Background and Purpose—This prospective study investigated whether surgery for unruptured intracranial aneurysms (UIAs) affects cognitive function and cerebral blood flow (CBF).

Methods—Cognitive tests using the Wechsler Adult Intelligence Scale-Revised, Wechsler Memory Scale, Rey–Osterrieth Complex Figure test, and CBF measurements using single-photon emission computed tomography were performed before and after surgery for UIAs in 44 patients ≤70 years of age.

Results—Group-rate analysis showed the verbal intelligence quotient (IQ), performance IQ, full-scale IQ, and recall trial scores of the Rey–Osterrieth Complex Figure test all increased significantly after surgery, whereas the Wechsler Memory Scale and copy trial scores of the Rey–Osterrieth Complex Figure test were not significantly different. Event-rate analysis demonstrated that no patient showed impaired cognition. There was no significant difference between CBF before and after surgery.

Conclusions—Surgical repair for UIAs does not impair cognition or CBF in patients without postoperative restrictions in lifestyle. (Stroke. 2005;36:000-000.)

Key Words: cognition ■ intracranial aneurysm ■ surgery
TABLE 1. Group-Rate Analysis of Cognitive Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Preoperative Mean (SD)</th>
<th>Postoperative Mean (SD)</th>
<th>Paired t Test P</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAIS-R (verbal IQ)</td>
<td>88.5 (12.2)</td>
<td>90.9 (13.1)</td>
<td>0.0038</td>
</tr>
<tr>
<td>WAIS-R (performance IQ)</td>
<td>95.1 (10.8)</td>
<td>100.2 (13.0)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>WAIS-R (full-scale IQ)</td>
<td>91.2 (11.4)</td>
<td>94.9 (13.4)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>WMS</td>
<td>102.1 (16.4)</td>
<td>105.1 (17.5)</td>
<td>0.0611</td>
</tr>
<tr>
<td>ROCF (copy)</td>
<td>35.1 (1.4)</td>
<td>34.7 (2.4)</td>
<td>0.232</td>
</tr>
<tr>
<td>ROCF (recall)</td>
<td>17.4 (7.8)</td>
<td>19.9 (7.9)</td>
<td>0.0110</td>
</tr>
</tbody>
</table>

postoperative cognitive impairment. The change in CBF in before and after surgery was analyzed using the paired t test. Statistical significance was set at the $P<0.05$ level.

Results

Surgical complications occurred in 2 patients (parent artery occlusion and brain contusion), resulting in modified Rankin Scale scores of 2 and 5. Forty-four patients were entered in this study during the study period: 17 men and 27 women aged 32 to 70 years (mean age 56.8 years). The UIAs were found incidentally in 30 patients, and the remaining cases were found by other reasons (manifested as visual impairment in 2 patients and cerebral stroke in 12 patients). The mean interval between the onset of stroke and surgery for UIAs was 232±56 days.

Group-rate analysis of the neuropsychological tests is summarized in Table 1. The verbal intelligence quotient (IQ), performance IQ, full-scale IQ, and recall trial scores of the ROCF increased significantly after surgery. The WMS and copy trial scores of the ROCF showed no statistical difference before and after surgery. Event-rate analysis showed no patient developed postoperative cognitive impairment. There was no significant difference between CBF before and after surgery (Table 2).

Discussion

The present study demonstrated that surgical treatment of UIAs does not impair cognitive function or CBF in patients without postoperative restrictions in lifestyle.

Previous studies of cognition after surgery for UIAs have involved various study designs. The ISUIA lacks data of cognitive change before and after surgery.2 Another study defined impaired cognition as a decrease in postoperative test scores by ≥1 points, which may overestimate postoperative cognitive impairment compared with our study.3 Other previous cognitive study confirmed safe surgery for UIAs, although no CBF study was done.6 Our results confirmed that neither cognitive function nor CBF decreased after surgery. Previous research showed that surgical repair of UIAs does not affect CBF if the surgery can be completed with fine surgical manipulation.10 Thus, we believe that fine surgical manipulation preserves cognitive function.

Group-rate analysis found that the scores of the WAIS-R and ROCF improved after surgery. Improvement with practice can occur if patients are reassessed within 3 months.11 Other potential causes of the improved cognitive scores after surgery include a different cognitive test battery than those used in previous studies, the high preoperative level of anxiety affecting cognitive function,12 the inclusion of patients recovering from stroke, and the neuropsychologist being unaware of the clinical information. In conclusion, the present study demonstrated that surgical repair for UIAs does not impair cognitive function in patients without postoperative restrictions in lifestyle.

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References


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