

Cognard classification

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- [Dural Arteriovenous Fistula](#)

There are numerous [Dural arteriovenous fistula](#) classifications. [Borden](#) and [Cognard](#) are amongst the more widely used.

The [Cognard](#) classification of [dural arteriovenous fistulas](#) correlates venous drainage patterns with increasingly aggressive neurological clinical course. It was first described in [1995](#) ¹⁾.

Probably the most widely used classification system for [dural arteriovenous malformations](#).

Correlates venous drainage patterns with increasingly aggressive neurological clinical course.

Structure

The Cognard classification divides dural arteriovenous fistulas into 5 types according to the following features:

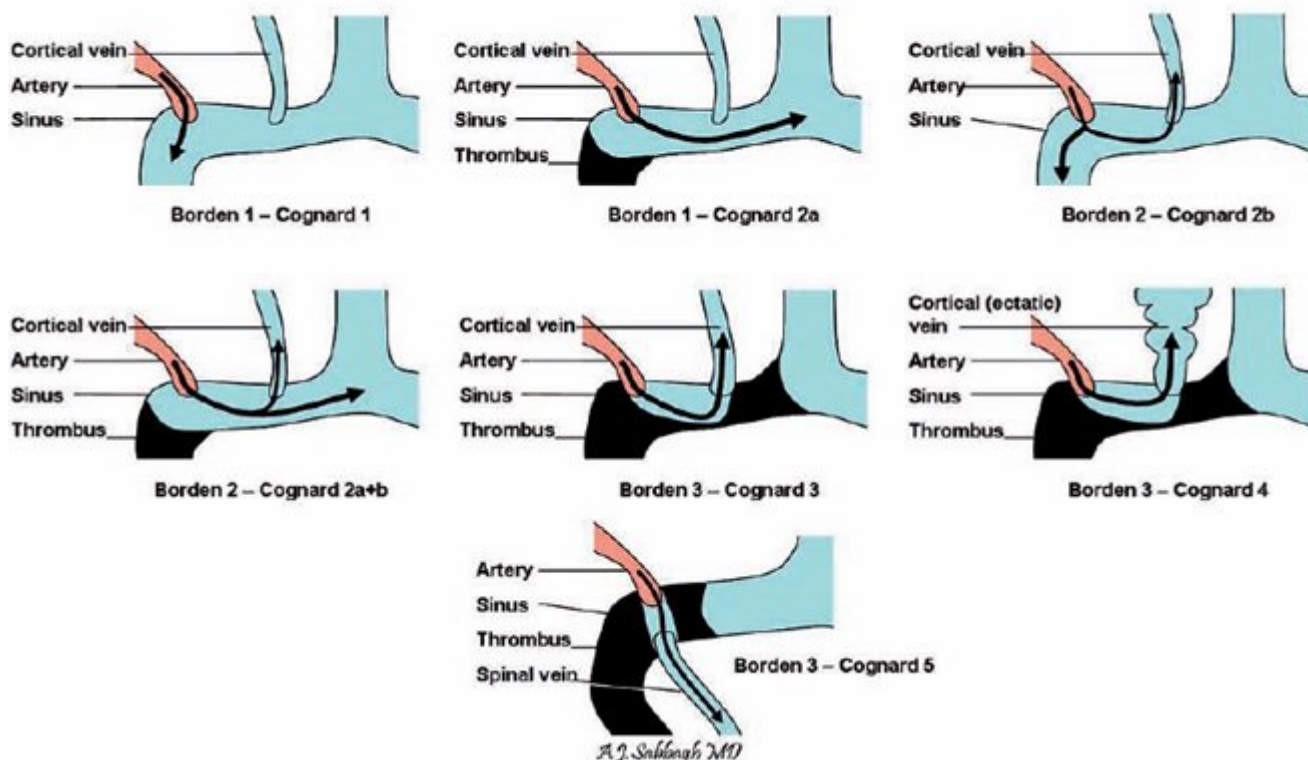
location of fistula

presence of cortical venous drainage

direction of flow

presence of venous ectasia

Dural Arteriovenous Fistula Classification



An alternative classification system is the Borden classification proposed in 1995, which although a little simpler (only 3 grades) does not capture differences which exist in terms of rate of haemorrhage reflected in the Cognard classification.^{2) 3)}

Type I - confined to **venous sinus** wall, typically after thrombosis.

Type II

Ila - confined to sinus with reflux (retrograde) into sinus but not cortical veins

Cognard Type IIb dural arteriovenous fistula

- [Venous Sinus Stenting Alone as an Effective Treatment for Complex Dural Arteriovenous Fistulas with Sinus Thrombosis](#)
- [Unexpected vasogenic oedema and alexia as complications after dural arteriovenous fistula embolization](#)
- [Subarachnoid Hemorrhage of Unknown Cause after Transvenous Embolization of Transverse Sigmoid Sinus Dural Arteriovenous Fistula Followed by Transarterial Embolization: A Case Report](#)
- [Contrast-Enhanced Magnetic Resonance Imaging Suggested a Possibility of Transvenous Embolization in the Superior Petrosal Sinus Dural Arteriovenous Fistula: A Case Report](#)
- [Role of Stereotactic Radiosurgery in the Management of Dural AV Fistula](#)
- [Clinical characteristics and outcome of dural arteriovenous fistulas secondary to cerebral venous sinus thrombosis: a primary or secondary event?](#)
- [A case report of a multi-arterial dural arteriovenous fistula](#)
- [Spontaneous resolution of nontraumatic bilateral Barrow Type D indirect carotid-cavernous fistulas: A case report](#)

Drains into **sinus** with reflux (retrograde) into cortical veins (10-20% haemorrhage)

Type III - drains direct into cortical veins (not into sinus) drainage (40% haemorrhage)

Type IV - drains direct into cortical veins (not into sinus) drainage with venous ectasia (65% haemorrhage)

Cognard Type V Dural Arteriovenous Fistula.

Outcome

In terms of prognosis, fistulas can be divided broadly into benign and aggressive lesions as follows:

benign = types I and IIa (lack of cortical venous drainage)

aggressive = everything else

annual risk of non-hemorrhage neurological deficit = 6.9%

annual risk of intracranial hemorrhage = 8.1%

combined annual mortality rate = 10.4% ⁴⁾.

¹⁾

Cognard C, Gobin YP, Pierot L, Bailly AL, Houdart E, Casasco A, Chiras J, Merland JJ. Cerebral dural arteriovenous fistulas: clinical and angiographic correlation with a revised classification of venous drainage. Radiology. 1995 Mar;194(3):671-80. PubMed PMID: 7862961.

²⁾

Intracranial Vascular Malformations and Aneurysms. Springer. (2008*) ISBN:354032920X.

³⁾

Davies MA, Ter Brugge K, Willinsky R et-al. The natural history and management of intracranial dural arteriovenous fistulae. Part 2: aggressive lesions. Interv Neuroradiol. 2012;3 (4): 303-11.

⁴⁾

Gandhi D, Chen J, Pearl M, Huang J, Gemmete JJ, Kathuria S. Intracranial dural arteriovenous fistulas: classification, imaging findings, and treatment. AJNR Am J Neuroradiol. 2012 Jun;33(6):1007-13. doi: 10.3174/ajnr.A2798. Epub 2012 Jan 12. Review. PubMed PMID: 22241393.

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