



Increased Risk of Recurrent Pediatric Arteriovenous Malformation Following Hemorrhagic Presentation

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Introduction

The majority of pediatric patients with cerebral arteriovenous malformation (AVM) present with intracranial hemorrhage. Angiographic-confirmed obliteration after microsurgical resection is traditionally considered curative though delayed recurrence may occur, especially in children. We review our experience treating pediatric AVMs and evaluate for hemorrhagic presentation as a risk factor for delayed recurrence.

Methods

The records of 37 pediatric patients who underwent microsurgical resection of AVM (10 girls: 27 boys) over a 10 year period were reviewed. Presence of intracranial hemorrhage at time of presentation, residual AVM on postoperative angiogram, and delayed recurrence of AVM after angiographic-confirmed obliteration was assessed.

Results

24 (65%) patients presented with spontaneous intracerebral hemorrhage. 19 (79%) patients with ruptured AVM and 12 (92%) patients with unruptured AVM had no evidence of residual on post-operative angiogram. 5 (21%) patients with ruptured AVM and negative post-operative angiograms developed recurrent AVM requiring further treatment during their follow-up period. No patients with unruptured AVM and negative post-operative angiogram developed recurrence. No patients developed delayed hemorrhage.

Conclusions

The majority of pediatric AVMs presented with intracranial hemorrhage. Only patients with hemorrhagic presentation went on to develop recurrent AVM, and residual AVM on post-operative angiogram was more likely in the ruptured AVM group. Recurrence may be due to growth after occult residual arteriovenous shunt, or delayed visibility of residual lesion due to angiographic masking of AVM vessels by post-hemorrhagic edema. Late angiographic follow-up after resection of ruptured AVM may be warranted.

Learning Objectives

By the conclusion of this session, participants should be able to:
1)describe the influence of presenting hemorrhage on recurrence of pediatric AVM,
2)Discuss possible contributing factors for increased recurrence risk with ruptured AVM

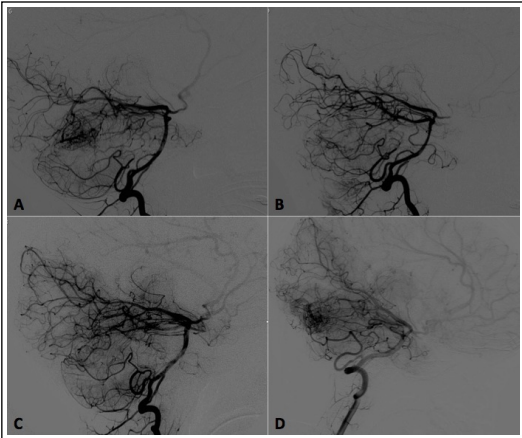


Figure 1. 8 year-old male with ruptured AVM. **A:** Angiographic appearance on presentation. **B:** Immediate post-operative angiogram. **C:** 3-month post-operative angiogram. **D:** One-year post-operative angiogram demonstrating recurrence of AVM.