Q: Does a carotid bruit predict cerebrovascular complications following noncardiac surgery in asymptomatic patients?

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A: A carotid bruit is a poor marker for significant carotid stenosis and does not predict perioperative stroke. Further evaluation and consideration for surgical treatment are warranted only in patients with recent neurovascular events such as stroke or transient ischemic attack.

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Perioperative stroke and relationship to carotid stenosis

Despite advances in surgical technique and improvements in medical care, the incidence of perioperative stroke has not decreased in recent years, likely reflect-

ing the aging of the population and the increased number of patients with comorbid medical conditions.[1] Likewise, its consequences remain substantial: in one large retrospective study, perioperative stroke after general surgery carried a poor prognosis: 8% of patients experienced full recovery, 43% were left with some disability but were still independent, 31% were left with full disability, and 18% died.[2]

Carotid atherosclerosis is believed to be responsible for 30% of perioperative strokes,[3] with the large majority of these events occuring at the time of surgery or within the first 48 hours after surgery.[4] Retrospective studies of all perioperative strokes suggest that 45% occur on the first day and 55% occur between postoperative days 2 and 30.[1]

Carotid bruit: Not a reliable marker for stenosis

The presence of a carotid bruit is not a reliable marker for carotid artery stenosis, and cannot be relied upon to determine the need for further investigation or treatment.

Carotid bruits are heard in 4% of the general population older than 40 years of age and in up to 14% of patients older than 55 years undergoing noncardiac surgery.[5] The prevalence of asymptomatic carotid stenosis greater than 50% was found to be 6.4% in a population-based study of 500 volunteers aged 50 to 79 years.[6]

In a recent prospective study of 153 patients undergoing coronary artery bypass graft surgery,[7] the positive predictive value of carotid bruit as a marker for significant ($\geq$ 50%) carotid stenosis was 25% and the negative predictive value was 95.5%. In addition, more than 3% of patients with critical stenosis did not present with a bruit. Older studies in unselected medical patients have found bruits to have still lower positive and negative predictive values for critical stenosis.[7]

Carotid bruit and perioperative stroke: No association

The risk of perioperative stroke in general surgery patients is very low. A prospective study of 2,463 general surgery patients with a mean age of 65 years revealed an incidence of perioperative stroke of only 0.2%.[8]

The predictive value of carotid bruit for stroke in otherwise unselected patients was assessed in a prospective study of 735 patients undergoing general and vascular surgery.[5] The investigators found that although 14% of patients had carotid bruits, the stroke rate (0.7%) was similar between those who had bruits and those who did not. These authors pooled this study's findings with data from five other studies (2,205 patients in total) and again found no difference in stroke rates between patients with and without bruits, which further argues that the presence of a bruit does not predict perioperative stroke.[5]

No clear role for preoperative carotid endarterectomy

Furthermore, surgical correction of severe carotid stenosis in patients without prior neurologic symptoms (stroke or transient ischemic attack) is not indicated prior to noncardiac surgery. A recent prospective randomized trial enrolled 79 neurologically asymptomatic patients with carotid stenosis of 70% or greater who were undergoing major vascular surgery.[9] Patients were randomized to carotid endarterectomy performed either 1 week prior to surgery or 1 to 6 months after surgery. At 1-month follow-up, there were no neurologic events in either group and no mortality difference between groups. Two patients in the second group suffered small strokes, at days 65 and 78, both of which occurred prior to carotid endarterectomy. No other randomized prospective studies have been conducted.

Conclusions

Carotid bruit is a poor marker for significant carotid stenosis. Patients without prior neurologic symptoms (transient ischemic attack/cerebrovascular accident) who are undergoing noncardiac surgery are at minimal risk for perioperative stroke, and no additional studies or surgical interventions are required.

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