Cavernous sinus dural arteriovenous fistula

The carotid-cavernous fistula (CCF) and the cavernous sinus dural arteriovenous fistula (dAVF) are two distinct vascular pathologies involving abnormal connections in or around the cavernous sinus.

This dural arteriovenous fistula, usually have a benign course, and may even resolve spontaneously.

Treatment

see Cavernous sinus dural arteriovenous fistula treatment.

Reviews

A systematic literature review was performed using PubMed. The cavernous sinus (CS) dural arteriovenous fistulas (DAVFs) and the noncavernous sinus (NCS) DAVFs were categorized using the Barrow and Borden classification systems, respectively. The DAVFs were also categorized by location and by the presence of cortical venous drainage (CVD).

Statistical analyses of pooled data were conducted to assess complete obliteration rates in CS and NCS DAVFs, and in DAVFs with and without CVD.

Nineteen studies were included, comprising 729 patients harboring 743 DAVFs treated with SRS. The mean obliteration rate was 63% (95% CI 52.4%-73.6%). Complete obliteration for CS and NCS DAVFs was achieved in 73% and 58% of patients, respectively. No significant difference in obliteration rates between CS and NCS DAVFs was found (OR 1.72, 95% CI 0.66-4.46; p = 0.27). Complete obliteration in DAVFs with and without CVD was observed in 56% and 75% of patients, respectively. A significantly higher obliteration rate was observed in DAVFs without CVD compared with DAVFs with CVD (OR 2.37, 95% CI 1.07-5.28; p = 0.03).

Treatment with SRS offers favorable rates of DAVF obliteration with low complication rates. Patients harboring DAVFs that are refractory or not amenable to endovascular or surgical therapy may be safely and effectively treated using SRS [1)].

Case series

The data from 165 consecutive patients diagnosed as CS-dAVF from January 2005 to September 2018 were analyzed. The demographic data included approaching route, embolization times, embolization material, the sequence of embolization, number of embolization sessions, and angiographic and clinical outcomes. Interrater agreement of bilateral CS-dAVF diagnosis was performed using the Kappa coefficient. The factors associated with treatment outcome were analyzed using Pearson's $\chi 2$ test.

Bilateral CS-dAVF was detected in 43 patients (26%). Angiographic presentations that showed evidence of sinus thrombosis, dangerous venous drainage, and higher Satomi classification were

more commonly found in bilateral CS-dAVF than in unilateral CS-dAVF. Good clinical outcome and cure from angiography were obtained in 90% and 74%, respectively. Ipsilateral inferior petrosal sinus-intercavernous sinus-contralateral CS catheterization was the major approach route of treatment. The factors associated with improved clinical outcome were transvenous approach, shunt closure, coil embolization, and sequencing the embolization ($P < 0.001$).

Dangerous venous drainage tends to increase in bilateral CS-dAVF. Retrograde ipsilateral inferior petrosal sinus catheterization using coil embolization and sequencing the embolization are the major concerns for treatment [2)]

1)
Chen CJ, Lee CC, Ding D, Starke RM, Chivukula S, Yen CP, Moosa S, Xu Z, Pan DH, Sheehan JP. Stereotactic radiosurgery for intracranial dural arteriovenous fistulas: a systematic review. J Neurosurg. 2015 Feb;122(2):353-62. doi: 10.3171/2014.10.JNS14871. Epub 2014 Dec 5. Review. PubMed PMID: 25479123.
2)
Churojana A, Sakarunchai I, Aurboonyawat T, Chankaew E, Withayasuk P, Sangpetngam B. Efficiency of endovascular therapy for bilateral cavernous sinus dural arteriovenous fistula. World Neurosurg. 2020 Oct 10:S1878-8750(20)32193-8. doi: 10.1016/j.wneu.2020.10.001. Epub ahead of print. PMID: 33049381.

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