“Epileptic seizure” as the first sign of basilar artery occlusion

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Background: Acute basilar artery occlusion (BAO) represents a neurological emergency, and when suspected prompt neuroimaging and early initiation of reperfusion therapy can lead to the good clinical outcome. Initial presentation can range from mild prodromal symptoms preceding BAO for days or even months, fluctuating progressive symptoms, to abruptly developed devastating neurological deficit. The variety of clinical pictures in BAO is the consequence of the localization and duration of occlusion, mechanism of occlusion and the extent of collateral circulation.

The diagnosis is often challenging due to heterogeneity of presenting clinical symptoms, including decreased level of consciousness, visual disturbances, cranial nerve abnormalities, pseudobulbar syndrome, vertigo, severe hemiparesis, tetraparesis or involuntary, “seizure-like” limb movements. Success of BAO management is time dependent and sometimes “convulsive-like” movements may be the only early diagnostic clues.

Methods: We present clinical findings, emergency diagnostic and therapeutic procedures in several patients with BAO whose initial presentation included involuntary movements mimicking “epileptic seizure”. On admission, in all patients, initial medical history taking and clinical examination were performed by a neurologist. All patients underwent emergency lab testing, ECG, non enhanced CT followed by CT angiography to confirm the BAO. The fourth patient, initially unrecognized as BAO, was transferred to our NICU from a local hospital second day of the disease and brain MR, MR angiography and digital angiography were urgently performed. All patients received reperfusion therapy (i.v. rtPA followed by mechanical thrombectomy (MT) or mechanical thrombectomy alone), depending on the time of symptoms onset.

Case 1) 62y male, history of operated rectal carcinoma and ongoing chemobiotherapy, initially suddenly developing involuntary movements described as spasms and shaking of the right limbs, then of the left limbs. Urgently transported from home to emergency department (ED). Neurological examination 20 minutes later showed decreased level of consciousness (GCS 12), dysarthria, left hemiplegia, hemihypesthesia, ipsilateral Babinski sign and involuntary rhythmic clonic movements in right limbs mimicking partial motor seizure activity. Neurological status at discharge- mRS 1 (picture 1)

Picture 1a) 8.40 h CTA intracranial occlusion of the distal third of BA –8h48 min. started i.v. thrombolysis 1b) DSA 1c) DSA after MT 1d) MRI after MT

Case 2. 67y female, arterial hypertension. Sudden onset of confusion with intermittent tonic involuntary movements of left limbs. During the transport to ED she received 10 mg diazepam i.v., without no clinical recovery. During workup in the ED deterioration to GCS 10 with rhythmic, symmetrical extensor posturing and tonic movement of all four extremities followed by periods of normal tone, with bilateral Babinski sign. (picture 2)

Picture 2a: CTA, 2b) DSA, 2c) DSA after MT, 2d) MRI at discharge

3a) Initial CT - hyperdense BA sign. 3b) DSA, dissection of VA dex +BAO 3c) DSA after MT, (TICI IIb) 3d) MRI - Extensive zones of acute ischemia

Case 3) 72y female, AF (NOAK), arterial hypertension. Sudden onset of involuntary tonic movements of right extremities for several minutes, which were generalized to tonic-clonic movements of all four extremities at the arrival to the ED. Rapid lowering of consciousness to coma. GCS 8. Lethal outcome. (picture 3)

Picture 4a : Brain MRI ischemia of pontine region with edema 4b) DSA 4c) DSA after MT

Case 4. 25y female, oral contraceptive therapy, no medical history. Wake up onset of instability, nausea, vomiting, febrile. Admitted to the Dpt of Neurology of a county hospital due to rapid development of dystonic movements of all 4 extremities with intermittent myoclonus, CSF 15/3 cells; brain CT - described as normal. Diagnosed as encephalitis, virostatic therapy initiated. Within 24h rapid clinical deterioration – tetraparesis, coma, respiratory failure. Urgently transported to our NICU. After brain MRI and MRA confirmed BAO, we performed DSA and mechanical thrombectomy with recanalization of BA (>36h since the onset of the symptoms). Neurological status at discharge – “locked in”.

Results: We presented several of our patients with BAO presenting with “seizure mimic”; involuntary seizure like movements as the first sign of stroke development. Awareness of such a possibility where “seizure-like” movements are initially the only diagnostic direction in the diagnosis of BAO, directed us to a quick diagnostic neurovascular imaging procedure to confirm the diagnosis. Clinical outcome in our patients was not only a consequence of achieved recanalisation but was also a consequence of the time of the symptoms onset and the initiation of the reperfusion treatment.

Discussion: Seizure as initial presentation of stroke is rare, according to some studies it is present in only 2% cases of stroke. Seizures are more common with anterior circulation stroke and rare in BAO and posterior circulation stroke. They may be a consequence of the ischemia of descending pathways.

The clinical improvement and outcome of acute BAO is directly related to the clinical symptoms, location of the occlusion, time from symptoms onset to reperfusion treatment and degree of achieved recanalisation. “Seizure like” symptoms at the onset of BAO are sometimes difficult to distinguish from true epileptic seizures. But in emergencies, estimated by experienced neurologists they may help to direct the suspicion to BAO and enables a quick diagnostic and therapeutic procedures.

Conclusion: BAO is a state of emergency with a “hundreds of clinical faces”. In our paper we highlighted the needs for awareness of such a possibility, where “seizure-like” movements are initially the only diagnostic direction in the diagnosis of BAO. Importance of early recognition estimated by experienced neurologists, confirmation with prompt neurovascular imaging and initiation of early recanalization/reperfusion therapy significantly contributes to a more favorable clinical outcome in this devastating form of stroke.

Key words: basilar artery occlusion, seizure