

Three to four percent of stroke cases are caused by subarachnoidal bleeding due to aneurysm rupture. Unruptured intracranial aneurysms (UIA) are: asymptomatic incidental aneurysms, symptomatic aneurysms, and multiple aneurysm cases in SAH patients. The rupture incidence of unruptured aneurysms in the general adult population should be at least 1% per year. Recently, well-designed prospective clinical studies, metaanalyses and guidelines have been published dealing with diagnosis and therapy of UIAs (1-6).

The prevalence of unruptured intracranial aneurysm is different from population to population, more frequent findings among elderly, females and polycystic kidney patients. Unruptured familial intracranial aneurysm patients represent ca. 8-10% of cases. Because only a minority of UIA patients will present with SAH it would be important to identify those UIA patients who live in high risk for rupture. Hypertension, smoking, certain locations, growth, special morphology of UIA are associated with high risk for rupture. But it is unclear if the change of modifiable risk factors influences the outcome of previously asymptomatic UIAs. Patients with family history of aneurysm, cranial nerve symptoms or with a prior SAH live in higher risk and need individual consideration and close follow up. Patients with polycystic kidney disease and persons with a family history of aneurysms or SAH may benefit from screening but the cost-effectiveness of screening in other groups is unclear. Patients with  $\geq 2$  family members with IA or SAH should be offered aneurysmal screening by CTA or MRA. TOF MRA is preferred to CTA for repeated long-term follow-up.

With increasing size over 7 mm, the risk of SAH increases. The internal carotid and basilar artery aneurysms were more likely to grow than in other regions. Cavernous carotid aneurysms have the lowest, anterior circulation aneurysms have intermediate rates of rupture while posterior circulation aneurysms have the highest rates of rupture. The ICA and basilar artery aneurysms were more likely to grow than in other regions. Unfortunately, both the interval between imaging studies and the mode of that remain unclear. Although DSA is the optimal method for decision on repair, but follow-up imaging should be performed by either CTA or MRA.

The physician should consider patient age, location and size, comorbidities and the long term outcomes of his/her center. The microsurgical intervention is associated with higher morbidity, than endovascular repair therefore in elderly patients the benefit of coiling seems to be greater. The microsurgery could be preferred in the treatment of the majority of MCA aneurysms and the endovascular intervention in the treatment of most basilar apex and vertebrobasilar confluence aneurysms. The flow-diverting stents, and stent-assisted coiling procedures might be new treatment strategies in the future and can be also considered in carefully selected cases, but the long-term outcome is not yet determined. After microsurgery or endovascular intervention, repeated imaging and assessment of cognitive outcome is warranted. The assessment of the degree of aneurysm obliteration after surgical or endovascular intervention is also necessary to determine the frequency of follow-up. Long-term follow-up is particularly important for those aneurysms that are incompletely obliterated.

### **Summary**

- Numerous factors should be considered for determining the optimal outcome of a UIA (growth, size, location, morphology, age, prior SAH, family history, multiplicity): all these factors may predispose to a higher risk of rupture.
- Although the surgery may be associated with longer lasting protection against aneurysm regrowth, but the endovascular intervention could be superior to surgery in other aspects (lower morbidity and mortality, shorter length of stay,

costs), so it may be reasonable to choose this therapy in basilar apex UIA and in old patients.

- Endovascular coiling is associated with a reduction in procedural morbidity and mortality over surgical clipping in selected cases but has an overall higher risk of recurrence.
- If many risk factors exist in a patient with small asymptomatic UIA and low hemorrhage risk, observation is a reasonable alternative.
- Although the ESO guideline summarizes only general recommendation on the therapy of UIA, both guidelines (ESO and AHA/ASA) agree that individual decision is necessary before any therapeutic step.

**Should asymptomatic intracranial aneurysm always be treated? No.**

## **References**

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