Evolution of Perioperative Care of Pediatric Patients after AVM embolization: A Single-Institution Experience

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Introduction
We present a series of 16 patients (8 mo – 20 yr of age) who had embolization of brain arteriovenous malformations (bAVM), in order to illustrate the evolution of their care over a five-year period in our institution. In many cases, the safety of surgical resection of bAVM can be enhanced by preoperative embolization. A key element in the care of these patients involves avoidance of spikes in blood pressure, particularly for partially embolized lesions, given the risk of hemorrhage. This goal is achieved with sedation, but that can run counter to the equally important need for regular neurological examinations best performed in alert patients. While several authors have commented on the desirability of maintaining stably low blood pressure in post-embolization patients, we found no discussion of concrete approaches to achieve this, especially with regard to the competing needs of calm participation with neurological exams and maintenance of normotension in children.

Evolution of Care

Initial Post-embolization Protocol (Fig 1, Left arm)
- 11 patients in group
- Patient kept intubated, sedated
- BP strictly controlled
- Neurologic exam not always possible

Impetus for Change
- Patient experienced unrecognized intracranial hemorrhage

Revised Post-embolization Protocol (Fig 1, Right arm)
- 4/4 patients able to cooperate with exam
- All patients’ BP below predetermined maximum
- No adverse events

Conclusion
- Two potentially conflicting imperatives post-embolization:
  - Risk of agitation and elevated blood pressure \(\rightarrow\) increased risk of hemorrhage
  - Need for regular neurologic examination
- Early strategy emphasized sedation and BP control at expense of neurologic exam
- New protocol allows both goals to be met
- Multidisciplinary collaboration and regular re-evaluation during the formulation of management strategies is essential
- Greater numbers of patients needed to fully assess outcomes for new protocol, early results promising

References