The Management Principles of Anterior Circulation Disease (ACD) do not apply to the Posterior Circulation (PCD):Time for a new Approach to PCD

James I. Ausman MD, PhD

[Department Of Neurosurgery, Multidisciplinary UCLA Stroke Center]

Results (cont)

Introduction and Methods

This presentation is a review of 70 yeears of literature of Posterior Circulation Disease (PCD)

Results

Pathology:

1) The pathology of atherosclerosis in the Posterior Circulation (PC) demonstrates differences between each vertebral artery. 2) Vertebral arteries are smaller than the carotids. 3) Vertebral arteries have more stenoses than carotids. 4) Stenosis in the vertebrals will produce symptoms sooner than the same stenosis in the carotids. 5) VB stenosis is 50% higher in the PC than AC. 6) Less ulcerated plaques are found in the PC. 7) Thrombus occurs in these plaques that can embolize. 8) The less the collateral in the PC, the greater chance of a PC disease process. 8) Occlusion of one vertebral does not assure adequate posterior circulation. Clinical Presentation:

1) Studies on Subclavian Steal prove that PCD symptoms can also be hemodynamic. 2) Clinically, PCD has symptoms for up to 6 months prior to infarct and a rapid onset with greater risk than ACD. 3) No large clinical studies or Registries have been done without some bias in patient selection. 4)
Thus, the natural history of PCD is not known. 5) The National Stroke
Guidelines for symptoms are too late to treat the disease.
Medical Treatment

1) Medical treatment has been based on carotid disease treatment. *Imaging:*

 Imaging relying on CT and 3T MR technologies is inadequate to show lesions in the PC. 2)Angiography is still the gold standard of diagnosis.
 Interventional therapy has not been successful in PCD.

Surgical Treatment:

1) In selected series all surgicaly treated pateints who failed maximal medical threapy, represesnt a subset of PCD not studied medically. 2) In these patients Surgical treatment of vertebral origin disease has a 94% success rate. 3) EC-IC bypass surgery was discarded with the EC-IC Bypass Study, when PCD was not even studied. Surgical Treatment (cont) 4) EC-IC bypass studies for intracranial PCD collectively show 80% improvement in symptoms or cure. 5) The longer one waits to defer surgery in this subset, the higher the risks of surgery become. Quantative Magnetic Resonance Angiography (QMRA):

1) Recent evidence from RCT using QMRA flow technology, show that those with normal PC flow can be differentiated from those with low flows, who have a high risk for infarction. 2) Surgery for the latter group normalizes their outcomes. 3) 7 Tesla MRA will surpass IA angiography in detail but is not commonly available.

Conclusions:

The Posterior Crculation is totally different than that of the Anterior Circulation anatomically, pathologically, symptomatically, and in imaging modalities, diagnosis, and surgical treatments. New diagnostic and management approaches are necessary for proper tratment of PCD.

Learning Objectives

PCD is different than ACD pathologically, clinically, diagnostically, symptomatically and in treatment. New approaches to PCD are required.

References

References on request to the first author. JAusman@mednet.ucla.edu