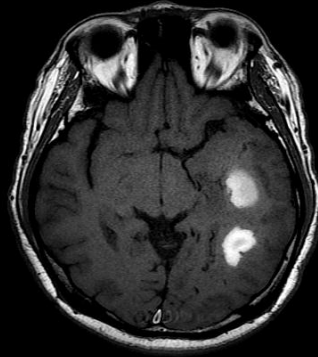


# Venous Hemorrhagic Infarction after Radiosurgery for a Cavernous Sinus Dural Arteriovenous Fistula



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# Introduction

## **Cavernous sinus dural arteriovenous fistulas (CSDAVFs)**

Most common location of DAVFs (20%-40%).

Chemosis, proptosis, ophthalmoplegia, and decreased visual acuity.

Rarely present with hemorrhage.

## **Treatments**

Transvenous embolization: effective and immediate obliteration.

Gamma Knife radiosurgery (GKRS): cure rate 65%-87%.

Conservative management: for low risk lesions.

Kiosue H, et al., *Radiographics*. 2004

Miller TR, et al., *Stroke*. 2015

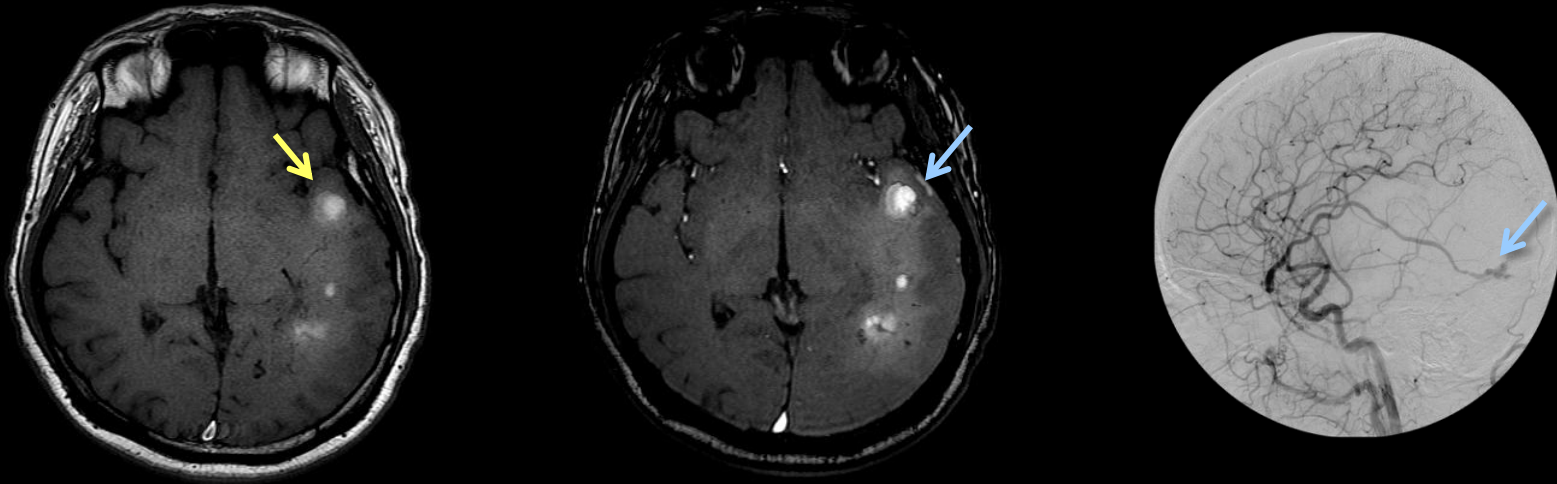
Wu HM, et al., *J Neurosurg*. 2006

Wu CA, et al., *J Neurosurg*. 2020

Kai Y, et al., *Neurosurgery*. 2007

# Case

A 42-year-old man with a CSDAVF was lost to follow-up after GKRS 5 years ago, and presented with aphasia in a month.



MRI showed **subacute hemorrhages** at left temporo-occipital area and a **flow-related enhancement** within a cortical vein on TOF MRA. Cerebral angiography revealed a residual left CSDAVF draining directly to the vein of Labbé with an outflow restriction.

# Discussion

Post-GKRS hemorrhage of CSDAVFs has rarely been reported, compared with that of DAVFs at other locations.

In a systemic review, Chen et al. showed that post-GKRS hemorrhages were observed in 0 of 295 CSDAVFs and in 3 of 237 non-CS DAVFs.

We report a post-GKRS residual CSDAVF presenting with hemorrhage, which was associated with **outflow restriction in the single drainage vein**. The underlying cause of the hemorrhage was thus considered to be **venous hemorrhagic infarction**.

Chen CJ, et al., *J Neurosurg*. 2015  
Hung YC, et al., *Neurosurgery*. 2020  
van Dijk JM et al., *Stroke*, 2002  
Giuseppe MDP et al., *Neurosurgery*. 2017  
Hu YS et al., *Radiology*. 2017

# Conclusions

Post-GKRS hemorrhage can occur in residual CSDAVFs with venous outflow restriction.

Patients with DAVFs should undergo clinical and imaging follow-up after GKRS.

Appropriate treatments should be given to DAVFs with high-risk Imaging features.

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**Thanks for your attention!**

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