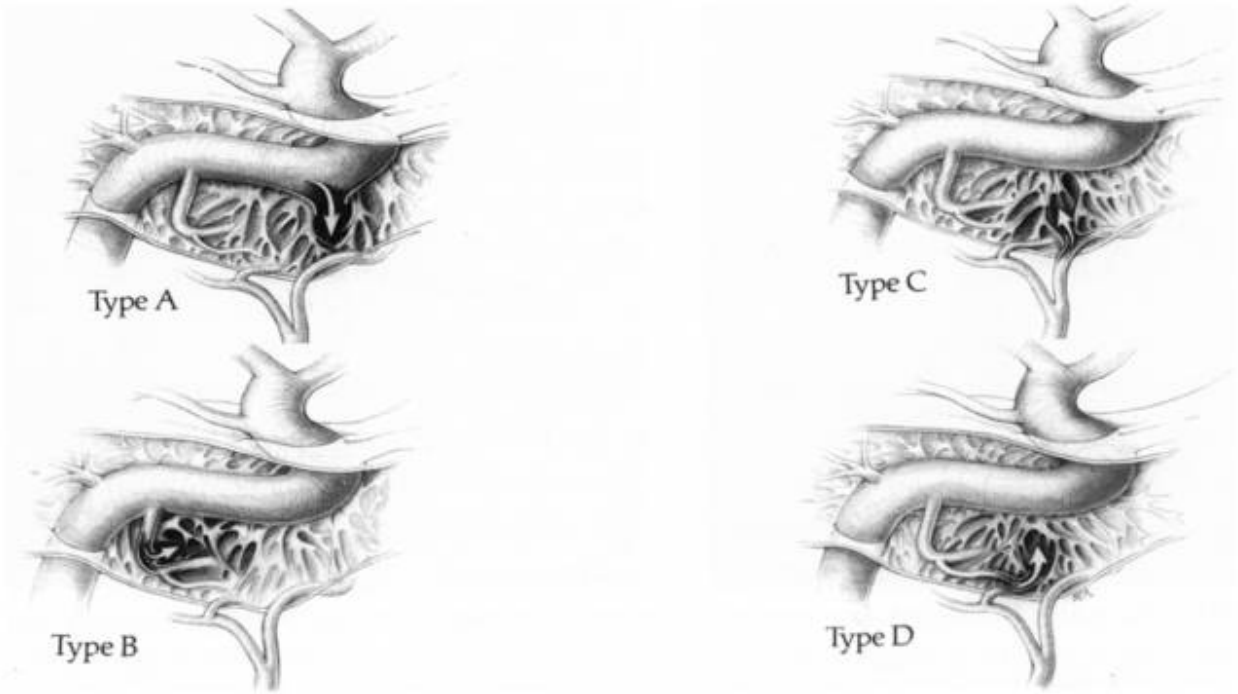
Barrow classification

Angioarchiecture of the arterial side of the fistula determines the Classification of spontaneous carotid cavernous fistulas after Barrow, the most widely adopted system to classify CCFs.

However, the Barrow classification is not very practical from clinical and therapeutic standpoints, as symptomatology and current treatment approach are influenced largely by venous drainage. In addition, most CCFs are indirect fistulae and fall under Barrow type D because there is always some supply from meningeal branches of both the ICA and external carotid artery [1].



Fistulas are divided into four types:

Type A are direct high-flow shunts between the internal carotid artery and the cavernous sinus;

Barrow Type B are dural shunts between meningeal branches of the internal carotid artery and the cavernous sinus

Type C are dural shunts between meningeal branches of the external carotid artery and the cavernous sinus;

Type D are dural shunts between meningeal branches of both the internal and external carotid arteries and the cavernous sinus [2].

Type A fistula develops either spontaneously or by rupture of an intracavernous ICA aneurysm. Indirect fistulas are also referred to as dural cavernous sinus fistulas (DCSFs) because they are supplied by dural branches of both, ECA and ICA.

The most frequent type is the Type D fistula (90%), often supplied by numerous branches from both territories, sometimes bilaterally.

This classification does not take into account cortical drainage nor does it differentiate between uni- and bilateral supplies or fistulas. Because of the increasing use of transvenous approaches for treatment of DCSF, Barrows classification is of less clinical significance today.

Type D fistulas, in the past usually considered “difficult to treat lesions“ (by transarterial embolization) can be as successfully occluded by transvenous approach as Type B or C fistulas. The latter although rare, were considered for long “easy to treat lesions“ because ECA feeders are easier to reach with a microcatheter.

1)
Thomas AJ, Chua M, Fusco M, Ogilvy CS, Tubbs RS, Harrigan MR, Griessenauer CJ. Proposal of Venous Drainage-Based Classification System for Carotid Cavernous Fistulae With Validity Assessment in a Multicenter Cohort. Neurosurgery. 2015 Sep;77(3):380-5. doi: 10.1227/NEU.0000000000000829. PubMed PMID: 26280824.
2)
Barrow DL, Spector RH, Braun IF, Landman JA, Tindall SC, Tindall GT. Classification and treatment of spontaneous carotid-cavernous sinus fistulas. J Neurosurg. 1985 Feb;62(2):248-56. PubMed PMID: 3968564.