Further Experience with Surgical Treatment of Aneurysms of the Basilar Artery*

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It seems clear that, in regard to surgical treatment, aneurysms of the basilar artery should be considered in two groups, those along the trunk of the vessel and those at the bifurcation. As a result of previous experience in 14 cases, it was stated that: 1) most saccular aneurysms along the trunk of the vessel could be approached and obliterated by clip or ligature with reasonable safety, and 2) aneurysms at the bifurcation were particularly dangerous because of the hazard of injury to the leash of vital perforating vessels intimately applied to the sac posteriorly and irrigating the midbrain and diencephalon. These conclusions can be modified in view of further experience with 17 cases in which there were no operative deaths, while significant morbidity occurred only in two patients although ultimately it caused the death of one.

The subtemporal approach previously described appears to give the most direct access to these aneurysms whether they lie above or below the tentorium. We have not used hypothermia since 1962. Moderate (systolic pressure 70–80 mm Hg) or, preferably, deep or profound hypotension (systolic pressure 40–50 mm Hg) is used routinely at normal body temperature as the major surgical adjunct. The pressure is measured through a cannula placed in the radial or femoral arteries. The reduction of pressure is induced with Arfonad and occasionally deepening of anaesthesia and change of posture. That perfusion of the brain and vital organs is adequate is evidenced by the fact that pressures of 45 mm Hg seem to be tolerated for 1 hour or more without demonstrable effect, even in patients over 60. The chief asset with this degree of hypotension is that the aneurysm is soft and can be dissected free and handled with little fear of rupture. Local brain anemia from retraction and infarction from low flow are potential hazards which have not yet been encountered.

Magnification using 2½ power Loupes is now an indispensable part of the technique. The investments and connections of the aneurysm and the small arterial twigs are clearly seen. The tiny white tissue planes show up so that an adherent aneurysm can be dissected with a knife from dense arachnoid, the basal dura or its parent artery.

Aneurysms of the Trunk of the Basilar Artery

Of the five cases in this category, the aneurysm arose at the origin of the superior cerebellar artery in one, at the anterior inferior cerebellar artery or vertebral artery junction in two, a persistent hypoglossal artery in one, and as a fusiform glossal aneurysm in one (Fig. 1). Another patient had a basilar-superior cerebellar aneurysm but it was small, unruptured, and explored incidentally to clipping a ruptured basilar bifurcation aneurysm (Case 25). The cases, numbered as additions to the original series are summarized in Tables 1 and 2.

Case 15. This 56-year-old woman, a known hypertensive, was well at the time of operation 9 days after a second bleeding. The interpeduncular cistern was filled with a dense meshwork of adhesive arachnoiditis and had to be opened with sharp dissection beneath the third nerve to expose the neck of the aneurysm. Deeper levels of hypotension were used only briefly during the final exposure and application of a Mayfield clip. It was not necessary to divide the tentorium. The postoperative course was uneventful and a third nerve palsy, which did not become complete for 24 hours, cleared completely within 3 months.

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Case 16.* This girl of 14 had had a right sixth nerve palsy since childhood. She had two aneurysms, one on the carotid in the
canal and cavernous sinus, and the other, a fusiform dilatation of the midportion of the basilar trunk (Fig. 2 left). She was operated
on under moderate hypothermia 8 days after a second bleeding. The unexpectedly large

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