Brainstem Cavernous Malformations Resected Via Miniature Craniotomies

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Introduction

Brainstem cavernous malformations (BCMs) can cause devastating neurologic disability when they hemorrhage. Annual symptomatic bleed rates are higher for lesions in the brainstem as compared to other locations, reported as high as 60.9%. We present a case series of patients who underwent surgical resection for a variety of BCMs using minimally-invasive craniotomies (MICs).

Methods

Approach was chosen by location of the presentation of the BCM to the brainstem surface and the long axis of the lesion. Once the lesion was accessed, resection occurred through our described standardized method. Radiologic follow-up in all cases was undertaken to confirm extent of resection.

Results

Seven patients were treated with MICs for complete surgical excision of BCMs during this time period. All patients had experienced at least 1 hemorrhage prior to presentation. Postoperatively, there were 3 instances of transient neurologic symptoms, all of which resolved at last follow-up. All 7 patients experienced neurologic improvement after surgery, with 4 patients showing no deficits at last follow-up. Approach selection rationale and technical nuances are presented on a case-by-case basis.

Conclusions

With carefully planned MIC approaches to BCMs presenting to the brainstem surface, excellent results may be achieved without the necessity of larger conventional craniotomies. We believe these nuances may be of use to others in treating these challenging lesions.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the feasibility of miniature "keyhole" craniotomies for the resection of brain stem cavernous malformations, 2) Discuss, in small groups, the technical considerations based on the anatomic characteristics of lesions in various brainstem locations.

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