



Safety and Efficacy of Surgical Resection of Unruptured Low-grade Arteriovenous Malformations from the Modern Decade

Karam Moon MD; Michael Robert Levitt MD; Peter Nakaji MD; Felipe Albuquerque MD; Joseph M. Zabramski MD, FAANS, FACS; Cameron G. McDougall MD; Robert F. Spetzler MD

Introduction

Recent studies have questioned the utility of surgical resection of unruptured brain arteriovenous malformations (bAVMs). We performed an assessment of outcomes and complications of surgical resection of low-grade bAVMs (Spetzler-Martin Grade I or II) at a single high-volume neurosurgical center.

Methods

We reviewed all unruptured low-grade bAVMs treated with surgery (with or without preoperative embolization) between 01/2004 and 01/2014. Stroke rate, mortality, and clinical and radiographic outcomes were examined.

Results

Of 95 patients treated surgically, 85 patients (25 Grade I, 60 Grade II) met inclusion criteria, and all achieved radiographic cure postoperatively. Ten patients (11.8%) were lost to follow-up; the mean follow-up of the remaining 85 was 3.3 years. Three patients (3.5%) with Grade II bAVMs suffered stroke; no patients died. Although 20 patients (23.5%) had temporary postoperative neurological deficit, only 3 (3.5%) had new clinical impairment (mRS [modified Rankin Scale] score = 2) at last follow-up. Eight of the 13 patients (61.5%) with preexisting clinical impairment had improved mRS scores of 0 or 1; and 17 of 30 patients (56.7%) with preoperative seizures were seizure-free without antiepileptic medication postoperatively. No significant differences existed in stroke rate or clinical outcome between Grade I and II patients at follow-up (Fisher exact test, P = .55 and P > .99, respectively).

Conclusions

Surgical resection of low-grade unruptured bAVMs is safe, with a high rate of improvement in functional status and seizure reduction. Although transient postoperative neurological deficit was observed in some patients, permanent treatment-related neurological morbidity was rare.

Learning Objectives

1. Describe the treatment options for low-grade AVMs
2. Describe the outcomes and complication rates for surgical resection of low-grade AVMs
3. Describe the rate of seizure improvement following surgical resection
4. Describe future research questions regarding management of low-grade AVMs

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