Bilateral Carotid Ligation

Case Report

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Although bilateral carotid ligation is less extensively used and reported than the unilateral method in the treatment of intracranial vascular lesions, it nevertheless has produced good results in certain cases.1,4,5,8 This report describes a patient who had a large arteriovenous malformation in the diencephalon and who was treated successfully with bilateral carotid ligation.

Case Report

An 18-year-old Korean man was admitted to the Seoul Red Cross Hospital on September 26, 1964, because of repeated acute episodes of severe headache, vomiting, and stiffness of the neck over the past 3 years.

Examination. The patient was slightly confused and stuporous. The blood pressure was 120/60 mm Hg, pulse 84, respiration 24/min, and temperature 38.2°C. There was moderate neck stiffness. Bilateral Babinski responses could be elicited. The striking finding was a loud cranial systolic bruit which was best perceived over the eyes and temples. Percutaneous compression of the left common carotid artery resulted in disappearance of the cranial bruit; similar compression of the right common artery had no effect. The patient experienced no ischemic neurological signs as a result of carotid occlusion which was maintained for 20 minutes on each side.

Routine laboratory studies, which included estimation of hemoglobin, white blood cell count, and urinalysis, were normal. Lumbar puncture done shortly after admission yielded clear pink cerebrospinal (CSF) fluid. The CSF pressure was 600 mm H2O. Bilateral carotid arteriography on the day of admission revealed a large arteriovenous malformation situated on the medial aspect of the right cerebral hemisphere (Fig. 1). Feeding arteries included the right anterior choroidal, right middle cerebral, and both anterior cerebrials. In retrospect, the study would have been more complete if the posterior circulation had been examined at this time.

Operation. It was elected to treat the intracranial vascular lesion by gradual ligation of the left common carotid artery. Accordingly, on October 5, a dissection of the left side of the neck was performed under local anesthesia (1% procaine). A Poppen-Blalock clamp was placed about the left common carotid artery approximately 2 cm proximal to its bifurcation. The clamp was initially given 3 of the 7½ turns necessary to accomplish complete occlusion of the artery. Immediately following surgery, closure of the clamp to within one-quarter turn of full occlusion produced a 30% reduction in the ipsilateral mean retinal artery pressure as measured by ophthalmodynamometry, but by the next morning the reduction was only 8%. At this time, the clamp was closed tightly about the artery with a resulting 16% reduction in ipsilateral retinal artery pressure. Two days following surgery, however, the mean retinal artery pressure on the side of the carotid ligation showed only a 7% reduction in comparison with the opposite eye. Ten days following surgery, the retinal artery pressures were equal.

There were no neurological sequelae as a result of ligation of the left common carotid artery. Ligation of the left carotid artery had produced a significant, but temporary, reduction in intensity of the intracranial bruit. On the day following complete occlusion of the carotid artery with the clamp, the intracranial bruit had returned to its original intensity. On October 8, the clamp was removed and the left common carotid artery ligated. Right carotid arteriography performed on October 19 demonstrated essentially no

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change in the intracranial vascular lesion (Fig. 2).

Because of the recurrence of the bruit to its original intensity, the insignificant difference in retinal artery pressure following carotid ligation, and the unchanged appearance of the intracranial vascular lesion on postoperative arteriography, it was decided to perform carotid ligation on the right side. Beginning on October 21, percutaneous occlusion (Matas' test) of the right common carotid artery was performed daily. Initially,