Editorial

Management of the Unruptured Intracranial Aneurysm (UIA)

Katsumi Matsumoto*

Department of Neurosurgery, Iseikai Hospital, Japan

EDITORIAL

Despite improvement of the treatment of ruptured cerebral aneurysms including advancement of clipping surgery, coil embolization, intensive care in stroke care unit, overall results of the subarachnoid hemorrhage (SAH) still unchanged during recent quarter-half centuries [1]. Due to recent advancement of MRA or 3D-CTA, incidence of detection of the unruptured intracranial aneurysm (UIA) is increasing to 3-5% [2,3] among healthy asymptomatic adults. Prophylactic treatment of UIA has become a major focus in improving overall mortality and morbidity of SAH. However, the question arises whether surgical treatment of UIA improve overall results of SAH, because complication either with clipping surgery or with coil embolization is high whereas natural history of UIA is relatively benign [4]. The problems underlining natural history and surgical complication are discussed.

Natural history of UIA

The first international study of UIA (ISUIA) showed extremely low rupture rate of 0.05% per year less than 10 mm without a history of SAH [5]. Before, rupture rate of observed UIA was reported to be 1-2%/year [6]. After the results of ISUIA, however, lots of counterarguments were done. Jubela et al. reported that the incidence of rupture in UIAs was for 1.3% per year [7]. Morita et al. reviewed Japanese data in which annual rupture rate was 2.7% [8]. Our report showed 1.8% per year [9]. The incidence of SAH is high in Japan and Finland attaining to 20 per 100,000 person-years [10,11], whereas other country 4-9 per 100,000 person-years [1]. The very low rupture rate may reflect different incidence of subarachnoid hemorrhage among different countries. The major problem in ISUIA is that only one ruptured patient determined the incidence for 0.05%. At least 10 or more ruptured cases are necessary for such determination, much more patient’s base being added in future. The patients are relatively restricted to North America areas. The study also should include Asia and Scandinavia patients and subgroup analysis should be done, otherwise the results of ISUIA reflect only local results in the world.

The results of ISUIA showed that aneurysm size is a major risk factor for rupture in which other reports completely agree [4,5,7-9]. Why the ISUIA lined below 10mm and above 10mm and concluded that the former is benign?

The mean size of the ruptured cerebral aneurysms is 7mm [12]. Recently Güresir E reported that rupture rate of UIA less than 7mm is 0.2% per year [13].

At least careful observation is necessary even for small UIA. On the other hands, rupture risk for UIA increase with size. In the ISUIA study, supratentorial UIA around 13-24mm in size rupture by 3%/year, and UIA over 25mm rupture by 8%/year [4-5].

Surgical risk for prophylactic treatment

Despite improvement of clipping surgery including intraoperative SEP/MEP monitoring or intraoperative ICG angiography, or the selection of coil embolization, complication of the surgical treatment is still high, accounting for 4-7% morbidity by coil embolization [14,15], 5-17.5% morbidity by clipping surgery [4,15]. Based on the surgical results, it is hard to decide surgical indication for the small UIA with inherent natural history around 1%/year.

Serial radiological follow up for small UIA

Whole discovered UIA change in size or when rupture are not well documented. The reports of serial MRA follow up study indicated that growth rate was around 2-4.5% /year [7,9,16], which is over twice as high as annual rupture rate [7,9,16]. The rupture rate for growing UIA is 10 times higher than that of stable UIA [17]. These results indicate that small aneurysm should be at first observed, but should be surgically treated when size or shape changed by serial radiological follow up. In my data, about one thirds of UIA rupture or change in size within 1 year. Careful observation is necessary within one year [9].

SUMMARY

UIA should be considered for surgical treatment when aneurysm size is large (over 13mm). In small UIA, careful observation by MRA is recommended. When aneurysm enlarged, surgical treatment should be considered along with patient’s age, other risk factors including previous history of SAH, hypertension, female multiple aneurysms. Smoking should be of course completely prohibited.

REFERENCES


