Spontaneous disappearance of an intracranial aneurysm:

A systematic review of recent 10-years cases and a case of small middle cerebral artery saccular mirror aneurysms added.

• Purpose

- Spontaneous disappearance of intracranial aneurysms have been reported previously
- Due to the rarity, there has been difficulty in discussing the pathophysiology.
- This study aims to investigate the possible mechanism of the disappearance.

• Method

- A search of PubMed was conducted for recent 10-years articles about the spontaneous disappearance of intracranial aneurysms.
- The patient's demographics, characteristics of the aneurysms (whether ruptured or unruptured, location, size, shape), time of the disappearance were identified.
- In addition, we introduce our case of small middle cerebral artery saccular mirror aneurysms

- Results

- From a total 109 articles identified from the search, 11 articles were chosen for the analysis.
- Total 12 cases showed the spontaneous disappearance of the aneurysm
- The unruptured group tended to be bigger in their sizes than the ruptured group, as the average of the largest diameters in each group was 4.02 mm vs 2.7mm
- The unruptured group took more time to be disappeared as average 9.05 years vs 0.25 years.
- During the period of observation, 3 cases represented recurrence of the aneurysm.

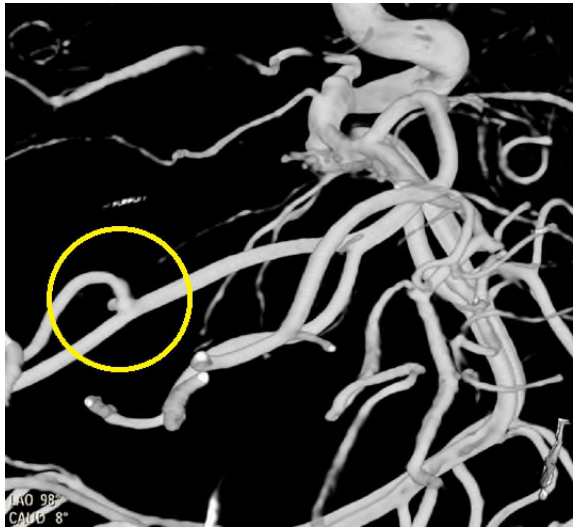
Author	Age	Sex	Comorbidity	Rupture	Location	Size	Shape	Time of disappearance	Spasm	Recurrence
Qiaowei Wu et al., 2022	40	F	N	N	Lt. VA	4.5 mm	Fusiform	3 months	N	N
Yokoya S et. al., 2019	53	F	HTN, DM	N	Lt. distal ICA	4.08 mm	Saccular	12 years	N	N
Akimoto Y et al., 2020	64	F	N	N	ACA	4.9 mm	Saccular	5 years	N	Y (2years)
Akimoto Y et al., 2020	57	F	N	N	Rt. MCA	2.4 mm	Saccular	13 years	N	N
Begley SL et. al., 2023	65	F	HTN	N	Lt. PCA	4.2 mm	Saccular	15 years	N	Y (1 month)
Yamada H et. al., 2019	29	M	MMD, UC	Y	Rt. Distal ICA	4 mm	Saccular	25 days	N	N
Wu Y et. al., 2022	65	M	HTN, DM	Y	Basilar artery	1.5 mm	Saccular	2 months	N	N
Peruvumba JN et. al., 2016	23	F	N	Y	ACA	2 mm	Saccular	9 months	N	N
Wei D et. al,. 2014	36	F	N	Y	Lt. PCA	2 mm	Saccular	4 weaks	N	Y (10 weeks)
Chen H, et. al,. 2019	39	F	MMD, HTN	Y	Rt. PCA	3.7 mm	Fusiform	44 days	N	N
Su TM et. al., 2014	7m	M	N	Y	Rt. PICA	NA	Fusiform	3 months	N	N
Nakazaki A et. al., 2021	45	F	FMF	Y	Rt. LSA	3 mm	Fusiform	105 days	N	N

FMF ; Familial Mediterranean fever, LSA ; Lenticulostriate artery

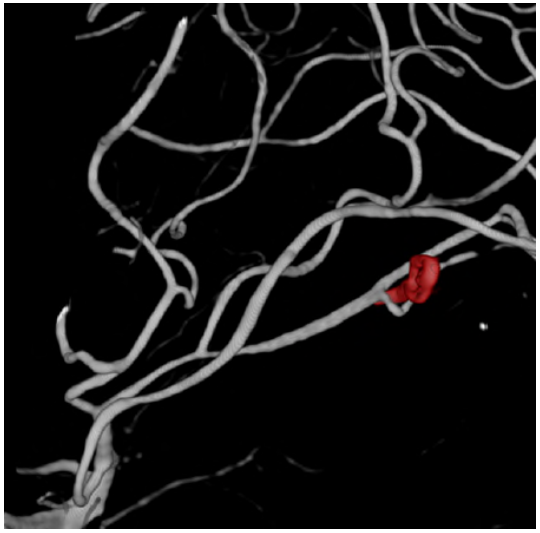
- Discussions

- We introduce a 53-year-old female patient without underlying disease, presenting with subarachnoid hemorrhage (SAH) due to ruptured 2mm sized saccular aneurysm at left middle cerebral artery (MCA).
- She had another unruptured 2mm sized saccular mirror aneurysm at the right MCA.
- She underwent the clip surgery for the ruptured one which showed intra-operative bleeding with its shape preserved.
- The digital subtraction angiography (DSA) which was performed on the 6th postoperative day showed complete clipping of the left side aneurysm. At that time, the contralateral mirror aneurysm was spontaneously disappeared which was not even exposed during the surgery.
- The follow-up DSA on the 12 weeks after the surgery represented that the mirror aneurysm on the right MCA still remain disappeared.

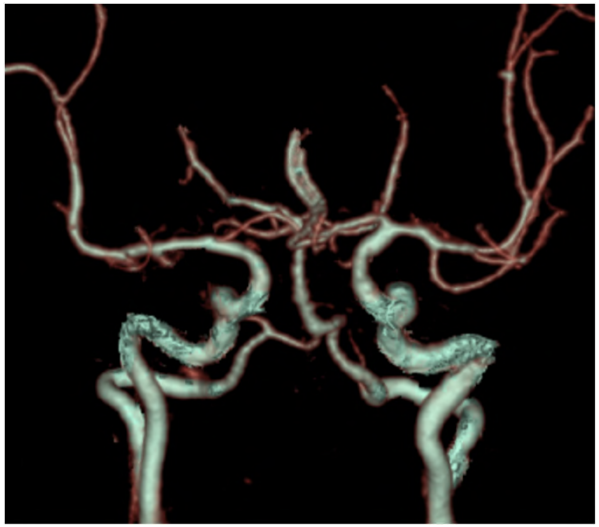
Initial CT



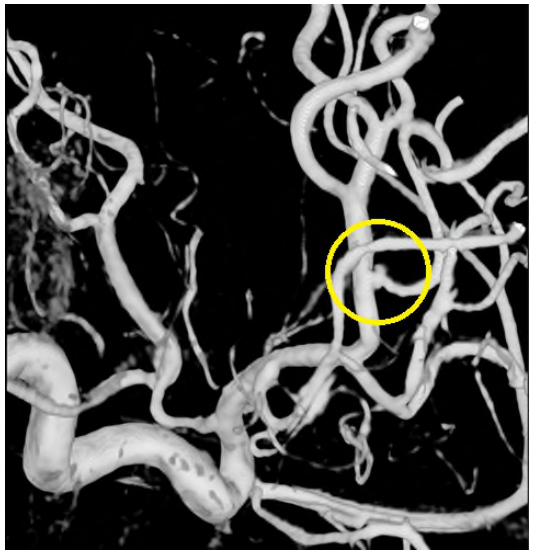
Initial DSA (Lt. MCA)



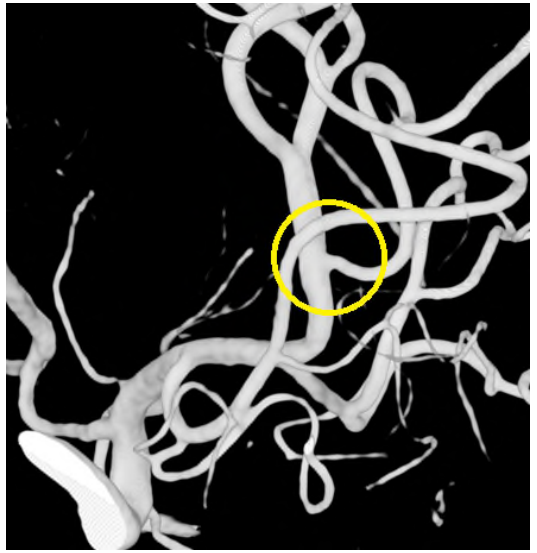
POD#6 DSA (Lt. MCA)



Initial CT angiography



Initial DSA (Rt. MCA)



POD#6 DSA (Rt. MCA)

• Discussions

- In case of our patient with mirror aneurysms, the ruptured one was 2.5mm saccular aneurysm at left M2-3 junction which showed intra-operative bleeding with its shape preserved.
- The unruptured one was 2mm saccular aneurysm at the right M2-3 junction which disappeared just in 12 days.
- Comparing the previous tendency and our patient, the discrepancy was found in the aspect of the size and shape of the aneurysm, the time required for the disappearance.

• Conclusions

- The spontaneous disappearance of intracranial aneurysm is unusual and its mechanism remains incompletely understood.
- Some of the disappeared aneurysms may recur, hence the recommendation for the thorough angiographic observation