Debrun Classification

Carotid-cavernous fistula (CCF): divided into direct (Type A) and indirect (Types B-D):

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

a) traumatic(including iatrogenic):occur in 0.2% of patients with craniocerebral trauma.

Iatrogenic: may follow percutaneous trigeminal rhizotomy, endovascular procedures...

b) spontaneous: usually due to ruptured cavernous sinus ICA aneurysm.May also occur in patients with connective tissue disorders

indirect (dural): most are shunts: from dural arteries that are branches of the external carotid (not from ICA) (exception: Type B) – low flow

a) Type B:from meningeal branches of the internal carotid artery(ICA)

b) Type C:from meningeal branches of the external carotid artery(ECA)

c) Type D: from meningeal branches of both the ICA and ECA

Classification of carotid cavernous fistulas (CCFs) into the four types described by Barrow allows the surgeon to choose the optimal therapy for each patient.

Type A patients have fast flow fistulas that are manifest by a direct connection between the internal carotid arterial siphon and the cavernous sinus through a single tear in the arterial wall. The best therapy is obliteration of the connection by a detachable balloon. Ninety-two of 95 traumatic CCFs were treated in this fashion. Direct surgical exposure of the cervical or cavernous internal carotid artery (ICA) was necessary in the remaining 3 patients, who had undergone unsuccessful surgical trapping. Three ruptured cavernous aneurysms and 2 spontaneous CCFs also had Type A connections. Other carotid-cavernous fistulas are slow flow, spontaneous dural arteriovenous malformations (AVMs) that have been classified into B, C, and D types on the basis of arterial supply. Occlusion of the ICA is not a logical choice in the treatment of dural AVMs that occur in the elderly, are relatively benign, and are often bilateral. Type B are rare and are fed by meningeal branches of the ICA only. We have not seen this type of dural fistula in our series.

Type C are supplied by feeders from the external carotid only and can almost always be obliterated successfully by embolizing the external carotid artery (ECA) branches. There are 4 Type C cases in this series of 37 spontaneous CCFs. All occurred in patients less than 30 years of age and were shunts between the middle meningeal artery and the cavernous sinus [1)].

1)
Debrun GM, Viñuela F, Fox AJ, Davis KR, Ahn HS. Indications for treatment and classification of 132 carotid-cavernous fistulas. Neurosurgery. 1988 Feb;22(2):285-9. PubMed PMID: 3352876.