

## **Stereotactic Radiosurgery for Cerebral Arteriovenous Malformations After Embolization with n-butyl Cyanoacrylate (n-BCA)**

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### **Introduction**

Previous literature has suggested lower obliteration rates of AVMs embolized prior to therapy with SRS. Cited causes include recanalization, induced angiogenesis, shielding effects, poor targeting due to imaging artifacts of embolic materials. However, favorable outcomes have also been observed in patients treated with these therapies. We present our series of patients treated with NBCA embolization and SRS, in order to evaluate the effects on obliteration rates and outcomes.

### **Methods**

Retrospective review of patients treated at the Puerto Rico Medical Center for cerebral AVMs from 2000 to 2015. Patients that underwent embolization with NBCA followed by SRS (Gamma Knife® Radiosurgery) were selected. All patients had follow-up diagnostic imaging (contrast-enhanced MRI, MRA or DSA) after both therapies. The clinical outcomes, obliteration rates and complications were analyzed.

### **Results**

A total of 22 patients (59% male and 41% female) were embolized with NBCA and received GKS after embolization. Complete obliteration was achieved in 18 patients (81.8%). Partial obliteration was obtained in 4 patients (18.2%). Significant complications included radionecrosis in 3 patients (13.6%).

### **Conclusions**

Embolization of cerebral AVMs with NBCA before GKS did not appear to reduce obliteration rates in our series. The use of NBCA as embolisant agent, inclusion of cerebral angiograms during planning and targeting, may help obtain angiographic and clinical results similar to those in patients undergoing radiosurgery without prior embolization.

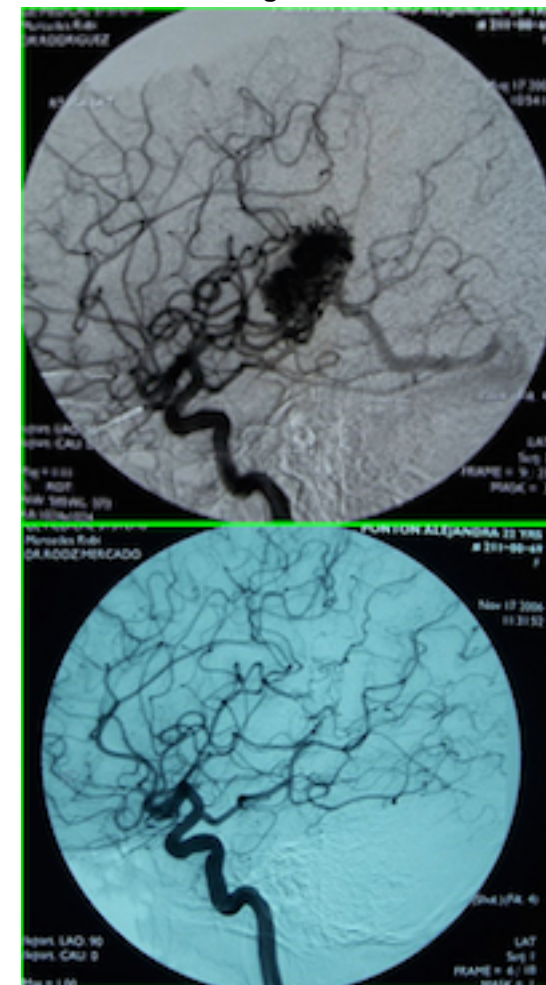
### **Learning Objectives**

1) Describe the role for endovascular embolization of AVMs prior radiosurgery.

### **References**

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**Figure 1**



20 y/o woman with right temporal AVM before treatment (above). No residual AVM seen at 2 years follow up (below).