

## Endovascular treatment for carotid-cavernous fistulae

Yuji Matsumaru MD, PhD

Division of Stroke prevention and treatment, Department of Neurosurgery,  
Faculty of Medicine, University of Tsukuba, Ibaraki, JAPAN

**Background:** Carotid-cavernous fistulae (CCF) is a single hole fistula between the internal carotid artery and cavernous sinus caused by head trauma or aneurysmal rupture. Detachable balloons were effective for this treatment but currently unavailable, then it is necessary to reconsider the treatment method. Transvenous coil embolization is not considered as a first-line treatment because of the need for a large number of coils, the uncertainty of occlusion, and the fear of recurrence leaving pseudoaneurysm.

**Results:** We retrospectively reviewed 13 cases of CCF experienced between 2007 and 2023. Three cases were iatrogenic related to catheter treatment, all of which were cured with conservative treatment. In 4 cases that developed during nasal surgery, 3 cases were cured by IC trapping and 1 case was cured by stent graft placement. There were 3 cases of aneurysm rupture, all of which were completely cured by aneurysm occlusion. In one case, rupture occurred after FD placement, so a coil was placed transvenously into the aneurysm. Two cases of confirmed Ehlers-Danlos Syndrome was treated with arterial and venous approaches, but one patient developed extensive cerebral infarction, and the other one suspected EDS patients was treated transvenously.

**Conclusion:** CCF can be completely cured with endovascular treatment, but the approach needs to be considered depending on its pathology.