# Management of Posterior Cerebral Circulation Aneurysms

Essay
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Degree in General Surgery

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا

إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ العَلِيمُ

الحَكِيمُ

صدق الله العظيم

سورة البقرة أية (32)

# *AIM OF THE WORK*

Aim of the work is to review the literature for management of posterior cerebral circulation aneurysms.

# *INTRODUCTION*

The portion of brain lying in posterior cranial fossa, is supplied by arteries arising from the vertebrobasilar system, which contributes for arterial supply of nearly posterior one third of the brain, hence it is termed posterior circulation .Aneurysms arising from posterior circulation are relatively uncommon amounting less than 15% of all aneurysms of the brain, giving few surgeons the opportunity to gain the necessary experience and confidence in exploring the confined space in front of cerebellum**.**

***(Becker KJ,et al:in1998).***

At one time , aneurysms of vertebrobasilar system were thought to be more benign than those of carotid system and its branches,however there is increasing evidence that they are equally dangerous.Inspite of intimate relation to cranial nerves (III . VI and XII) and brain stem,most small vertibrobasilar aneurysms remain cryptic until their rupture with pathophysiological sequalae (immediate and delyed) like (.S.A.H) which is manifested by sudden onset of headache,neck pain, nausea and vomiting**.**

***(Biousse V,Newman NJ, et al:in 2003).***

The common classical investigations for early detection and management of posterior circulation aneurysms to prevent their catastrophic outcome ,are lumbar puncture, computed tomograohy,4 vessel angiography and digital subtraction angiography.Advances in neuroimaging techniques have altered the diagnosis of cerebral aneurysms dramatically.

Noninvasive angiographic methods, such as computed tomographic angiography (C.T.A) and magnetic resonance angiography (M.R.A), allow for detection and characterization of aneurysms, further enhanced by postprocessing techniques that enable 3-dimensional evaluation of aneurysm morphology.

***(Yonekawa Y,Kaku Y,et al:in 2003).***

Endovascular treatment of ruptured intracranial aneurysms avoids the morbidity and mortality related to craniotomy and surgical clipping of aneurysms. It has certainly proved effective in preventing early rebleeding and there is evidence of some long term protection of the aneurysms.

During the past decade, endovascular methods have been developed to treat intracranial aneurysms. Initially, endovascular balloon occlusion of a feeding artery was performed. However, this procedure was soon followed by direct obliteration of the aneurysmal lumen, first by detachable balloons and later by microcoils. Guglielmi and colleagues described a detachable platinum microcoil for use in treatment of intracranial aneurysms.

***(Firat MM,Cekirg S,Saatci L,et al :in 2002).***

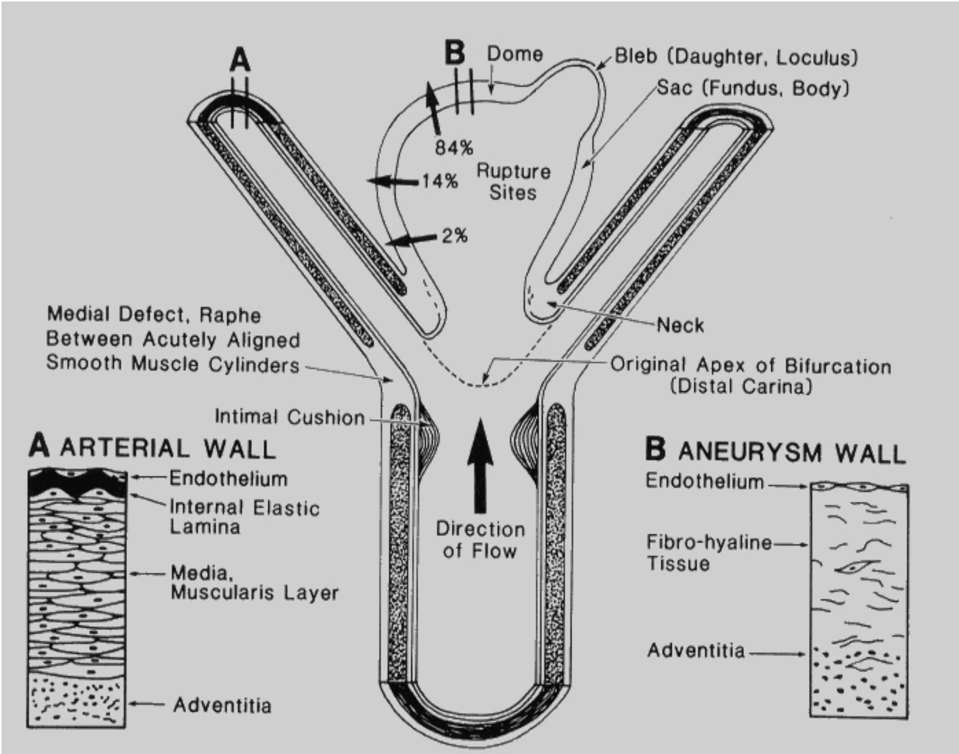
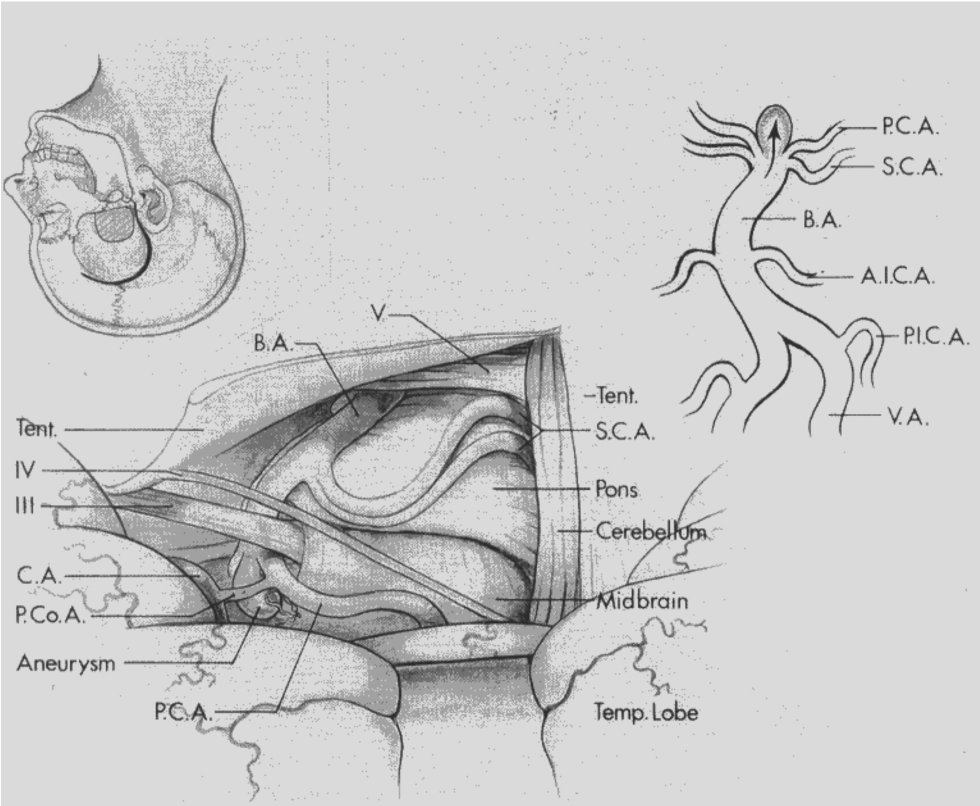
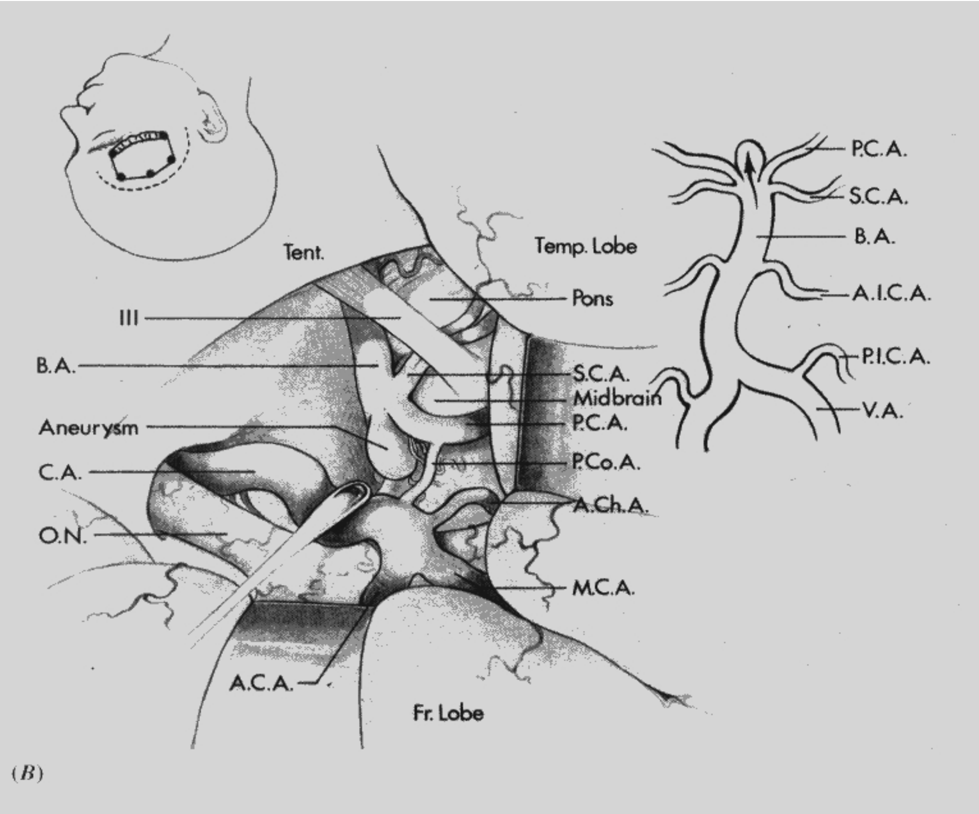



Diagram of aneurysmal pathology.
*(After Wilkin,2000).*




Common aneurysm sites in the posterior cranial fossa.
cerebellar (P.I.C.A.), and anterior inferior cerebellar (A.I.C.A.) arteries;
The site of the aneurysm and the direction of hemodynamic force (Diagrams on the upper right show the basilar (B.A), vertebral (V.A.), posterior cerebral (P.C.A.), superior cerebellar (S.C.A.), posterior inferior
arrow) at the aneurysm site.
Diagrams on the upper left show the scalp incision and bone flap craniectomy used to expose the aneurysm.

*(After Wilkin,2000).*

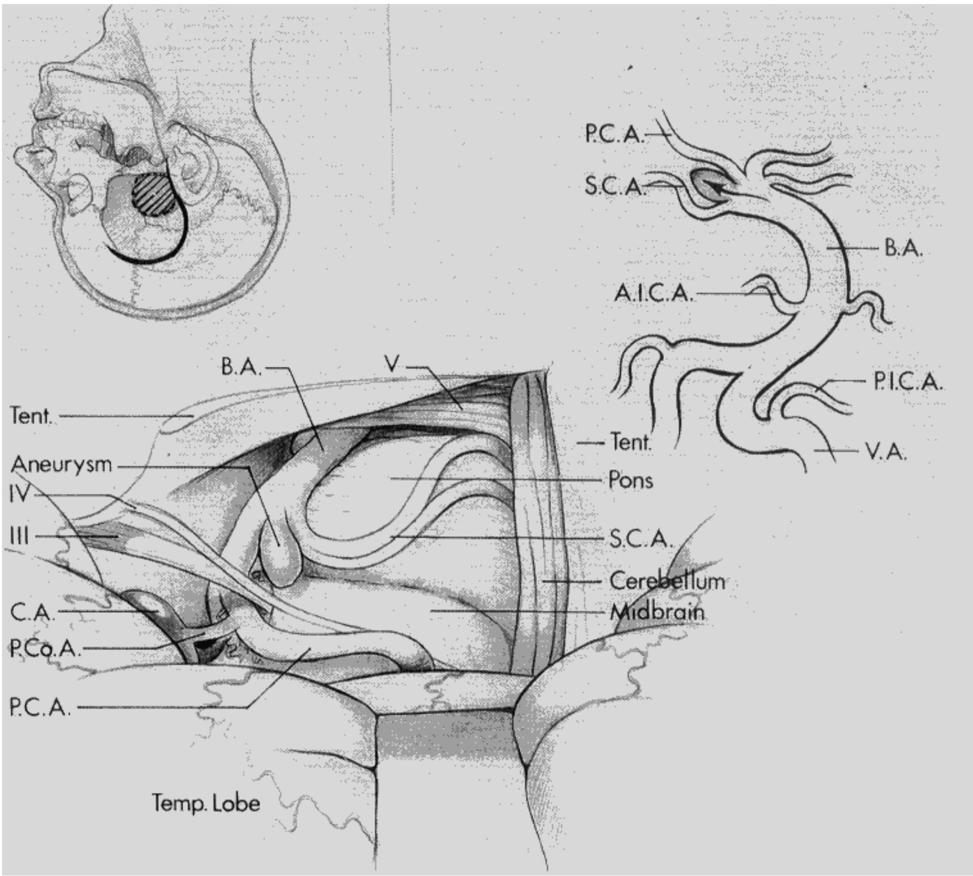



Basilar apex aneurysm is shown arising at the origin of the posterior cerebral arteries as exposed by a right anterior subtemporal craniotomy.

Note scalp incision and bone flap or craniectomy.

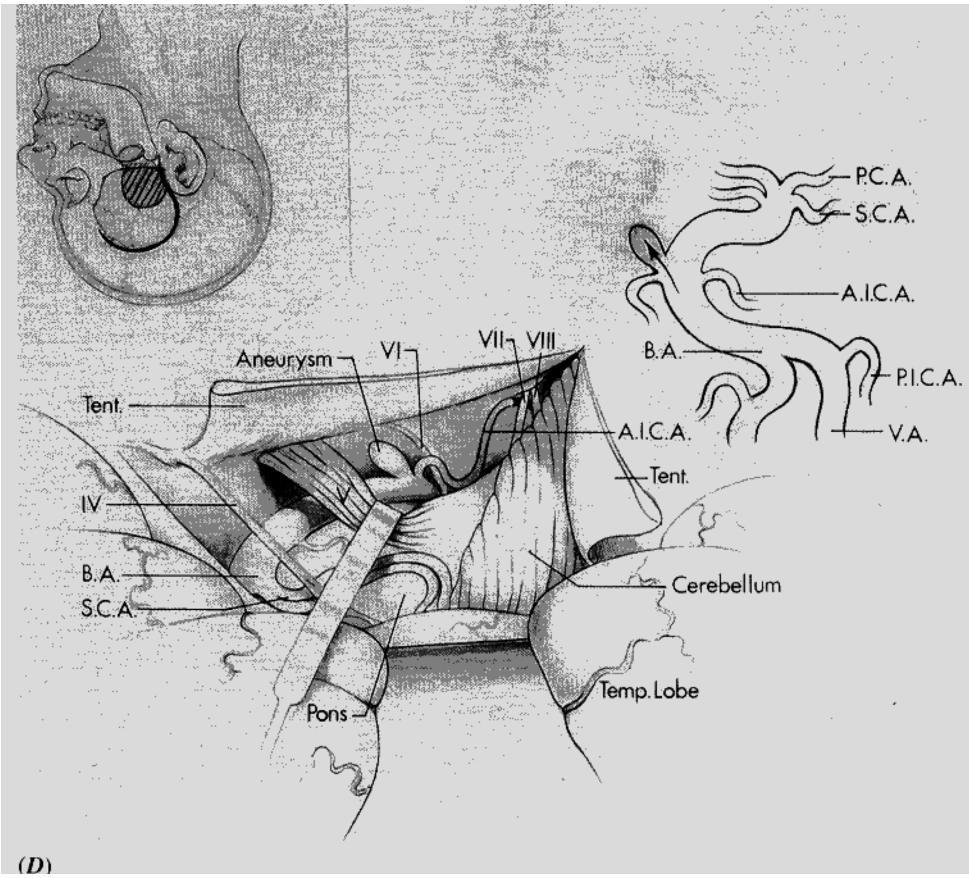
The retractor is on the temporal lobe and the tentorium cerebelli Tent has been divided to expose the basilar, posterior cerebral, superior cerebellar, posterior communicating (P.Co.A.), and internal carotid(C.A.) arteries and the oculomotor(III), trochlear (IV), and trigeminal(V) nerves.

*(After Wilkin:2000).*



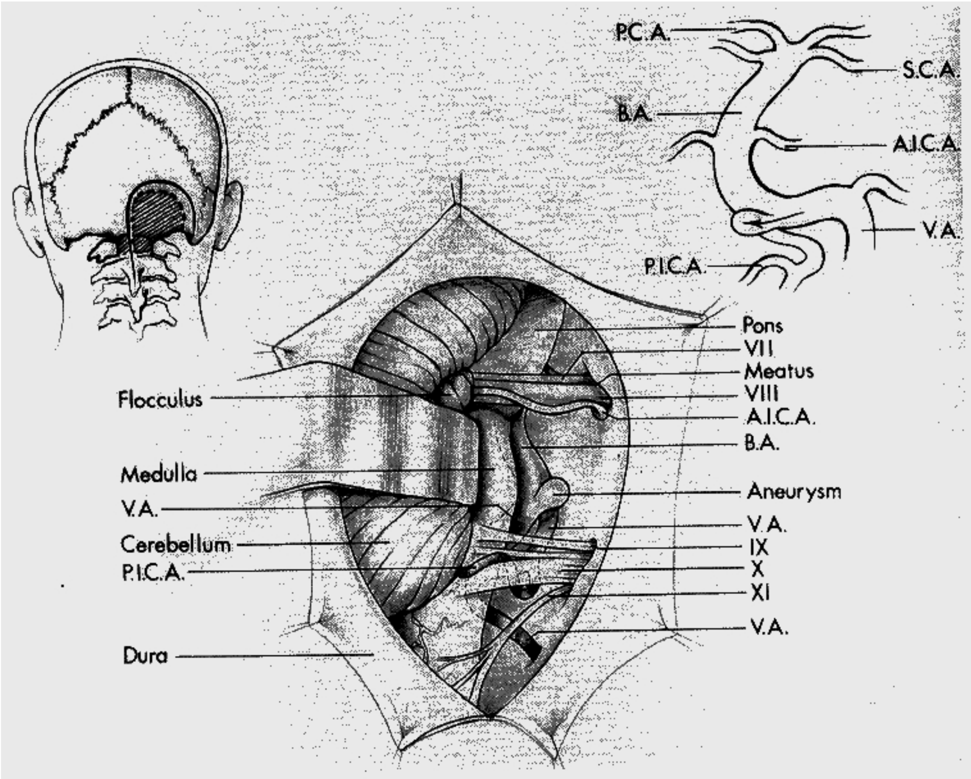

Anterior subtemporal exposure of abasilar aneurysm arising between the origin of the superior cerebellar and posterior cerebral arteries.The basilar artery curvature creates a hemodynamic thrust (arrow) against the wall of the artery at the junction of the upper two branches of the basilar artery.The aneurysm projects laterally below or into the oculomotor nerve.

*(After Wilkin,2000).*




Anterior subtemporal exposure of a basilar aneurysm arising at the origin of the anterior inferior cerebellar artery.
The abducens nerve (VI) is below the anterior inferior cerebellar artery.

*(After ,Wilkin,2000).*

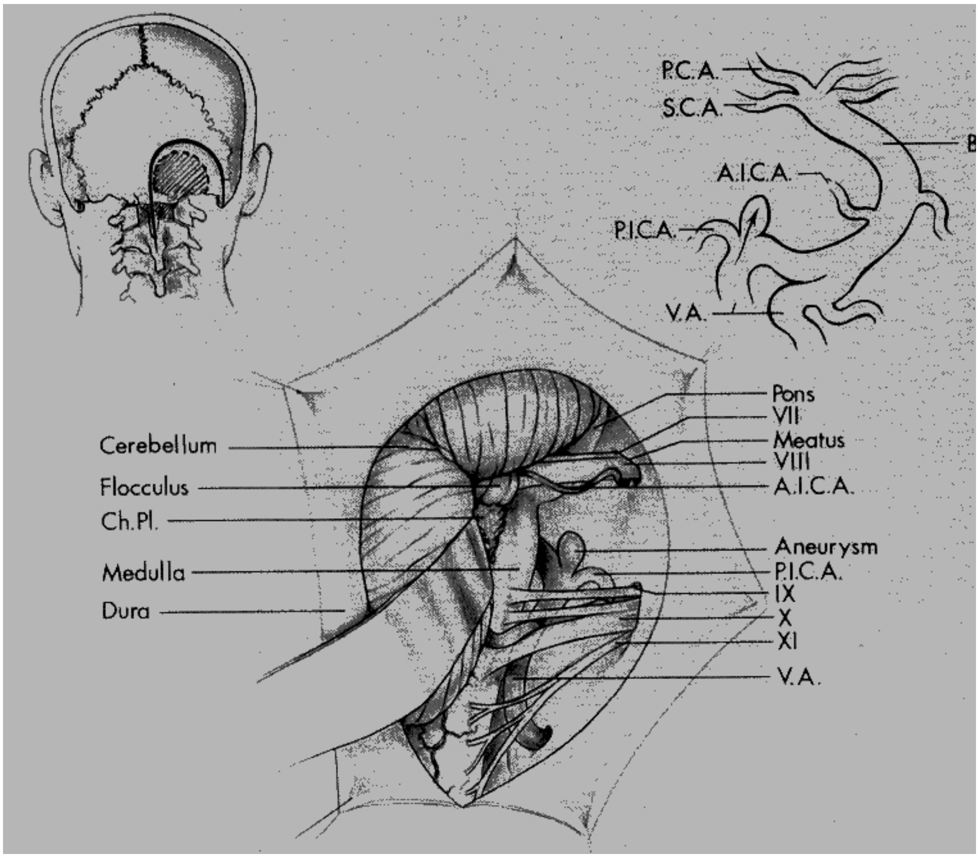



Suboccipital exposure of an aneurysm arising at the junction of the vertebral and basilar arteries

The patient is in the sitting position. The right half of the cerebellum is retracted to expose the facial, vestibulocochlear, glossopharyngeal (IX), vagus (X), and sspinal accessory (XI) nerves and the internal acoustic meatus. One of the vertebral arteries often joins the other in a configuration resembling the branching seen at other aneurysm sites.

Angiographic views in multiple projections reveal the aneurysm pointing in the direction of flow in the preaneurysmal segment of the larger vertebral artery.

*(After,Wilkin,2000).*




Suboccipital exposure of an aneurysm rising at the origin of the right vertebral and posterior inferior cerebellar arteries. The angulation of the vertebral artery creates a hemodynamic thrust arrow) in the direction in which the aneurysm points.
The flocculus and choroid plexus (Ch.PI protrude into the cerebellopontine angle.

*(After,Wilkin,2000).*

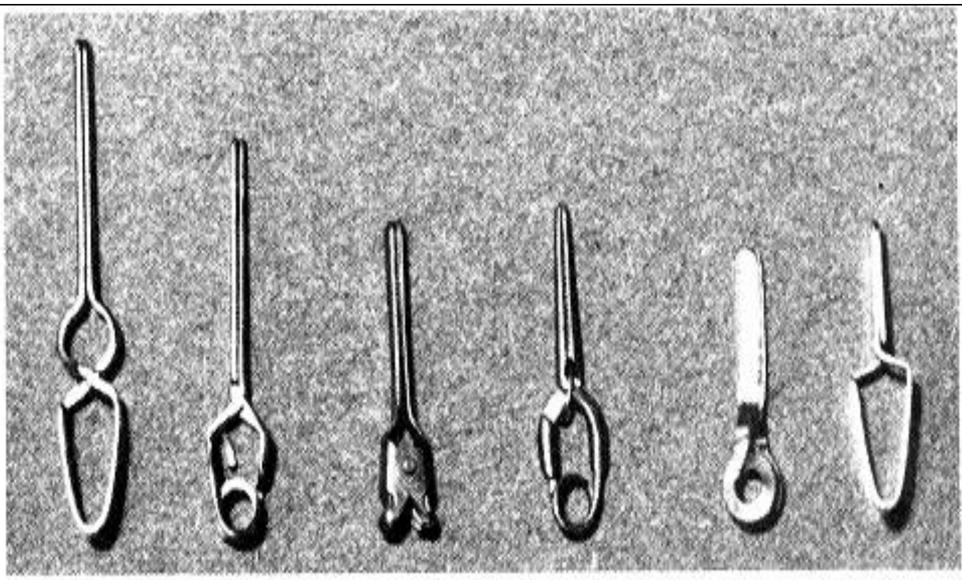
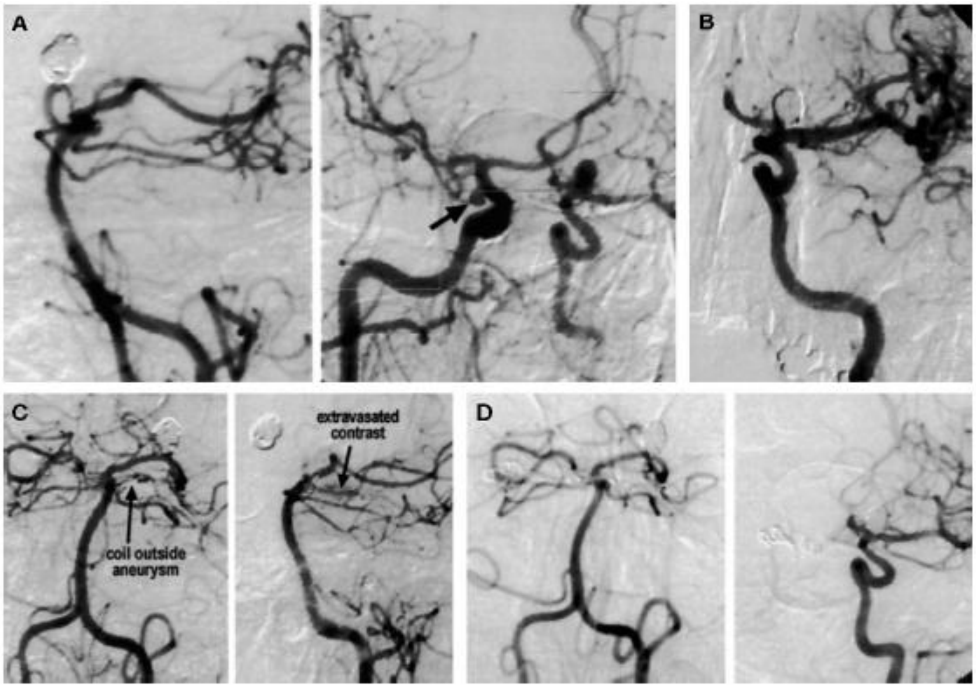


**Figure 220-1** Various aneurysm spring clips. *Left to right:* Drake, McFadden, Heifetz, Yasargil, Scoville, and Mayfield designs.






*A,* diagnostic arteriograms demonstrating the left SCA, right posterior carotid wall, and left ICA bifurcation aneurysms. *B,* immediate postembolization view of left ICA bifurcation aneurysm; residual can be seen. *C,* SCA aneurysm with a portion of the coil outside the fundus and extravasated contrast in the subarachnoid space. *D,* 15-month follow-up arteriogram demonstrating the clipped SCA aneurysm and complete thrombosis of the left ICA bifurcation aneurysm.