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Arteriovenous Malformation Rupture on Posterior Cranial Fossa: Management and Treatment of 9 Children Patients at Morozovskaya Children's Hospital

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ABSTRACT

Introduction: Posterior cranial fossa (PCF) arteriovenous malformations (AVM) in children are the least studied among vascular malformations. Mortality rates after hemorrhages from ruptured PCF AVM reach the range of up to 21-67%. The aim of this Evaluation of the treatment tactics of the arteriovenous malformation rupture in an area of the posterior cranial fossa in children.

Materials and Methods: The study includes 9 children admitted to the Morozovskaya Children's City Clinical Hospital Moscow Healthcare department, Moscow, Russia, with PCF, AVM intracranial hemorrhage (ICH) during the period of 2015-2022. The age varies from 7 to 17 years old. All patients underwent clinical and neurological examination, CT, and MRI of the brain, as well as cerebral angiography. The volume of intracranial hematoma ranges from 5 to 41.1 mL. To decide on the further extent of surgical intervention, GCS, Greab, PedNIHSS, and H-H scales were used.

Results: The extent of surgical intervention was based on the time of the admission to the hospital, the severity of the patients' condition, the size and location of the ICH, and its relationship to the med-stem structures. Type of operation: microsurgical intervention in 3 cases (33.3 %), endovascular embolization in 2 cases (22.2 %), combined treatment in 4 cases (44.5 %). Surgery was performed in the acute period in all patients.

Conclusion: Modern microsurgical and endovascular PCF AVM treatment methods allow for positive results in complete neurological symptom regression form. This considerably decreases disability rates and increases patients' quality of life.

Keywords: Arteriovenous malformation, microsurgical approach of AVM, evacuation on intracranial hematoma, hemorrhagic stroke.

1. Introduction

Cerebral arteriovenous malformations (AVM) are abnormal vascular connections that occur in the brain at the rate of approximately 10-18 cases per 100,000 people. AVMs may remain asymptomatic for many years, but they often result in spontaneous ruptures in children. severe consequences, such as brain tissue damage, long-term disability, and in the worst cases—death.[1] Spontaneous intracranial hemorrhage (SIH) in cerebral arteriovenous malformations occurs at a rate of 2–4% per year when surgical intervention is declined. This risk is significantly reduced after proper treatment.

There is a significant risk of AVM rupture without treatment, as it can lead to serious neurological complications and life-threatening conditions. Therefore, monitoring, risk assessment, and, if necessary, surgical intervention are important aspects of managing patients with ruptured cerebral AVMs in the PCF region in children.[2]

Posterior cranial fossa AVMs account for only 7–15% of all brain AVMs, compared to supratentorial AVM localization. There is speculation that posterior cranial fossa AVMs are "silent AVMs," and those will not be identified until the rupture event. Hemorrhagic manifestations of posterior cranial fossa AVMs pose an increased risk of disability and death. Patients with posterior cranial fossa AVM had a poor prognosis with a mortality rate of 21.0%-66.7% after initial bleeding.[3] However, relevant literature does not indicate which subgroup (cerebellar or brainstem AVM) contributes more to high hemorrhagic mortality. Predictors of severe outcomes after initial bleeding are rarely described, and only a few cases have described the clinical picture in children.[4]

Due to the development of neuroimaging methods, there has been an increase in the number of cases of the disease detected in children and adolescents. Modern technologies allow for more accurate and timely diagnosis of the pathology, which contributes to improving the quality of treatment and increases the likelihood of a positive outcome.[5]

In this retrospective study, we summarized the experience of inpatient surgical treatment of hemorrhagic stroke due to ruptured arteriovenous malformation in the posterior cranial fossa. For this purpose, the case histories of emergency surgical patients with ruptured cerebral AVM in the acute phase were analyzed, and a relationship between AVM rupture and clinical outcome was established.

2. Materials and Methods

The study is a single-center retrospective over treatment, outcome, and approaches that analyzes the children with intracranial hematomas (ICH) that formed after rupture of an AVM of the brain in the posterior cranial fossa (PCF). The study includes children with PCF AVM. There were 9 patients who met the inclusion criteria, of whom 33% were boys and 67% were girls, undergoing inpatient treatment at the State Budgetary Healthcare Institution "Morozovskaya City Clinical Hospital of the Health Department of the Moscow Region" during the period of 2015-2022. The inclusion criteria for children to be included Age under 18 years, intracerebral hematoma presence, verified PCF AVM, confirmed by diagnostic means of direct angiography, computed tomography angiography (CT-angiography) or magnetic resonance angiography (MR-angiography). Exclusion criteria are as follows:AVM localization within the supratentorial area, Galen vein AVM.

All patients underwent a clinical neurological examination, which included patient demographic data (gender, age) and a detailed symptomatic picture (headaches, seizures, neurological deficit). Modified GCS and Hunt–Hess (H–H) scores were calculated retrospectively for all patients at admission. Spetzler–Martin (S–M) scores were calculated after cerebral angiography (CAG) before intervention. The percentage of hematoma volume to total brain volume ratio and AVM lateralization were assessed.

3. Results

Headache, nausea, and vomiting were the main symptoms for 6 (66.6%) of the 9 children, while focal neurological deficiency was the main complaint for 3 (33.4%) of the 9 children (Table No. 1). Based on the Spetzler-Martin scale gradation, Table 2 lists AVM therapy strategies for kids. The cerebral hematoma's volume at admission was between 5 and 41.1 mL, based on CT and MRI data. The information was gathered using the Brain Lab technology. Intracerebral hemorrhage accounted for 55.6% of the cases, followed by intraventricular hemorrhage (11.1%) and mixed hemorrhage (33.3%).

The GCS examination revealed that most patients with coma (44.5%), stupor (11.1%), obtundation (11.1%), and clear consciousness (33.3%) were sent straight to the critical care unit, skipping the admissions and neurosurgery departments.

Table 1. PFC AVM treatment methods based on clinical course (first symptoms)

Treatment method	Headaches/ nausea and vomiting	Focal neurological deficit	Total
Microsurgery	2	1	3
Embolization	1	-	1
Combined intervention (microsurgery+embolization)	3	2	5
Total	6	3	9

Table 2. Spetzler-Martin Scale gradation-based PFC AVM therapy techniques

	Spetzler–Martin Scale AVM Type		
Treatment method	**II**	**III**	**IV**
Microsurgery	1	2	0
Embolization	0	0	1
Combined intervention (microsurgery+embolization)	2	2	1
Total	3	4	2

Based on the Spetzler-Martin scale, the microsurgical approach was selected for one patient with type II AVM and three patients with type III AVM. One patient with grade IV AVM underwent embolization. For one patient with type II AVM, one with type III AVM, and one with type IV AVM, combined treatment was significant (Table 2).

Table 3: Clinical outcomes evaluated using the Rankin Scale for nine children treated with surgical PCF AVM

Rankin Scale	Microsurgery	Embolization	Combined intervention (microsurgery+embolization)	Total
0	1	1	2	4
1	0	0	1	1
2	0	0	1	1
3	0	0	1	1
4	1	0	0	1
5	1	0	0	1
Total	3	1	5	9

Four patients had interventions that did not interfere with vital functions (Rankin Scale: 0); two of these patients received combination interventions; one patient had microsurgery; and one patient had embolization. One patient for whom the combined intervention technique was selected did not exhibit significant deterioration of vital functions (Rankin scale -1). One patient who received combination treatments showed mild deterioration of vital functions (Rankin Scale -2). One patient who received combination treatments had mild impairment (Rankin Scale -2).

Table 4. (GCS – Glasgow Coma Scale, S-M – Spezler-Martin Scale, H-H – Hunt-Hess Scale, MS - microsurgery, EVE – endovascular embolization, CI – combined intervention)

№	**Age**	**Gender 0-M 1-F**	**Admission period 1- the most acute (24 hours) 2 - acute (21 days) 3 - subacute (up to 3 months)**	**GCS**	**Hematoma vol./Brain vol. percentage ratio (%)**	**SM**	**Graeb**	**PedNIHSS**	**H-H**	**Treatment Methods**			**Intraop. Blood loss (blood volume, %)**	**HC (hydrocephalus)**	**Rankin**
										MS	**EVE**	**CI**			
1	7	1	1	13	1,1	3	1	3	3	0	3	0	<15% BV	yes	0
2	16	1	2	15	0,6	4	0	1	1	0	4	0	<15% BV	no	0
3	11	1	1	15	0,4	2	1	0	1	0	0	1	<15% BV	no	1
4	16	1	1	4	2,4	2	3	34	5	1	0	0	<15% BV	no	5
5	11	0	2	9	1,05	3	0	12	1	1	0	0	<15% BV	no	0
6	15	0	1	4	2,8	3	6	34	5	0	0	1	<15% BV	no	3
7	11	0	1	4	2,2	3	10	35	5	0	0	1	<15% BV	no	2
8	16	1	3	15	0,3	4	0	3	1	0	0	1	<15% BV	no	0
9	15	1	2	4	2,7	3	9	35	5	1	0	0	<15% BV	no	4

One patient who received combination treatments had moderate impairment (Rankin Scale: 3). One patient who received microsurgical intervention had severe impairment of vital functions (Rankin Scale: 4). One patient who received microsurgical intervention died after experiencing severe impairment of critical functions (Rankin Scale -5), which is most likely related to a Covid-19 infection rather than the surgical procedure.

4. Example of A Case Presentation

A 10-year-old boy with acute occipital headache, accompanied by nausea and vomiting, was brought to the emergency room and lost consciousness during transport, according to his family. Upon admission to the intensive care unit of the Moscow Children's Municipal Clinical Hospital of the Moscow Department of Health, he was in serious condition: GCS: 3 points, HUNT-HESS stage V, NIH Pediatric Stroke Scale (NIHSS): 19-20 points, Graeb: 8 points. Appropriate imaging studies were performed, detecting the presence of intracerebral, intraventricular, or subarachnoid hemorrhage. We proceeded to surgery, in which we performed complete excision of the arteriovenous malformation (AVM), with embolization and post-radiation obliteration, evaluating the results under angiographic supervision. Complete excision with no contrast of the AVM, subtotal excision with minimal contrast (1% to 30% of the original volume), and partial excision with a contrast of the AVM between 31% and 99% of the original volume. No complications were noted during the postoperative period, and the patient was kept under evaluation of ICU.

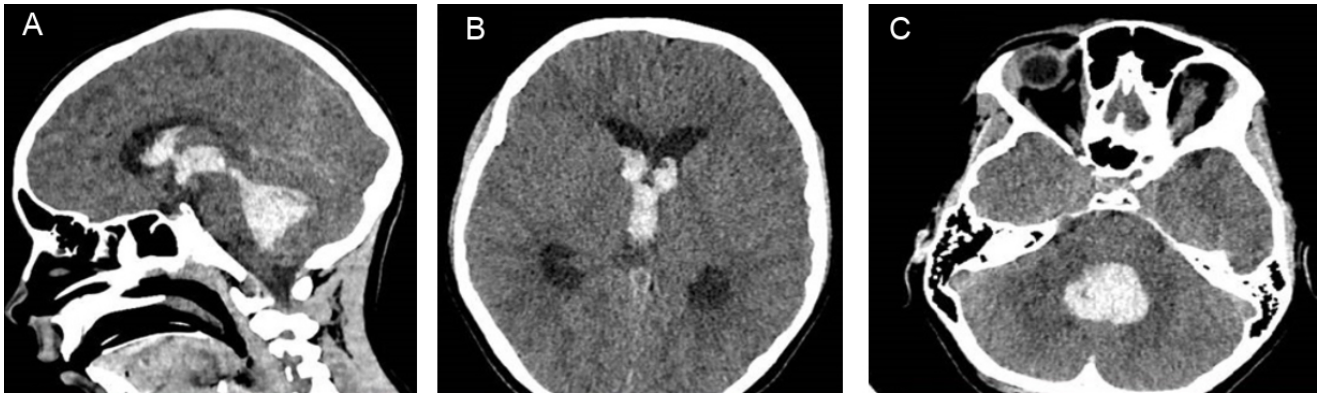

Figure 1. Computed tomography of the brain without contrast enhancement (CT of the brain without CE)

A - sagittal projection. B and C - axial projection; according to native CT of the brain (Fig. 1) from 03.11.2020: intraventricular hemorrhage (IH) is visualized. IH is spreading from the IV ventricle (IV ventricular hemotaponade with brain stem compression) to the III ventricle and lateral ventricles (total volume of 41.1 cc). Brain Lab neuro-navigation station was used to determine the volume of the hematoma. The next day, the child underwent decompression at the level of the craniovertebral junction with simultaneous removal of the hematoma and dura mater plastic surgery; blood loss was less than 15% of the total BV.

No data indicating the presence of vascular pathology was obtained intraoperatively. The histological tissue samples obtained intraoperatively confirmed the absence of factors indicating the presence of vascular pathology.

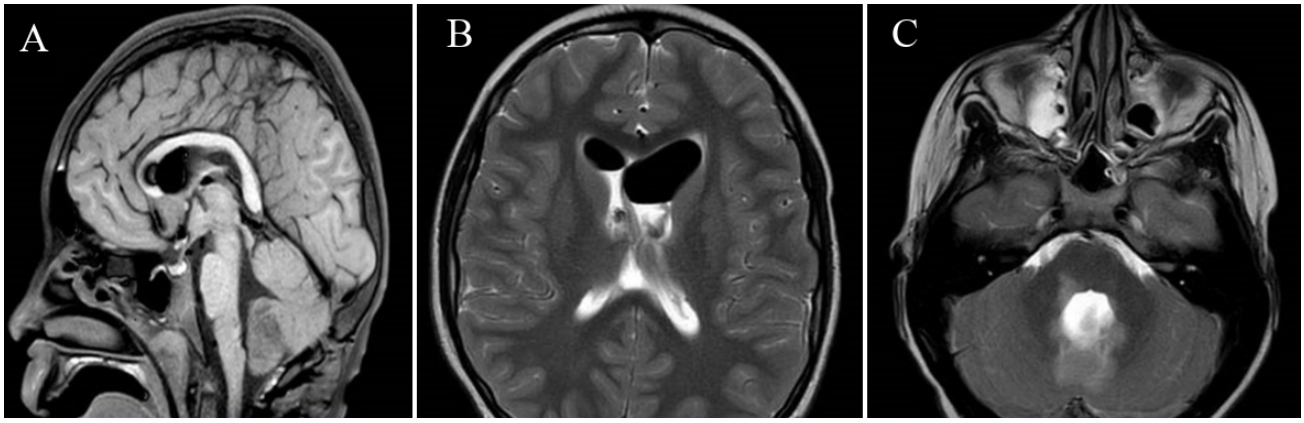

Figure 2. The brain MRI on the 1st day after microsurgical hematoma removal (IV ventricle)
A – sagittal projection. B and C – axial projections;

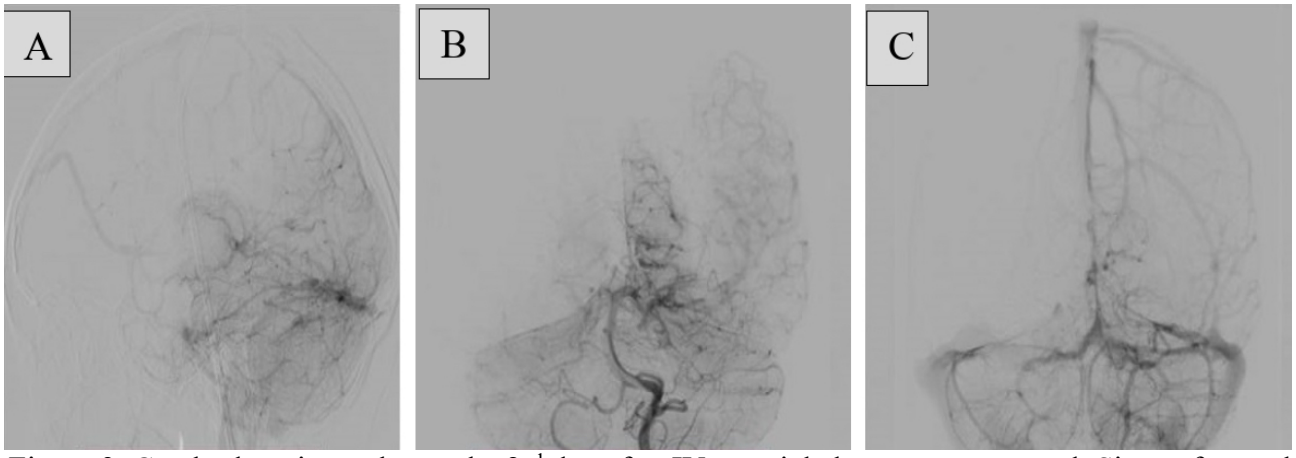

Figure 3. Cerebral angiography on the 2nd day after IV ventricle hematoma removal. Signs of vascular malformations presence are not observed.

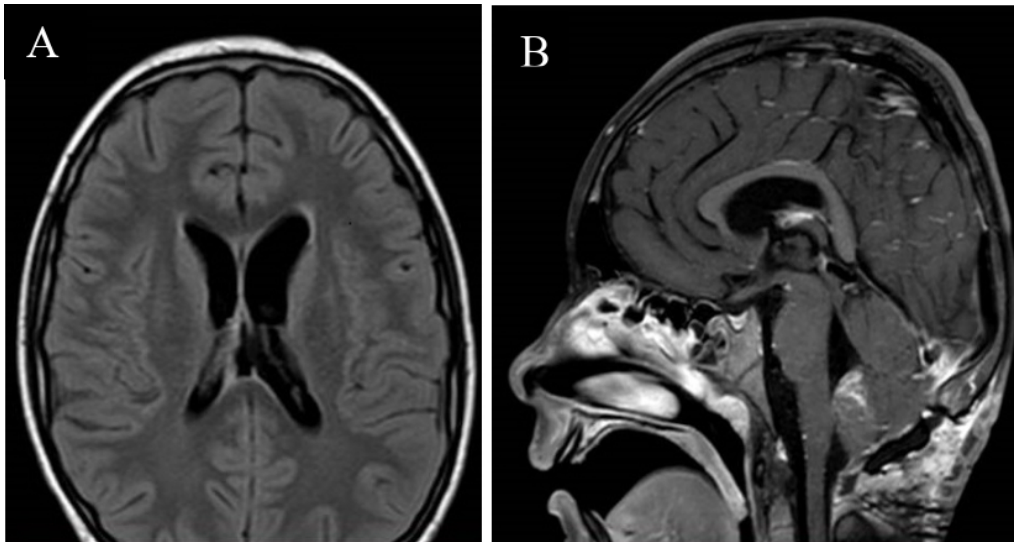

Figure 4. The brain MRI on the 17th day after hematoma removal (IV ventricle)

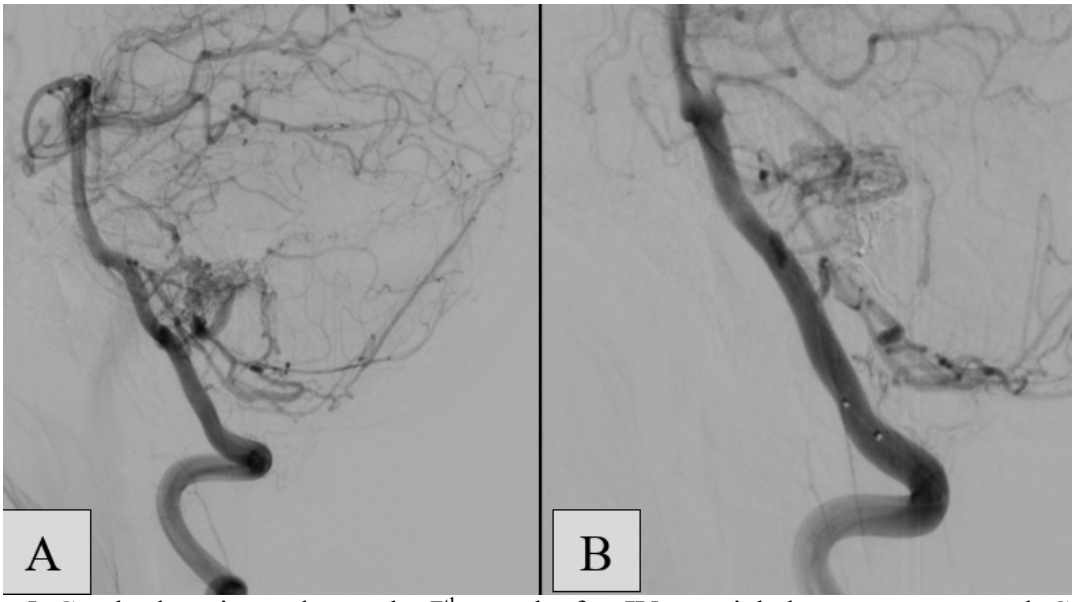

Figure 5. Cerebral angiography on the 7th month after IV ventricle hematoma removal. Control CAG with simultaneous embolization of parastem and intrastem AVM (Spetzler-Martin Scale – 2).

The clinical characteristics, hemorrhagic risk, and post-hemorrhage prognosis of patients with AVMs in the PCF region are not well documented. Nine out of 88 patients in our study had ruptured PCF AVMs, according to a retrospective investigation of our AVM database. Based on available data, this study represents the largest cohort of patients with ruptured PCF AVM documented in the literature. Our set of investigations examined clinical signs, AVM angioarchitecture, bleeding risk, and immediate outcomes following hemorrhage; nevertheless, there were not enough children to reach a definitive conclusion, necessitating additional research on the matter.[13] Our clinical example demonstrates that, in order to rule out cerebral AVM in cases of hemorrhagic stroke with unclear genesis, primary CAG monitoring of the patient's status is required six months following the hemorrhage.

Table 5. (GCS- Glasgow Coma Scale, S-M – Spezler-Martin Scale, brain AVM – brain arteriovenous malformation, PCF AVM – posterior cranial fossa arteriovenous malformation)

№	Author, Country, Year	Period	Number of children w/ brain AVM	Number of children w/ PCF AVM rupture	Clinical picture	GCS	SM	Admission period	Hematoma vol./Brain vol. percentage ratio (%)	Treatment Methods			Intraop. blood loss (blood volume, %)	Rankin
										MS	EVE	CI		
1	Arkar U., Slovenia, 2022	2000-2020	12	3(25,0%)	-	-	II-III	-	-	2	1	0	-	-
2	LoPresti M.A., USA, 2020	2005-2018	105	12(11,4%)	-	-	-	-	-	-	-	-	-	-
3	Eliava SSh. Russia, 2020	2008-2017	376	51(13,5%)	-	-	-	-	-	18	15	4	-	-
4	Steinberg J.A., USA, 2021	2002-2019	89	13(14,6%)	-	-	-	-	-	-	-	-	-	-
5	Tong X., China ,2016	2000-2015	225	65(28,8%)	-	-	-	-	-	-	-	-	-	-
6	Thomas B., France, 2014	1997-2012	106	17(16,3%)	-	-	-	-	-	-	-	-	-	-
7	Zokhidov Z. Russia, 2025	2015-2023	88	9(10,2%)	General cerebral symptoms	7±4	II-IV			3	1	5	<15% of BV	3±2

5. Discussion

Most colleagues do CT or MRI first, followed by CAG, in accordance with the gold standard for diagnosing PCF AVMs.[1, 2, 3, 26] The type of intracranial hemorrhage, the existence of brain edema, the link between the AVM and the brainstem structures, and the state of the cerebellar and brainstem structures can all be evaluated with a brain CT scan.On the other hand, tumor differential diagnosis might be challenging. Since brain MRIs are required for the planning of radiosurgery and microsurgery, they are seen to be the most promising technique for detecting AVM in children today. The presence of a hemorrhage, fourth ventricle displacement and deformation, and occlusive triventriculomegaly are the diagnostic criteria for a ruptured PCF AVM on MRI or CT.[11, 24, 26]

Brain cells are poisoned by intracranial hematomas. This is an additional justification for ICH removal. Heme and hemoglobin (Hb) are strong cytotoxic substances that have the ability to kill a large number of brain cells. After roughly 24 hours, erythrocyte lysis starts and lasts for a few days, releasing cytotoxic hemoglobin (Hb). The health of the brain tissues next to the hematoma is directly threatened by hemoglobin and its breakdown products, iron and heme. The generation of free radicals, primarily via Fenton-type chemicals, is the mechanism underlying hemoglobin toxicity.[2] In our cohort, endovascular embolization was utilized in 50% of cases (Table 5), and 83% of children needed several procedures. In contrast to the findings of the aforementioned meta-analysis, complete obliteration was only accomplished in one instance. Prior to microsurgical resection, embolization may help make AVMs more resectable and lower the risk of neurological problems after surgery.[8]

Our preliminary experience with embolization of cerebral AVMs is promising: total obliteration with embolization alone was attained in 21.2% of instances, and their size is reduced by 78% on average. The majority of patients only required one embolization session to accomplish total obliteration or a significant enough size reduction for radiosurgery or surgery. Although it varies from study to study, the rate of full endovascular obliteration is typically thought to be around 20%. In a cohort of 49 patients, Fournier et al. found a 14% total obliteration rate. In a smaller series of 27 patients, Yu et al. observed a 22% complete embolization rate. As an exception, Valavanis and Yasargyl reported that 387 patients had a 40% success rate with n-BCA angiographic treatment. A smaller group of patients (23 patients) had greater complete embolization rates (57%) according to Van Rooij et al. total initial occlusion of 14 AVMs (21.2%) was attained by 66 patients treated with endovascular embolization in our retrospective analysis, but the percentage of total obliteration during follow-up was 19.7% (13 of 66 patients).

AVM features such as supratentorial and cortical placement, compact and plexiform lesions, few feeding veins, and one superficial draining vein have been linked to increased occlusion rates following embolization. According to van Rooij et al., tiny AVMs with one or two feeding pedicles could achieve total obliteration. AVMs greater than 3 cm were usually embolized to make them smaller, safer during surgery, or radiosurgery accessible (AVMs < 3 cm). Angioarchitecture that is appropriate for embolization can be found in certain tiny AVMs (≤3 cm), particularly those with one or two feeding pedicles. Pediatric patients with AVMs can safely and effectively undergo the endovascular surgery. Small AVMs with one or two feeding pedicles can be completely obliterated, whereas bigger AVMs can be sufficiently shrunk for further stereotactic radiosurgery or microsurgery. According to our experience and the findings of researchers from China, Switzerland, and the USA, the multimodal approach is the best course of treatment for AVMs in general and PCF AVMs in particular. Although stereotactic techniques before AVM resection are also appropriate [6], the most popular approach is the first embolization of AVMs followed by resection.[2, 3, 5, 6, 8]

According to Spetzler-Martin, a PCF AVM grade III, which ranges in size from 3 to 6 cm, is most likely to have an adverse outcome.[2, 8] In patients who had passed away, PCF AVM was found four times more frequently.[9]

Numerous studies show that combination therapy has favorable outcomes (18, 19). The danger of blood loss is greatly decreased and the operation time is shortened with preliminary endovascular embolization, which is particularly crucial for younger patients. The problematic AVM vasculature' sticky character makes it possible to distinguish the AVM stroma from the unaltered brain parenchyma that contains normal vessels with greater accuracy.

About half of all strokes in children and adolescents are hemorrhagic strokes; however, there is a dearth of reliable information regarding the prevalence of ICH in children, which causes the PCF AVM to rupture.[7, 14, 15] According to research from W.F. McCormick et al. and co-authors, 7.5% of all AVMs in the brain are PCF AVMs.[1] Pediatric cohorts have not been prospectively investigated for PCF AVM ruptures. But according to a recent retrospective investigation by T.E. Darsaut [3], out of all cerebral AVMs, 120 children with AVMs had an annual bleeding rate of 4%. According to B.A. Gross [4], the retrospective annual bleeding rate in this dataset would be 5.5% if we assumed that AVMs were present in the surgical cohort from birth.[16]This indicates that children have a 4–6% yearly risk of bleeding from AVMs [18].Because PCF AVM can only be diagnosed after bleeding, the frequency of AVM hemorrhage in the PCF region is two to three times higher than in the supratentorial AVM location. According to some publications, 80–99% of children will experience bleeding from cerebral AVM, which might result in a 25% fatality rate.According to this research, PCF AVMs are uncommon and have a high risk of hemorrhagic consequences.[19, 20, 21]

However, T. Robert et al. and co-authors have supplied more data. PCF AVMs make up just 7–15% of all brain AVMs, with an incidence rate of 2 instances per 10,000 people in the community, according to his article "Endovascular treatment of posterior fossa arteriovenous malformations." V.A. Khachatryan and co-author estimate that about 18% of all AVMs in the brain are located in the posterior cranial fossa region. About 13% of all AVMs in the brain are found in the posterior cranial fossa region, according to S.S. Eliav and co-authors. Nevertheless, these numbers pertain to both ruptured and unruptured AVMs in the brain, and there is no information available for children with ruptured AVMs in the posterior cranial fossa region alone. Our findings show that 10% of all ruptured AVMs in the brain are PCF AVMs in children, which is the greatest proportion compared to other reports.[24, 25, 27]

AVM size and location, cerebral bleeding type, brainstem compression, and degree of closure of cerebrospinal fluid-containing spaces are all included in the clinical picture.[2, 4, 9, 24] From mild cranial nerve injury and general cerebral symptoms to severe brainstem dysfunction, cerebellar abnormalities, and consciousness depression, neurological state can vary greatly. Our findings showed that the hemorrhagic type of symptoms occurred in 100% of children. Patients with prevalent general cerebral symptoms were admitted throughout the most acute, acute, and subacute phases. The time of patient admission was not indicated in any of the studies that were retrospectively examined (Table 5). Although children were admitted to Morozov Hospital during acute and subacute periods, their outcomes were favorable. One child in serious condition was moved to another clinic after COVID-19 was discovered, whereas four of the children admitted during the acute phase were in satisfactory health. Although this data is insufficient to draw conclusions, it can be used as an illustration of how more significant complications are more likely to manifest during the acute period after admission.

The existence of concurrent vascular lesions, such as aneurysms within the AVM, may be one of the factors contributing to the elevated risk of PCF AVM rupture. Nine out of fourteen patients with burst AVM had aneurysms, according to a study by P. Griffiths et al. [22] The study by Rodríguez-Hernández et al. [23] found that concurrent aneurysms were present in only 20% of individuals with PCF AVM. This number was 11.1% in our series. Different patient selection standards used by various healthcare facilities could account for these disparities.

There is an assumption that the rupture of an aneurysm inside the core of the PCF AVM is one of the causes of the formation of an intracranial hematoma. However, the problem of confirming this hypothesis is the inability to visualize a ruptured aneurysm within the core of the PCF AVM in children due to the lack of a pathognomonic picture. This issue requires further large-scale multicenter study including several cohorts of patients.

Since it makes it possible to accurately determine the afferent and draining vessels, the extent of the malformation, and related vascular pathologies, cerebral angiography (CAG) is regarded as the gold standard in the diagnosis of PCF AVM. Since it is sometimes possible to fill the PCF AVM from the arteries of this basin, catheterization of the vertebral, external carotid arteries is done in cases of PCF AVM. This treatment can only be carried out under general anesthesia or sedation for younger children. (24, 25, 26) Fig. 5.

The scheduling of CT, MRI, and CAG in cases of PCF AVM rupture is still up for debate, though. Data on 603 children who were part of the study are provided by A.V. Hav et al. and associates from the Columbia College of Physicians and Surgeons. Of these youngsters, 50 had a hemorrhagic picture, and 72 had an infratentorial AVM placement. The authors stress that individuals with hemorrhagic signs had a much higher frequency of infratentorial AVM location than those without hemorrhagic indications. In the context of a multivariate model, the statement is still accurate [1]. This demonstrates the importance of early detection and treatment as well as the significant risk of PCF AVM rupture.

In 1925, W. Dandy carried out the procedure for PCF AVM for the first time. The vertebral artery was tied and the posterior cerebral fossa was decompressively trepanated. Today, endovascular embolization, radiosurgical therapy, and microsurgical open surgeries are the three primary approaches used to treat AVM of the brain. Nonetheless, there are currently no unambiguous indications for the use of each technique and sequence in treating children's AVM of the brain.[14, 24] Intracranial pressure (ICP) rises as a result of AVM rupture and ICH development. Depending on the clinical circumstances and the site of the bleeding, it must be removed by external ventricular drainage, hematoma evacuation, and/or decompressive craniotomy with prolonged duroplasty. Limited hematoma evacuation is advised only in cases where an underlying AVM is suspected of generating hemorrhage (in the event of a mass effect), as aggressive hematoma evacuation may cause AVM re-rupture.(14, 25)

When a child has experienced a bleed, the timing of cerebral AVM treatment is crucial. The examined studies did not provide us with information on the timing of admission. In our investigation, every patient was admitted during the most acute, acute, and subacute times. Three kids underwent surgery after 24 hours from the time of admission, and seven children were already undergoing surgical therapy within that time.

Children who lose a quarter of their blood volume after surgery may have shock and rapidly decompensate, necessitating close observation and donor blood replacement. Special emphasis should be given to staged hemostasis and reducing blood loss during surgeries intended to remove AVMs in children. There is a significant chance of blood loss with the excision of an intracranial hematoma and brain AVM. However, our results show that intraoperative blood loss during microsurgical removal of hematoma and AVM is less than 15% of the total blood volume, regardless of the size of the AVM and the time of admission of children with ruptured PCF AVM. [24, 28]

5–25% of children with AVM who received surgical treatment showed signs of impairment, per the analyzed studies.(18, 19) Our study found that the degree of disability following surgery was (10.1). In children, the overall fatality rate from ruptured AVMs is 21%.[20] Patients with PCF AVMs had a terrible prognosis, with mortality rising to 66.7% following the initial bleed, according to Fults and Kelly's report on the natural history of cerebral AVMs [10]. There was only one deadly outcome in our case series. Notably, the patient who died after surgery tested positive for COVID-19 and was

taken to a hospital that treats infectious disorders.

6. Conclusion

Rare, complicated lesions with an aggressive natural history are posterior fossa arteriovenous malformations. Both the pathology and the infratentorial hemorrhage need to be treated right away. However, because they are rare, it is challenging to collect data and do clinical and statistical analysis. Children with AVMs have a longer life expectancy, and the significant risk of cumulative hemorrhage from PCF AVMs can cause impairment. If feasible, radical resection of the PCF AVM should be the goal of a more aggressive therapeutic approach in conjunction with a child's improved nervous system's capacity for regeneration. More research is needed on PCF AVM ruptures in youngsters. Children suspected of having a hemorrhagic stroke should be admitted to a multidisciplinary hospital with radiology, neurosurgery, resuscitation, and endovascular services.

In the initial phases following a hemorrhage, surgical techniques enable favorable results for the majority of patients. Complete remission of neurological symptoms is one of the good outcomes of PCF AVM therapy using contemporary microsurgical and endovascular techniques. Patients' quality of life is enhanced and disability rates are decreased as a result.

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