

# Clinical Presentation and Natural History of Intramedullary Spinal Cord Cavernous Malformations

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## Introduction

In comparison to cerebral cavernous malformations, there is a paucity of literature investigating the clinical course of patients with spinal intramedullary cavernous malformations (SCMs). While surgical resection of SCMs is generally recommended after multiple symptomatic hemorrhages, surgical indications are not well-defined due to a limited understanding of the natural history of these lesions. Herein, we present a large, single-institution retrospective case series of SCMs.

## Methods

We reviewed records of patients diagnosed with SCMs between 1995-2016. Patients were considered to have a SCM on the basis of radiographic criteria/pathologic confirmation after surgical resection. Hemorrhage was defined as clinical worsening in tandem with radiographic changes visualized on follow-up MRI. Neurologic status was assessed by the Modified McCormick score. Risk factors for hemorrhage were determined using a Cox proportional hazards model.

## Results

There were 107 patients meeting our inclusion criteria. The mean age of our cohort was 49.6 (+/- 17.3) years with 48 females (45.0%). Follow-up data was available for 85 patients. While 21 (24.7%) patients underwent immediate surgical resection, 64 (75.3%) were initially managed conservatively. Among this group, 16 (25%) suffered a hemorrhage during follow-up and 11 (17.2%) required surgical resection due to interval bleeding or neurologic worsening. The overall annual risk of hemorrhage was 6.2% per person year. The rate among patients who were symptomatic and asymptomatic on presentation was 9.5% and 0.8%, respectively. Median time to hemorrhage was 2.3 years (0.1-12.3). Univariate analysis identified increasing SCM size ( $p=0.028$ ), history of prior hemorrhage ( $p=0.013$ ) and presence of symptoms ( $p=0.002$ ) as risk factors for subsequent hemorrhage. Multivariable proportional hazards analysis revealed large SCM size (Unit RR 1.22, 1.01-1.49;  $p=0.042$ ) and presence of symptoms to be independently associated with hemorrhage during follow up (RR 9.87, 1.96-179.64,  $p=0.003$ )

## Conclusions

Surgery may be considered in large, symptomatic SCMs to prevent

## Learning Objectives

By the conclusion of this session, we expect the participants to 1) Understand the natural history of intramedullary spinal cavernous malformations 2) Understand the importance of surgical resection in selected spinal cavernomas

## References