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The role of the surgical technique in incidence of postoperative epileptic seizures in unruptured intracranial aneurysm clipping

Dear Editor,

We read with great interest the article entitled “Factors associated with early seizures after surgery of unruptured intracranial aneurysms” by Fushihara et al. published last February.

These authors re-proposed the interesting topic of the risk of epileptic seizures after clipping of unruptured cerebral aneurysms.

As Fushihara et al. clearly underlined, this issue has already been largely discussed in the past by several authors who have progressively advised to abandon the anti-epileptic prophylaxis, due to the overall low risk of epilepsy during this subarachnoid procedures [1].

However, although the global incidence has decreased over the decades, mainly thanks to the surgical and anesthesiologic improvements, recent series published in the new millennium still report incidences of post-operative seizures that reach, and sometimes exceed, 15% of cases. These percentages are not so reassuring to support the decision to not consider anti-epileptic prophylaxis under any circumstances.

The authors have to be commended for their effort to elucidate the risk factors associated with the incidence of seizures in their series. They identified dialysis in patients with chronic renal failure and occurrence of iatrogenic brain damage, such as post-operative infarction, hemorrhage, contusions, as the main factors.

However, they did not discussed the details regarding this iatrogenic brain damage. In fact, if on one hand the necessity of dialysis is a not modifiable risk factor, iatrogenic brain injuries are basically related to the surgeons' experience and to their technical skills.

The necessity of a specific expertise and of a refined surgical technique is of paramount importance for unruptured aneurysms clipping, in which patients are usually completely asymptomatic before the intervention, and expect to have an uncompromised functional result after surgery, and a totally preserved quality of life. This is the only patients-oriented outcome one may desires when is undergone surgery for an unruptured aneurysm.

In our recent experience of the last 10 years, we noticed that the improvement of the expertise due to the formation of an ultra-specialized neurovascular team along with a progressive technical refinement characterized by a miniaturization in the approaches, the complete abolition of the brain retractors, and the tailored open of the cisternal spaces, in particular of the sylvian fissure for the treatment of the middle cerebral artery aneurysms, have led to a substantial reduction in the incidence of epileptic seizures.

In particular, we have started systematically using the minipterional approach associated with a limited opening of the sylvian fissure (from 1 to 2 cm) since the end of 2013 for treatment of unruptured MCA aneurysms (except for those very large or complex) [2]. Similarly, we systematically have adopted a lateral supraorbital approach for treatment of almost all unruptured ICA and ACoA aneurysms since 2014 [3].

We also constantly embraced special measures to avoid violating the cortical surface during cerebral manipulation. Among these, the most important are the application of large sheets of humid gelfoam on the brain cortex, and the use of latex glove cut-outs to allow the cottonoids to slide over them avoiding their abrasive effect [4].

Overall, Recently, we retrospective reviewed our series of clipping of unruptured aneurysms of the anterior circulation of the past 12 years, and we appreciated a reduction of the seizures incidence of seizures from more than 3% to < 1% of the years 2010–2013 to < 1% by comparing the cases operated on before and after since 2014, when we systematically adopted minimally invasive approaches. During the last 5 years, in fact, we recorded only one case of seizure in a patient operated on for an AComA aneurysm among about 187 clipping, while from 2008 to 2013 we observed 6 cases among 183 patients. However, this difference did not appear statistically significant, but only showed a trend. almost 0% in the last 5 years in about 250 cases of unruptured aneurysms of the anterior circulation.

Of course, we cannot exclude that other factors such as the reduction of surgical duration and the improvement in anesthesiologic techniques, along with the systematic use of the intraoperative neurophysiological monitoring, which guided a neuroprotective anesthetic plan, may had played a preventive role. Nevertheless, during this period, we have certainly documented that our continuous improvement as cerebrovascular surgeons has globally reduced the incidence of iatrogenic damage, which is, as the authors have shown in this paper, strictly related to the incidence of post-operative seizures.

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