

Postoperative somnolence in patients after carotid endarterectomy

Donald L. Akers, MD, Mark R. Brinker, MD, Tod C. Engelhardt, MD, and Morris D. Kerstein, MD, New Orleans, La.

Eighty-one patients undergoing carotid endarterectomy were divided into two groups based on the degree of stenosis of the carotid artery. Group I, 37 patients, was defined as having severe carotid stenosis ($>70\%$). Group II, 44 patients, was defined as having mild ($<40\%$) or moderate (40% to 70%) carotid artery stenosis. Both groups were evaluated for neurologic and psychologic changes in the postoperative period. Prospective analysis demonstrated no significant differences between groups I and II in the areas of cardiac disease, history of preoperative stroke, preoperative and postoperative hypertension, diabetes, or postoperative computed tomography changes. Group II had a significantly higher percentage of carotid artery ulceration ($p < 0.01$). Postoperative analysis revealed 34 group I patients had 6 to 8 weeks of lethargy versus two group II patients ($p < 0.01$). Eleven group I patients had headaches for the first week postoperatively versus three patients in group II ($p < 0.05$). Four group I patients had paranoid ideation, and another four patients had clinical depression, but not one patient in group II ($p < 0.01$) had these psychiatric disturbances. These data suggest that significant, reversible neurologic and psychologic changes can occur because of reperfusion after relief of severe stenosis of the carotid artery. (SURGERY 1990;107:684-7.)

From the Department of Surgery, Tulane University School of Medicine, New Orleans, La.

INVESTIGATIONS CONCERNING NEUROLOGIC CHANGES after carotid endarterectomy have usually focused on the all-or-none aspect of either cerebrovascular accident or cranial nerve dysfunction. Recent studies, however, have investigated more subtle pathologic changes in mental status associated with carotid endarterectomy. Carotid endarterectomy on the severely stenotic carotid artery lesion results in a marked increase in blood flow to the ipsilateral cerebral hemisphere,¹ which can result in a cerebral hyperperfusion syndrome. The mental status changes (*somnolence*) include a marked increase in postoperative lethargy, increases in psychiatric complaints including paranoid ideation and clinical depression, and increased frequency and severity of headaches. These symptoms usually resolve after 6 to 8 weeks; however, some severe cases have progressed to seizures, intracerebral hemorrhage, and death.

This study was designed as a prospective evaluation of severe carotid artery stenosis. Two groups of patients

were selected on the basis of the severity of stenosis. All other preoperative risk factors were comparable between the two groups. The patients received a general psychologic and neurologic assessment preoperatively and again postoperatively. It was the purpose of this study to determine if significant reversible mental status changes are associated with carotid endarterectomy of the severely stenotic carotid artery lesion.

MATERIAL AND METHODS

Preoperatively all patients underwent both arteriography and duplex scanning and were divided into two groups based on the severity of stenosis of the carotid artery. Group I consisted of 37 patients classified as having severe carotid artery stenosis (range, 70% to 99%; mean, $86\% \pm 8\%$) and comprised 23 men and 14 women, whose ages ranged from 55 to 76 years (mean, 64.6 ± 6.3). Group II consisted of 44 patients classified as having mild-to-moderate carotid artery stenosis (mild, 10% to 39%, 34 patients; moderate, 40% to 70%, 10 patients; mean, $30\% \pm 11\%$) and comprised 26 men and 18 women, whose ages ranged from 58 to 76 years (mean, 66.7 ± 5.8). The indications for carotid endarterectomy were (1) a transient ischemic attack, (2) an

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Reprint requests: Morris D. Kerstein, MD, Department of Surgery, Tulane University School of Medicine, 1430 Tulane Ave., New Orleans, LA 70112.

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