A 37 year old woman was admitted to the department of neurosurgery because of severe headache during sexual intercourse 4 weeks earlier. Cerebral MRI showed an aneurysm of the left middle cerebral artery which had caused a subarachnoid haemorrhage.

Transcranial 2 MHz duplex sonography (Logiq 500, General Electrics) disclosed an aneurysm at the ramification of the middle cerebral artery into the M2 branches (fig 1 B1 and C1)—the signal being a constant feature irrespective of insonation angle and turbulent blood flow in this region. The flow velocity in all other cerebral arteries was slightly increased.

Hypoplasia of the left A1 branch of the anterior cerebral artery (fig 1 C, 2) was found. The A2 branch of the left anterior cerebral artery was supplied by the right A1 branch (fig 1 C, 3).

Digital subtraction angiography confirmed the site of the aneurysm (fig 1 D, 1) and the hypoplasia in the left A1 branch (fig 1 D, 2).

Vasospasm in all cerebral arteries (mean blood flow velocity=249 cm/s) was found 3 days after clipping of the aneurysm. The local flow velocities around the clip were markedly increased 5 days postoperatively, whereas those in the other cerebral arteries were only slightly increased. Dynamic three dimensional images showed a totally clipped aneurysm (fig 1 E, 1).
Figure 1(A) Normal Circle of Willis. 1=Internal carotid artery; 2=middle cerebral artery; 3=anterior cerebral artery A1; 4=anterior cerebral artery A2; 5=posterior cerebral artery; 6=posterior communicating artery; 7=superior cerebellar artery; 8=internal carotid artery; 9=middle cerebral artery; 10=anterior cerebral artery 1A; 11=anterior cerebral artery A2; 12=posterior cerebral artery; 13=posterior communicating artery; 14=superior cerebellar artery; 15=basilar artery. For B, C, D, and E see text.
Preoperative and postoperative imaging of an aneurysm of the middle cerebral artery with transcranial duplex sonography

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