

## Multiple cerebral aneurysm – case report

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### Abstract

This 41-years-old female presented with somnolence, confusion and nuchal rigidity. Preoperative angio-CT scan showed two aneurysm located on both internal carotid artery (ICA) at the site of posterior communicating artery (PComA). During surgery we discovered another dilatation on the origin of left ophtalmic artery that proves to be an infundibulum. We clipped the two communicating posterior aneurysm from the left side and the ophtalmic infundibulum was wrapped. Seven days after surgery the neurological status was improved and she was transferred to the Neurological department.

**Key words:** multiple cerebral aneurysm, subarachnoidian hemorrhage, internal carotid artery, posterior communicating artery.

### Introduction

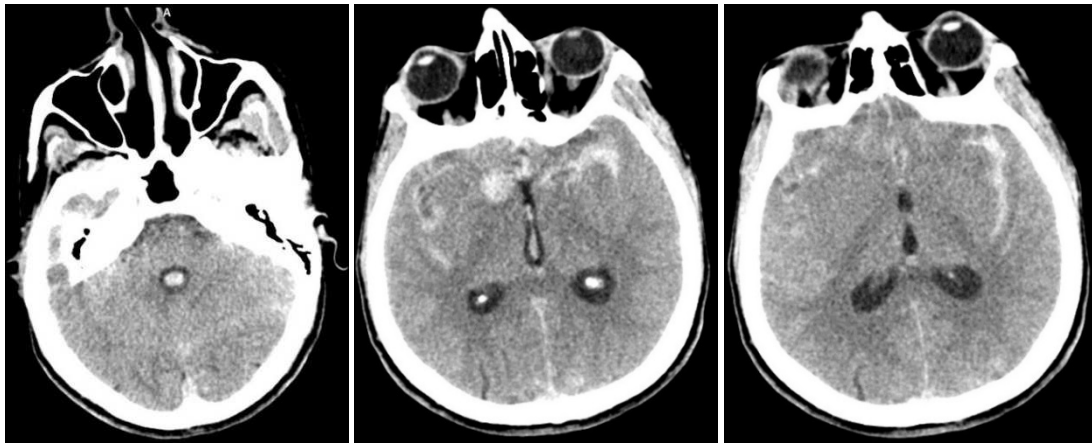
Aneurysms are acquired lesions and the rupture of this lesions lead to subarachnoid hemorrhage (3).

The incidence of multiple cerebral aneurysm is within 8% to 44% (5). The most

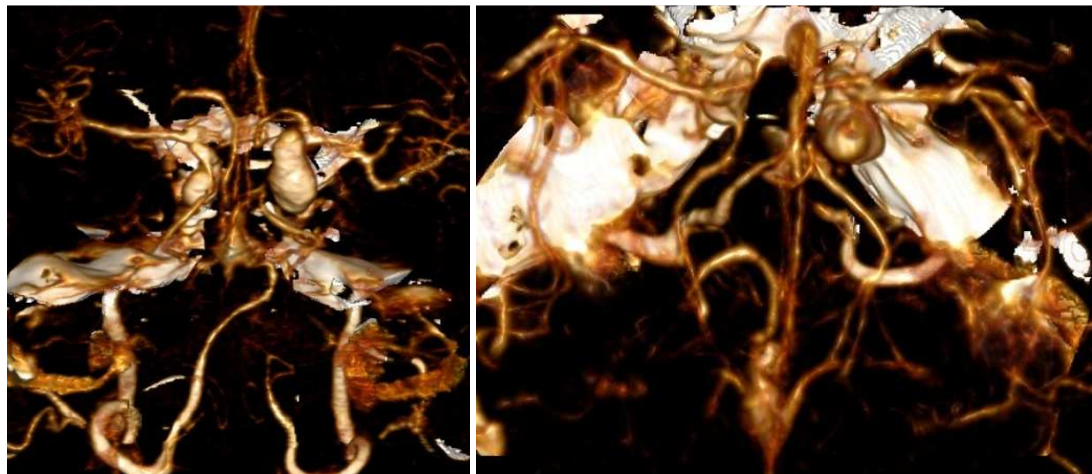
common localization site of multiple aneurysm are on the middle cerebral artery (MCA), ICA and on the anterior communicating artery (AComA) (4). In our series the most frequent combination was between AComA-MCA and AComA-PComA. In almost all cases the rupture occurred on ACoA aneurysm. A special group of multiple cerebral aneurysm are represented by the mirror-like aneurysm with an incidence between 5-36% (1).

Like in other studies, in our series too, the female represent the majority from the sex ratio point of view (2, 6, 7). The maximum incidence of aneurysmal rupture was reported in the fifth decade. The majority of multiple aneurysm were situated on the middle cerebral artery and the internal carotid artery (4).

Concerning the approach, we prefer to use unilateral approach for multiple cerebral aneurysm ("single stage – single opening"). This type of approach ("single stage – single opening") we perform after 3-4 days from the rupture because at that moment we will have a good brain relaxation, clinical and metabolically stability.



**Figure 1** - Preoperative CT scan. Intraventricular hemorrhage in the fourth and third ventricle. Subarachnoid hemorrhage in the basal cisterns and in the left Sylvian fissure. Fischer scale 4 grade



**Figure 2** - Preoperative angio-CT scan. Two aneurysm on the left and right ICA. The aneurysm on the left side is bigger than the opposite side aneurysm

### Case report

A 41-years-old female patient who was admitted in our Service from the Neurology department with a 24 hours history of headache, somnolence and focal motor seizures in the right superior limb. At the neurological examination the patient presented a GCS of 13 points, nuchal rigidity,

somnolence, confusion and she was without any motor deficits.

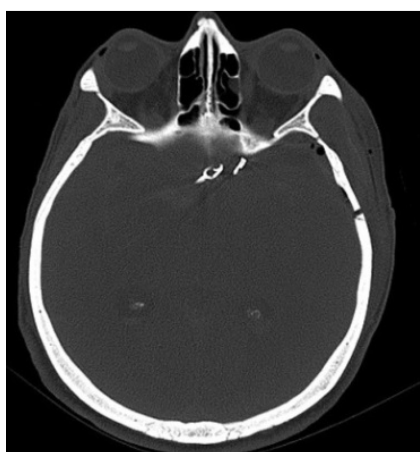
We performed a CT scan that show as subarachnoid hemorrhage in the basal cistern and in the left Sylvian fissure. The patient also presented intraventricular hemorrhage in the fourth and third ventricle (Figure 1).



**Figure 3** - Intraoperative image. Left ICA with the aneurysm situated on the ophthalmic segment and the posterior communicating artery aneurysm



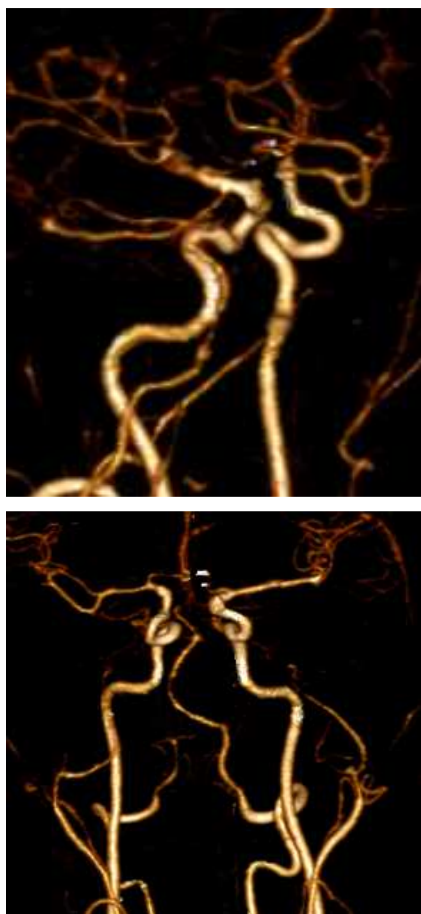
**Figure 4** - Postoperator CT scan



**Figure 5** - Postoperator CT scan – bone window. We performed a single opening

After that we performed an angio-CT and that showed two aneurysms on the left and right ICA at the site of PComA (Figure 2).

The operation was performed in the second day after admission. After the endotracheal induction of general anesthesia, the patient was placed in a supine position, with the head slightly raised and turned to the right side. A left frontotemporal craniotomy was the chosen approach. Dural opening was parallel with the skull base. After the dissection of the left Sylvian fissure, the left optic nerve and the supraclinoid segment of ICA we observed a dilatation on the ophthalmic part of ICA that proved to be an infundibulum (Figure 3). The left anterior clinoid process was resected intradurally in order to better define the neck of the aneurysm, than the definitive clip was placed on the left PcomA, along with wrapping of the left ophthalmic infundibulum. After the dissection of the arachnoid over the optic nerves and chiasm, the lamina terminallis was opened in order to have a better brain relaxation. The dissection was continued on the opposite side, above and beyond the contralateral optic nerve and ICA. The dissection of the aneurysmal neck was uneventful, and a curved definitive clip was placed on it, with a complete occlusion of the aneurysm. A standard wound closure with watertight duroplasty with autolog pericranium was performed. A follow-up CT –angio was performed at 48 hours postoperative period, demonstrating complete occlusion of the aneurysms with a normal caliber of both ICAs, with no additional brain lesions due to surgery (Figures 4, 5 and 6). The postoperative course was uneventful, with a progressive improvement of neurological status. After seven days of hospitalization the patient, at a GOS (Glasgow Outcome Score) of four was transferred to the Neurological department to continue the medical treatment.



**Figure 6** - Postoperator angio CT scan. We can see the vessels are permeable and there are no aneurysms left

## Discussion

When we have multiple aneurysms we prefer to delay surgery for 3-4 days to have a good brain relaxation and clinical and metabolically stability.

In multiple aneurysms we try to clip all aneurysms in a single stage, using the same unilateral approach. "Single stage single opening" is a good option for multiple aneurysms with paramedian location.

From our point of view we consider is better to make only one opening because is the less invasive technique to manage multiple aneurysms and in our series we had good results.

In our series the mortality of patients with H&H third grade was 10%. Also, in our series, 64% of patients with H&H third grade were discharged with a Glasgow outcome scale of 4 or 5.

## Acknowledgements:

The study was funded by POSDRU grant no. 159/1.5/S/138776 grant with title: "Model colaborativ instituțional pentru translatarea cercetării științifice biomedicale în practica clinică - TRANSCENT".

## References

1. Baccin CE, Krings T, Alvarez H, Ozanne A, Lasjaunas P: Multiple mirror-like intracranial aneurysms. Report of the case and review of the literature. *Acta Neurochir* 148: 1091-1096, 2006
2. Baumann F, Khan N, Yonekawa Y. Patient and aneurysm characteristics in multiple intracranial aneurysms. *Acta Neurochir Suppl.* 2008;103:19-28
3. Caranci F, Briganti F, Cirillo L, Leonardi M, Muto M. Epidemiology and genetics of intracranial aneurysms *Eur J Radiol.* 2013 Oct;82(10):1598-605.
4. Florian I Șt, Opțiuni terapeutice în accidentele vasculare cerebrale hemoragice. Editura medicală universitară "Tuliu-Hațieganu" Cluj-Napoca, 2007, pp. 300-303.
5. Heiskanen O, Porras M, Surgical management of unruptured cerebral aneurysms [chapter 80]; in Schmidek and Sweet: Operative neurosurgical techniques – Indications, methods and results, Fourth edition, WB Saunders Company, 2000.
6. Inagawa T. Incidence and risk factors for multiple intracranial saccular aneurysms in patients with subarachnoid hemorrhage in Izumo City, Japan. *Acta Neurochir (Wien).* 2009 Dec;151(12):1623-30.
7. Lai HP, Cheng KM, Yu SC, Au Yeung KM, Cheung YL, Chan CM, Poon WS, Lui WM. Size, location, and multiplicity of ruptured intracranial aneurysms in the Hong Kong Chinese population with subarachnoid hemorrhage. *Hong Kong Med J.* 2009 Aug;15(4):262-6.