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Neuropsychological assessment of white matter pathology in patients with cerebrovascular diseases

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Introduction: According to WHO, stroke and ischemia rank as the third leading cause of death. Functional impairment of conduction tracts, specifically leucostriasis, is one of the pathologic features of cerebrovascular pathology. Given that white matter damage is the predictor of transition from normal physical function to complete, disableness within one year, and the impairment develops through stages. While neuropsychology has a range of methods for topical diagnosis of grey matter damage, there are no tools or experimental methodology for white matter pathology research (i.e. commissural system and intrahemispheric connections enabling inter-analyzer interaction (AI)). Due to existing demand from practical medicine and clinical neuropsychology it is essential to develop a neuropsychological method for assessment of cerebral conduction tracts' functional status. **Materials and methods:** Linnarsson's method of fluid intelligence test (FIT) was used. **Results:** The study included 100 patients with white matter pathology. The research subject is asked to compare interhemispheric connections. Set forming experiments are conducted using visual modality; the research subject is asked to compare circumstances with different diameters placed in different visual hemifields. Critical experiments are conducted using haptic modality; the subject is asked to compare spheres of the same volume placed in both hands. The amount of haptic illusions is indicative of AI degree. **Conclusion:** The method of FIT is especially relevant as an important means of researching the conduction tracts function in patients with cerebrovascular pathology.

Figure 1

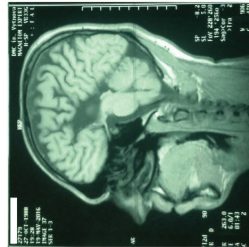
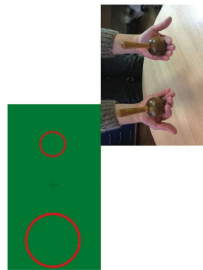


Figure 2



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Surgical treatment of epileptogenic cavernous malformations

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Background: The most frequent symptom of cavernous malformations of the brain is seizure, which is seen in 40-80% of cases. The risk of seizure onset in patients with supratentorial cavernous malformation is 1.4-2.8% per year. **Methods:** 35 patients with supratentorial cavernous malformations underwent surgery in Uzhhorod Regional Centre of Neurosurgery and Neurology between 2010 and 2016. **Results:** The mean age of patients was 32.2 years (range 17-57 years). The mean size of the lesions was 30.6 years. Localization of the lesions: frontal lobe - 14 patients (53.8%), temporal lobe - 7 patients (26.4%), parietal lobe - 2 cases (11.5%) insular and occipital lobe - 1 patient each (3.8%), 12 patients had complex partial seizures (66.2%) and in 11 cases we observed secondary-generalized seizures (62.2%). Simple partial seizures were rare (1.5%). An EEG was performed in all cases. **Conclusion:** Surgical treatment of epileptogenic cavernous malformations is safe (mortality/morbidity - 0) and effective (Engel I-IV 100%). Negative prognostic factors are long duration of the disease before surgery, secondary generalized seizures and drug resistant epilepsy.

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Surgical treatment of carotid artery stenosis

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Background and purpose: We have two surgical methods for the treatment of severe carotid stenosis, although the choice of treatment strategy using plaque diagnosis and the clinical results of CEA and CAS. **Materials and methods:** From January 2001 to December 2016, we surgically treated carotid stenosis in 291 lesions by CEA and 335 lesions by CAS. CEA was the first choice for the patients with soft atherosclerotic plaques and severe calcified plaques after plaque diagnosis was made by carotid endarterectomy. **Results:** The mean age of patients was 67.2 years (range 45-90 years). The mean size of the lesions was 2.5 cm above. **Conclusion:** In all cases after CEA or CAS, perioperative mortality with CEA and CAS was 0.3% (1/291) and 0.3% (1/335), respectively. Morbidity by ischemic stroke with CEA and CAS was 2.4% (7/291) and 2.0% (6/335), respectively. Surgical morbidity was not high in patients with medical risk factors. **Conclusions:** Carotid stenosis lesions can be treated with comparably low mortality and morbidity rates using CEA and/or CAS even with high risks, when appropriate surgical methods are selected considering each characteristic of carotid stenosis using plaque diagnosis.

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Novel indirect revascularization technique with preservation of temporal muscle function for moyamoya disease

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Introduction: Usually we perform the indirect revascularization for symptomatic Moyamoya disease in expectation of angiogenesis, but conventional method of indirect revascularization including EMS + EDAMS have some disadvantages. 1. Mass dissection of the temporal muscle. 2. Incomplete revascularization. In order to solve these problems, we devised new surgical method of indirect revascularization that use only temporal fascia but not temporal muscle. There are some important techniques in this way. **Methods:** The skin incision was performed along the STA and additional incision was performed in posterior direction to obtain temporal fascia widely. Temporal fascia and muscle were resected and EDMS were performed in intracranial way. Only temporal fascia was laid on the brain surface and used as duralplasty. The temporal muscle is reconstructed anatomically right position. **Results:** We performed this method for consecutive 18 cases (21 hemispheres) between 2012 and 2016. In all cases but one, the symptoms and CBF improved, and DSA showed the satisfactory angiogenesis. Only 1 case had wound problem. The depressed temporal region and atrophy of temporal muscle were not observed. **Conclusion:** This method is considered an excellent procedure for both angiogenesis and post-operative function. But the observation number is limited and short observation period, it will be thought that long-term examination is necessary.

Figure 1

Result	Percentage
Engel I	100%
Engel II	0%
Engel III	0%
Engel IV	0%
Engel V	0%
Engel VI	0%
Engel VII	0%
Engel VIII	0%
Engel IX	0%
Engel X	0%
Engel XI	0%
Engel XII	0%
Engel XIII	0%
Engel XIV	0%
Engel XV	0%
Engel XVI	0%
Engel XVII	0%
Engel XVIII	0%
Engel XIX	0%
Engel XX	0%
Engel XXI	0%
Engel XXII	0%
Engel XXIII	0%
Engel XXIV	0%
Engel XXV	0%
Engel XXVI	0%
Engel XXVII	0%
Engel XXVIII	0%
Engel XXIX	0%
Engel XXX	0%

P 340

A method to expand operational field in the pterional approach

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Introduction: Although the pterional route is commonly employed in craniotomies, the resulting limited field of operation is sometimes too small to facilitate removal of entire lesions, particularly supratentorial. **Objective:** To devise a method to expand the field of operation in pterional craniotomy. **Patients and Methods:** In 4 cases with lesions deemed difficult to remove totally, total excision was attempted via 4-step surgical procedure through the pterional corridor. Case 1: A ruptured arteriovenous malformation (AVM) of the anterior horn of the lateral ventricle (IC-3) in 3 years old boy. Case 2: A large meningioma involving the frontal lobe and the sphenoid ridge. Case 3: A meningioma involving the frontal lobe and the sphenoid ridge. Case 4: Craniopharyngioma within the third ventricle. **Surgical operations:** 1. Perform osteotomy of the anterior cranial base and the sphenoid ridge. If necessary, split the zygomatic arch, pull the proximal temporalis muscle into the split, and evaginate it. 2. Incise the temporal arachnoid along the free edge of the cerebellar tentorium. 3. Remove the anterior part of the zygomatic arch. 4. Perform craniotomy along the pterional corridor. 5. Perform craniotomy along the pterional corridor. **Results:** In all 4 cases, lesions were completely removed without damaging the brain. The entire series of operations was implemented for Cases 1 and 2. However, the splitting of the zygomatic arch was judged unnecessary and thus omitted for Cases 3 and 4. **Conclusion:** We devised and implemented a method for operational field expansion in the pterional approach. This method is useful for the removal of lesions, particularly giant supratentorial, that are difficult to remove using the conventional pterional approach.

Figure 1

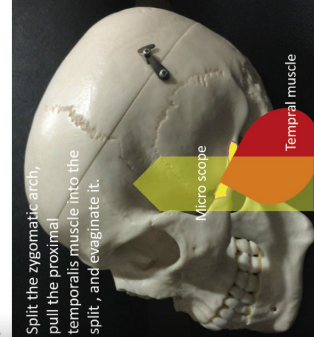
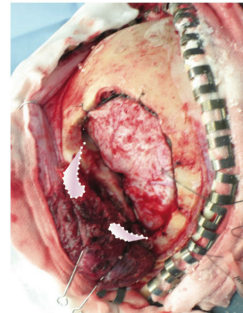


Figure 2



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Bilateral lateral carotid artery aneurysms at the subperforal portion with unilateral lower cranial nerve palsies - review and consideration of surgical strategy

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Introduction: We report an extremely rare case of spontaneous bilateral extracranial ICA aneurysms at the subperforal portion, of which the aneurysm on one side caused ipsilateral lower cranial nerve palsies. We used a unique treatment strategy including surgical and endovascular interventions. **Clinical Presentation:** A 43-year-old man had suffered left-sided lower cranial nerve palsies, MRI and CT scan showed bilateral lateral carotid artery aneurysms at the subperforal portion. Considering the therapeutic strategy, we understood that the first target is symptomatic aneurysm at the subperforal portion. Asymptomatic right-sided aneurysm to preserve completely the asymptomatic lower cranial nerves in this case. Since ligation without high-flow bypass may result in increasing wall shear stress of the left-sided aneurysm, ICA ligation with high-flow EC-IC bypass was first performed for the right-sided aneurysm. Sixteen days after the right side surgery, the left-sided lower cranial nerve palsies that lasted for 2 months are now guaranteed to be resolved. **Discussion:** Some treatment options for symptomatic bilateral ICA aneurysms existed. However, there are some issues including the side to be treated first and the best treatment approach. Generally, we precede the treatment for the symptomatic side, but left-sided cranial nerve palsies that lasted for 2 months are now guaranteed to be resolved. Thus, we precede the treatment for the asymptomatic side aneurysm. ICA ligation with high-flow EC-IC bypass was performed. It was the best radical treatment to prevent right-sided aneurysm to become symptomatic and avoid considerable changes in the wall shear stress of the left-sided aneurysm. Changing the wall shear stress may promote aneurysm growth. Unilateral EC-IC bypass was also reported for bilateral ICA aneurysms. After high-flow EC-IC bypass, the asymptomatic side aneurysm became enlarged after the first treatment. We confirmed that our surgical strategy is a good choice. We prioritized aneurysm treatment on the unaffected side and obtained a good result. This treatment strategy is recommended as treatment of choice. **Conclusion:** The treatment strategy for symptomatic bilateral extracranial ICA aneurysms at the subperforal portion is still unknown, we recommend the aneurysm on the "asymptomatic" side. This strategy may be one of the best treatment approaches for this condition.