NEUROPHYSIOLOGICAL NEUROMONITORING DURING ARTERIOVENOUS MALFORMATION EMBOLIZATION

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BACKGROUND
Intraoperative evoked potential (EP) monitoring has become a routine part of operative neurosurgical and neuroradiological procedures. Purpose of our study is to evaluate the efficacy of neurophysiological monitoring (NPM) techniques with the aid of selective intra-arterial administration of thiopental to detect functional cerebral area vessels feeding and to prevent ischemic complications during endovascular treatment of cerebral vascular malformations.

CASE REPORT
A 49 years-old woman complained of headache and left upper limb paresthesia for 4 years. A cerebral MRI with angiogram study revealed an arteriovenous malformation (AVM) with the nidus located in the sensitive post-rolandic area and the venous drainage collecting in a large cortical vein surrounding the motor area. Under general anesthesia, patient underwent to the endovascular treatment of the AVM by coil embolization. The endovascular procedure was accomplished with the aid of NPM including electroencephalography, somatosensory evoked potentials (SSEPs) and motor evoked potentials (MEPs). After superselective catheterization of a parietal artery feeding the nidus, intrarterial administration of tiophental was performed to assess its vascular territory and the reliability of its coil embolization; a SSEP line drop was recorded without concurrent MEP changes. This SSEP fall proved the importance of the vessel that was to be spared (FIGURE 1). Onix® embolization was performed in feeding vessels where no evoked potential fall was recorded (FIGURE 2). The patient had a slow recovery from anesthesia; once recovered, patient complained of mild left hand paresthesia improved in 24h. The control cerebral MRI ruled out hemorrhagic or ischemic complications. She was discharged without neurological deficits.

CONCLUSION
Both in elective and emergency endovascular treatment of cerebral vascular malformations, neurophysiological monitoring with the aid of anesthetic techniques can prevent ischemic complications. Recording the neurophysiological response, administration of thiopental in selective feeding vessels of the AVM helps to identify the arteries significant to functional cerebral areas. As the eloquent area feeding arteries are identified, the neuroradiologist knows which vessels can be closed avoiding motor or sensitive deficits and improving patient outcome.

REFERENCES