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Stereotactic Radiosurgery for Transverse Sigmoid Sinus Dural Arteriovenous Fistulas: A Single-Institution Series

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Introduction

Stereotactic radiosurgery (SRS) has become an increasingly important tool for treating dural arteriovenous fistulas (DAVF). This is particularly true in patients considered poor candidates for microsurgery or endovascular obliteration. Most series so far have been single institution, retrospective studies that combine DAVFs of various locations in order to bolster numbers for analysis. It is clear that some characteristics portend a more favorable response to SRS as has been shown for DAVFs without cortical venous drainage. In this study, we limited our retrospective review only to DAVFs of the transverse sigmoid sinus thus eliminating any concern about differential response to SRS based on location.

Methods

Adult patients treated with SRS for transverse sigmoid DAVF between 2000 and 2015 were analyzed. The Cognard grade was recorded on initial cerebral angiogram and compared to the time to obliteration.

Results

There were 21 females and 14 males. Average age at time of SRS was 63.1 years. Average lesion diameter was 33.3 mm and average volume was 7951 mm^3. All patients received between 1500-2000 cGy with Iso of 40-50.
Cognard grades are shown below with obliteration rates and time to obliteration in brackets:

Grade I: 19 (16/19; 2.71 years)

Grade IIA: 7 (7/7; 3.0 years)

Grade IIA+B: 7 (3/7; 3.3 years)

Grade III: 2 (0/2)

Both the proportion of cases and the time to obliteration reached statistical significance with p values < 0.05 using z-test to compare proportion and Kaplan-Meier time to event analysis, respectively. Rates were equal for males and females.

One patient developed symptomatic radiation necrosis. There were no perioperative morbidities or deaths and there were no cases of hemorrhage between SRS and obliteration.

Conclusions

Transverse sigmoid sinus DAVF of Cognard Grades I and II are safely and effectively treated with SRS and warrant consideration as first-line therapy. The effect is not immediate and the time to obliteration lengthens with worsening grade.

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Learning Objectives

SRS is a safe and effective method for treating low Cognard Grade transverse sigmoid DAVFs.

DAVF obliteration time is dependent on complexity of the lesion as captured by a higher Cognard Grade.

References

1.Al-Mahfoudh R, Kirollos R, Mitchell P, Lee M, Nahser H, Javadpour M. Surgical disconnection of the cortical venous reflux for high-grade intracranial dural arteriovenous fistulas. World Neurosurg. 2015; 83(4): 652-6.

2.Chen CJ, Lee CC, Ding D, Starke RM, Chivukula S, Yen CP, et al. Stereotactic radiosurgery for intracranial dural arteriovenous fistulas: a systematic review. J Neurosurg. 2015; 122(2): 353-62.

3.Chen C-J, Lee C-C, Ding D, Starke RM, Chivukula S, Yen C-P, et al. Stereotactic radiosurgery for intracranial dural arteriovenous fistulas: a systematic review. J Neurosurg. 2015; 122(2): 353-62.

4.Hacein-Bey L, Konstas AA, Pile-Spellman J. Natural history, current concepts, classification, factors impacting endovascular therapy, and pathophysiology of cerebral and spinal dural arteriovenous fistulas. Clin Neurol Neurosurg. 2014; 121: 64-75.

5.Yen CP, Lanzino G, Sheehan JP. Stereotactic radiosurgery of intracranial dural arteriovenous fistulas. Neurosurg Clin N Am. 2013; 24(4): 591-6.

6.Yen C-P, Lanzino G, Sheehan JP. Stereotactic Radiosurgery of Intracranial Dural Arteriovenous Fistulas. Neurosurg Clin N Am. 2013; 24(4): 591-6.