stroke Scale (NIHSS) grade was observed. An occlusion in the bypass happened in 11.36% of cases. In 6.25% of the patients, an ischemic stroke was observed within three months. None of the strokes were fatal. The mean clinical and radiological follow-up was 11.9 months (11.4±5.4). The literature review included 3573 patients for analysis. The rate of perioperative complications was: stroke occurrence (20.81%), bypass occlusion (4.3%), and perioperative intracranial hemorrhage (0.9%). A rate of 7.2% of fatal stroke events was observed in the analysis.

Conclusions: Flow-augmentation techniques are key elements in restoring normal cerebral perfusion in MMD patients. Patients with hemodynamic ischemic stroke could benefit from the revascularization technique after careful selection. In fact, high-volume, extremely specialized centers have shown how STA-MCA bypass grafting can be performed with acceptable perioperative risks.

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THE QUEST FOR THE 'OPTIMAL' CLIP SELECTION AND MICROSURGICAL EDUCATION THROUGH PATIENT-SPECIFIC PHYSICAL AND AUGMENTED SIMULATIONS: A RANDOMIZED CONTROLLED STUDY

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