

Intracranial aneurysm case series

2023

Guo et al. performed a [retrospective review](#) of young patients (15-24 years old) with [intracranial aneurysms](#) examined in the Fifth Ward of the Neurosurgery Department of Tianjin Huanhu Hospital between January 2015 and November 2022. Data were reviewed for age, sex, presentation, type and size, treatment modalities, location, postoperative complications, and clinical and imaging outcomes. Among the 23 patients, there were 11 males and 12 females (1:1.09). Their presentations included headache, neurological deficits, aneurysmal subarachnoid hemorrhage, incidental or asymptomatic aneurysm, and traumatic subarachnoid hemorrhage. Twenty-five cases of intracranial aneurysms in 25 patients were identified. The aneurysms were saccular (32%, 8/25), dissecting (52%, 13/25), and fusiform (16%, 4/25) in shape. Treatment modalities included direct clipping, embolization, bypass, trapping, resection, coarctation of the internal carotid artery (ICA), and endovascular vessel sacrifice. Of the 25 aneurysms, 16 (64%, 16/25) aneurysms were located in the [anterior circulation](#), and 9 (36%, 9/25) were located in the posterior circulation, while multiple aneurysms were identified in two patients. A preoperative magnetic resonance perfusion (MRP) examination was performed in 15 patients with unruptured complex aneurysms, of whom 13/15 (86.67%) showed hypoperfusion. Eighteen (78.26%, 18/23) patients had no postoperative complications, temporary complications occurred in 4 (17.39%, 4/23) patients, and 1 patient died postoperatively. Intracranial aneurysms in young adults (15 ~ 24 years old) are rare. The [posterior circulation](#) is more commonly involved than adults, giant and huge aneurysms are frequent, and fusiform and dissecting pathologic features are common. [Headache](#) is the most common clinical manifestation. Individualized treatment should be performed, and [bypass](#) is an effective treatment for young patients with [intracranial aneurysms](#) ¹⁾.

During the 5-year period, 415 patients with intracranial aneurysm. Patients with [Poor-grade aneurysmal subarachnoid hemorrhage](#) accounted 31.08% (n = 132) of the total number of [ruptured aneurysms](#). Interventional treatment was predominantly in the form of surgery, whereas [conservative treatment](#) included [medication](#) and [external ventricular drainage](#). Final [outcome](#) was assessed with [amodified Rankin score](#) (mRs). Statistical analysis was performed using [SPSS](#) version 23.0 with a significance level set to 5% ($\alpha = 0.05$). Results The majority of patients (57.6%) were in the age range from 51 to 69 years. Twenty-five patients (18.9%) had an HH score of 4, whereas 107 patients (81.1%) had an HH score of 5. Depending on the [location](#), the majority of patients (n = 43) had an aneurysm on the medial cerebral artery (MCA). The final aneurysm occlusion was performed in 71 patients, of whom 94.36% were treated surgically. A positive outcome (mRs 0-4) was found in 49.25% of patients who underwent primarily surgical, treatment with a mortality of 42.3%. Although the outcome was better in patients with an HH score 4, both groups benefited from surgical treatment. Conclusion Poor-grade aneurysmal SAH is a condition of the middle and older age, with most patients with an HH 5 score and deep comatose state. There was better outcome in patients with an HH score of 4 compared to an HH score of 5 and both groups benefited from surgical treatment, which resulted in a positive outcome in almost 50% of surgically treated patients ²⁾

176 patients with IA recruited in the Service of Neurosurgery at the University Hospital of [Valladolid](#) (Spain) and a control group of 150 sex-matched healthy subjects. Clinical variables were collected

from each patient. We have analyzed VEGFA rs833061, VEGFR2 rs2071559, endothelin rs5370, endoglin rs3739817, and eNOS rs1799983 polymorphisms.

Results: Our results showed that allele T of the eNOS rs1799983 polymorphism is correlated with decreased risk of developing the disease; thus, allele G of the eNOS rs1799983 polymorphism increased the risk of developing IA.

Conclusion: The association of eNOS rs1799983 polymorphism with the risk to suffer IA reinforces the hypothesis that genetic variants in eNOS gene could be crucial in the pathogenesis of IA ³⁾

2022

In the [Cangzhou Central Hospital](#), a total of 144 patients with [intracranial aneurysms](#) were enrolled as the test subjects, who were randomly and evenly divided into the Intracranial Clipping group and the Interventional Embolization group. Cognitive and neurologic functions were evaluated by the Glasgow Outcome Scale, Montreal Cognitive Assessment (MoCA), Mini-Mental State Examination ([MMSE](#)) scales, and National Institutes of Health Stroke Scale ([NIHSS](#)) and [Activities of Daily Living](#) (ADL) scale. Enzyme-linked immunosorbent assay was used to analyze the serum levels of neuron-specific enolase ([NSE](#)) and S100 β .

There were no significant differences in the preoperative MMSE, MoCA, NIHSS, or ADL scale between the two groups ($p > 0.05$). However, after the operation, the MMSE and MoCA scores of the interventional embolization group were significantly higher, whereas the NIHSS and ADL scales were significantly lower than those of the intracranial clipping group ($p < 0.05$). The levels of NSE and S100 β in the intracranial clipping group were significantly higher than in the interventional embolization group.

[Intracranial aneurysm embolization](#) exerts better effects on [cognitive](#) and neurologic functions than [intracranial aneurysm clipping](#) ⁴⁾.

over the past 20 years, a total of 2032 aneurysms were treated. In 1263 [endovascularly](#) managed aneurysms the regrowth or incomplete initial occlusion necessitated 159 repeated procedures (12.6%). In the surgical group, a total of 27 aneurysms needed retreatment (3.5%). The difference is statistically significant. In nine patients in the endovascular group, the rebleeding was the reason for repeated procedures. No rebleeding was seen in the surgical group. This fact, also shown in the review part of the article, is important in patient counseling. Given the similar clinical results of both modalities, the patient should be advised on the necessity of repeated follow-ups and of possible technical failure and eventually repeated procedure which is more likely if an endovascular procedure is chosen ⁵⁾.

2019

compared two groups of patients (non-elderly, < 65 years; elderly, ≥ 65 years) who underwent surgical clipping or endovascular coiling and were registered in a nationwide database in Japan from 2010 through 2015. The odds ratio (OR) and 95% confidence interval (CI) of each risk factor were

calculated through multivariate logistic regression analysis for poor outcome according to a modified Rankin Scale (mRS) score >2 at discharge for each group.

In all groups, the risk factors for poor outcome were older age, male sex, neurological grade on admission, diabetes mellitus, and use of anticoagulation drugs. Inverse risk factors were a high-volume hospital, academic hospital, hypertension, and use of an antiplatelet drug (OR 0.63-0.81: 95%CI 0.56-0.88). Chronic heart disease was also a risk factor, but use of a statin drug (0.85-0.87: 0.76-0.97) and location on the anterior communicating artery (0.74-0.80: 0.67-0.91) were inverse risks in both elderly and endovascular coiling groups.

Management for patients with aSAH was recommended in high-volume and academic institutes with the administration of antiplatelet drugs and consideration of several risk factors. Elderly patients undergoing endovascular coiling might be better given a statin drug, and patients with chronic heart failure or an anterior communicating artery aneurysm should be better treated more carefully ⁶⁾.

In a retrospective review, Yeon et al. examined 299 patients with 339 aneurysms, all shown to be completely occluded at 36 months on follow-up images obtained between 2011 and 2013. [Medical records](#) and radiological [data](#) acquired during the extended [monitoring](#) period (mean 74.3 ± 22.5 months) were retrieved, and the authors analyzed the incidence of (including mean annual risk) and risk factors for delayed [recanalization](#).

A total of 5 coiled aneurysms (1.5%) occluded completely at 36 months showed recanalization (0.46% per aneurysm-year) during the long-term surveillance period (1081.9 aneurysm-years), 2 surfacing within 60 months and 3 developing thereafter. Four showed minor recanalization, with only one instance of major recanalization. The latter involved the posterior communicating artery as an apparent de novo lesion, arising at the neck of a firmly coiled sac, and was unrelated to coil compaction or growth. Additional embolization was undertaken. In a multivariate analysis, a second embolization for a recurrent aneurysm (HR = 22.088, p = 0.003) independently correlated with delayed recanalization.

Almost all [coiled](#) aneurysms (98.5%) showing complete [occlusion](#) at 36 months postembolization proved to be stable during extended observation. However, [recurrent aneurysms](#) were predisposed to delayed [recanalization](#). Given the low [probability](#) yet seriousness of delayed recanalization and the possibility of [de novo aneurysm](#) formation, careful monitoring may be still considered in this setting but at less frequent intervals beyond 36 months ⁷⁾.

Of 818 patients undergoing Microsurgical [Clipping](#) of [Intracranial Aneurysms](#) who underwent [cranial operations](#), 28 (3.4%) had a [ventriculoperitoneal shunt](#). Four of these 28 (14.3%, 95% [confidence interval](#) [CI] 4.0%-32.7%) developed [postoperative complications](#), compared to 42 of 790 (5.3%, 95% CI 4.0%-7.1%) without a history of VP shunt (P = .07). In addition, patients with a [shunt](#) were more likely to have longer cranial [procedures](#) (P = .04), longer [hospital stays](#) (P = .05), and more [computed tomography](#) scans during their craniotomy-associated admission (P = .002). [Multivariate](#) analysis, though not significant, demonstrated that the presence of a shunt contributed to the development of complications ([odds ratio](#) [OR] 2.24, 95% CI .70-7.13, P = .17). Length of surgery (OR 1.17, 95% CI 1.04-1.31, P = .01) and [length of stay](#) (OR 1.04, 95% CI 1.01-1.07, P = .01) were significantly longer in those with a postoperative complication.

Linzey et al. from [Ann Arbor](#), found a nonsignificant trend toward increased postoperative

complications in patients with a VP shunt who underwent a subsequent cranial operation ⁸⁾.

A total of 53 patients from a single institution who initially presented with a subarachnoid hemorrhage and underwent surgical clipping of a previously coiled intracranial aneurysm between December 1997 and December 2014 were studied. Clinical features, hospital course, and preoperative and most recent functional status (Glasgow Outcome Scale score) were reviewed retrospectively.

The mean time interval from coiling to clipping was 2.6 years, and mean follow-up was 5.5 years (range, 0.1-14.7 years). Five patients (9.8%) presented with rebleed prior to clipping. Most patients (79.3%, 42/53) experienced good neurologic outcomes. Most showed no change (81%, 43/53) or improvement (13%, 7/53) in functional status after microsurgical clipping. One patient (2%) deteriorated clinically, and there were 2 mortalities (4%).

Microsurgical clipping of previously ruptured, coiled aneurysms is a promising treatment method with favorable clinical outcomes ⁹⁾.

2018

A total of 53 patients from Phoenix and San Francisco, who initially presented with a subarachnoid hemorrhage and underwent surgical clipping of a previously coiled intracranial aneurysm between December 1997 and December 2014 were studied. Clinical features, hospital course, and preoperative and most recent functional status (Glasgow Outcome Scale score) were reviewed retrospectively.

The mean time interval from coiling to clipping was 2.6 years, and mean follow-up was 5.5 years (range, 0.1-14.7 years). Five patients (9.8%) presented with rebleed prior to clipping. Most patients (79.3%, 42/53) experienced good neurologic outcomes. Most showed no change (81%, 43/53) or improvement (13%, 7/53) in functional status after microsurgical clipping. One patient (2%) deteriorated clinically, and there were 2 mortalities (4%).

Microsurgical clipping of previously ruptured, coiled aneurysms is a promising treatment method with favorable clinical outcomes ¹⁰⁾.

Retrospective review of the medical records of 320 patients with 416 aneurysms treated with microsurgical clipping from 2008 to 2016 in a single neurosurgical center in Brazil. This study evaluated postoperative outcome, using the modified Rankin Scale (mRS) on hospital discharge, treatment efficacy, assessed by digital subtraction angiography (DSA) performed postoperatively, and mortality.

Among 320 patients with aneurysms, 228 patients presented with ruptured aneurysms and 92 patients with unruptured aneurysms. Overall, 81 (26,3%) presented poor outcome (mRs>2) while 227 (73,4%) showed good outcome. The presence of a ruptured aneurysm was a statistically significant factor for poor outcome ($p<0,001$) and mortality ($p<0,015$). Giant and large aneurysms were also associated with poor outcome ($p=0,004$). When we analyze separately, unruptured aneurysms with poor outcome were only associated with aneurysms size. Among the patients with ruptured

aneurysms, those with Hunt Hess (HH) > 2 on hospital admission showed unfavorable outcomes ($p < 0,0001$). Among patients submitted to postoperative DSA, 207 (89,8%) had complete occlusion of the aneurysms and 24 (10,2%) presented residual aneurysms, with reoperation required in eight cases.

Microsurgical treatment of intracranial aneurysms is an effective and safe method ¹¹⁾.

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Guo W, Wang H, Shang Y, Shi M, Wang X, Wang X, Bao J, Wang Z, Tong X. Clinical characteristics and individualized treatment of intracranial aneurysms in young adults: a single-center experience. *Neurosurg Rev*. 2023 May 16;46(1):122. doi: 10.1007/s10143-023-02025-0. PMID: 37191817.

2)

Ahmetspahić A, Janković D, Burazerovic E, Rovčanin B, Šahbaz A, Hasanagić E, Džurlić A, Granov N, Feletti A. Clinical Characteristics of Poor-Grade Aneurysmal Subarachnoid Hemorrhage Treatment. *Asian J Neurosurg*. 2023 Mar 27;18(1):132-138. doi: 10.1055/s-0043-1764118. PMID: 37056885; PMCID: PMC10089758.

3)

Usategui-Martín R, Jiménez-Arribas P, Sakas-Gandullo C, González-Sarmiento R, Rodríguez-Arias CA. Endothelial nitric oxide synthase rs1799983 gene polymorphism is associated with the risk of developing intracranial aneurysm. *Acta Neurochir (Wien)*. 2023 Mar 18. doi: 10.1007/s00701-023-05552-3. Epub ahead of print. PMID: 36932233.

4)

Gao P, Jin Z, Wang P, Zhang X. Effects of [Intracranial](#) Interventional [Embolization](#) and Intracranial [Clipping](#) on the [Cognitive](#) and Neurologic Function of Patients with [Intracranial Aneurysms](#). *Arch Clin Neuropsychol*. 2022 May 22;acac030. doi: 10.1093/arclin/acac030. Epub ahead of print. PMID: 35596958.

5)

Beneš V, Štekláčová A, Bradáč O. Repeated Aneurysm Intervention. *Adv Tech Stand Neurosurg*. 2022;44:277-296. doi: 10.1007/978-3-030-87649-4_16. PMID: 35107686.

6)

Ikawa F, Michihata N, Iihara K, Akiyama Y, Morita A, Fushimi K, Yasunaga H, Kurisu K. Risk management of aneurysmal subarachnoid hemorrhage by age and treatment method from a nationwide database in Japan. *World Neurosurg*. 2019 Sep 12. pii: S1878-8750(19)32445-3. doi: 10.1016/j.wneu.2019.09.015. [Epub ahead of print] PubMed PMID: 31521760.

7)

Yeon EK, Cho YD, Yoo DH, Lee SH, Kang HS, Kim JE, Cho WS, Choi HH, Han MH. Is 3 years adequate for tracking completely occluded coiled aneurysms? *J Neurosurg*. 2019 Aug 16:1-7. doi: 10.3171/2019.5.JNS183651. [Epub ahead of print] PubMed PMID: 31419789.

8)

Linzey JR, Wilkinson DA, Nadel JL, Thompson BG, Pandey AS. Complications in Patients Undergoing Microsurgical Clipping of Intracranial Aneurysms with Pre-existing Ventriculoperitoneal Shunts Following a Cranial Procedure. *J Stroke Cerebrovasc Dis*. 2018 Dec 20. pii: S1052-3057(18)30686-4. doi: 10.1016/j.jstrokecerebrovasdis.2018.11.034. [Epub ahead of print] PubMed PMID: 30579731.

9) 10)

Nisson PL, Meybodi AT, Roussas A, James W, Berger GK, Benet A, Lawton MT. Surgical Clipping of Previously Ruptured, Coiled Aneurysms: Outcome Assessment in 53 Patients. *World Neurosurg*. 2018 Dec;120:e203-e211. doi: 10.1016/j.wneu.2018.07.293. Epub 2018 Aug 23. PubMed PMID: 30144619.

11)

Dellaretti M, Ronconi D, Batista DM, de Souza RF, de Almeida CER, Fontoura RR, Botelho Antunes PR, Quadros RS. Safety and Efficacy of Surgical Treatment of Intracranial Aneurysms: The Experience of a Single Brazilian Center. *World Neurosurg*. 2018 Jun 20. pii: S1878-8750(18)31307-X. doi: 10.1016/j.wneu.2018.06.091. [Epub ahead of print] PubMed PMID: 29935315.

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