Aneurysm Residual Regrowth, Recurrence and De Novo Aneurysm Formation after Microsurgical Clip Occlusion

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Introduction

Established guidelines for radiologic surveillance after microsurgical treatment of intracranial aneurysms are lacking in the literature due to small sample size, missing definitions and heterogeneous use of imaging modalities. We aimed to propose a clinically meaningful definition for postoperative aneurysm residual, recurrence and de novo aneurysm formation by validating our long-term follow-up (LFU) catheter angiography results in patients with microsurgically treated intracranial aneurysms.

Methods

From our prospective database we performed a retrospective review of all aneurysms treated microsurgically by the senior author from 1997 to present to identify patients with LFU catheter angiography (>1 year after surgery). Clinical and radiological data were collected for analysis.

Results

We identified 240 patients harboring 380 aneurysms (mean FU 6.0 ? 3.3 years per patient, range 1.0–16.8 years). Postoperative residuals were present in 16 aneurysms (4.6%), of which 13 (81.3%) were intentionally left. Two out of 16 residual aneurysms (12.5%) demonstrated regrowth, with a regrowth risk of 2.1% per year from 93.6 patient-years of angiographic FU. Of 326 aneurysms with no postoperative residual, 5 (1.5%) demonstrated aneurysm recurrence, with a recurrence risk of 0.26% per year from 1931.9 patient-years of angiographic FU. Eight de novo aneurysms were identified in 240 patients (3.3%) with a risk of 0.6% per year from 1441.9 patient-years of angiographic FU.

Conclusions

In experienced hands microsurgically treated aneurysms have a very low risk of postoperative residuals and aneurysm recurrence. Growth of residuals and de novo aneurysm formation justify the FU with catheter angiography 3-5 years after microsurgical clipping.

Learning Objectives

1)We propose in this study a clinically meaningful definition for postoperative aneurysm residual, recurrence and de novo aneurysm formation by validating our long-term follow-up (LFU) catheter angiography results in patients with microsurgically treated intracranial aneurysms.

2)In experienced hands microsurgically treated aneurysm have a very low risk of postoperative residuals (4.6% including intentionally left residuals; <1% unintentionally) and aneurysm recurrence (1.5%).

3)Growth of residuals (2/16; 12.5%) and de novo aneurysm formation (3.3%) justify the FU with catheter angiography 3-5 years after microsurgical clipping.