AANS/CNS Joint Cerebrovascular Annual Meeting
February 20-21, 2017
Houston, TX

Heterogeneity of Treatment Risk Profile in Patients with Low-Grade Arteriovenous Malformations (AVMs)

Teresa Easwaran BS, MS; Wuyang Yang MD MS; Alice Hung; Jose Luis Porras; Tomas Garzon-Muvdi MD MS; Justin M. Caplan MD; Geoffrey P. Colby MD, PhD, FAANS; Alexander Lewis Coon MD; Rafael J. Tamargo MD; Judy Huang MD
Johns Hopkins University School of Medicine

Introduction

Microsurgery is presumed the most preferred treatment for low-grade AVMs. However, some of these AVMs may have an alternative option, such as radiosurgery, to minimize treatment risk. Through comparison with the surgical sub-cohort, we aim to identify possible sub-cohorts of patients that are optimal for radiosurgery.

Methods

Retrospective chart review of 763 patients with AVMs seen in our institution between 1990-2015 was collected. Patients with grade 1/2 AVMs that were treated by surgery or radiosurgery were included. Those with missing data, loss-to-follow-up or with hereditary hemorrhagic telangiectasia(HHT) were excluded. Patient baseline data were collected and compared between radiosurgery and surgery cohorts. Outcome was assessed by obliteration status and functional outcome using modified Rankin Scale(mRS).

Results

Of the 254 low-grade AVMs found, 186(73.2%) were included after application of exclusion criteria. Mean age was 37.5+/-17.4 years with 47.8% male. Ninety-four patients underwent radiosurgery and 92 received microsurgery. Spetzler-Martin grades were: grade 1(25.8%) and grade 2(74.2%). The average size was 2.1cm without difference between two treatment groups(p=0.552). More grade 2 patients were managed by radiosurgery(p=0.006), and more ruptured AVMs(n=80, 43.0%) tend to be surgically managed(n=46, 50%; p=0.057). Obliteration was 95.7% by surgery and 41.5% by radiosurgery($p<0.001$), and follow-up mRS displays no difference(p=0.892). Obliteration was achieved in all two brainstem lesions for radiosurgery, while none was attempted for surgery(p=0.032). Similarly, 80% of the paramedian lesions were obliterated by radiosurgery, while none underwent surgery(p=0.022). Of patients with improved/unchanged mRS, 52.6% of those who underwent radiosurgery had lesions in eloquent areas, compared to only 35.8% in surgery(p=0.033).

Conclusions

There may be a subset of low-grade AVMs that are more suitable for radiosurgery than surgery. We identified paramedian lesions and eloquent location as potential subgroups to consider for radiosurgery. More studies should be conducted in this cohort to confirm our findings and subsequently refine an algorithm for best management strategy.

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Raise awareness that some low-grade AVMs may be more suitable for radiosurgery

2) Understand that paramedian lesions, eloquent location (especially brainstem) may be potential indicators to consider radiosurgery