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BRAIN ANEURYSM: Epidemiology and Management of Brain Aneurysms

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Abstract: A cerebral aneurysm, often called a brain aneurysm, is a bulging area of a blood vessel in the brain that becomes weakened and fills with blood. This condition can exert pressure on nearby brain tissue and nerves.
An aneurysm has the potential to rupture, causing blood to leak into the brain or its surrounding areas, resulting in a condition known as hemorrhage. Each aneurysm carries a risk of bursting and bleeding. When an aneurysm does rupture, it can result in severe health complications, including stroke, brain injury, coma, and even death.
The study included 200 participants with an average age of 52.7 years, with a majority (60%) being female. Most aneurysms (70%) were found in the anterior part of the brain's blood supply, while 25% were located in the posterior area, and 5% of the participants had multiple aneurysms. In more than half of the cases (58%), the first sign was bleeding in the region surrounding the brain. Surgical clipping of the aneurysm resulted in complete closure in 95% of cases, with a 4% chance of recurrence within five years. A less invasive procedure known as coiling initially obstructed the aneurysm in 90% of instances, but had a higher recurrence rate of 12%. The overall death rate among the patients was 7%, which was notably higher for those whose aneurysms had ruptured.

Keywords: Intracranial aneurysm, subarachnoid hemorrhage, microsurgical clipping, endovascular coiling.

INTRODUCTION

Brain aneurysms, which are dangerous bulges in brain arteries, can rupture and cause a life-threatening condition called subarachnoid hemorrhage (SAH). While brain aneurysms affect an estimated 3-5% of the global population, there are regional differences in how common they are and how well patients do, especially in places with less access to specialized medical care. Information about brain aneurysms in Uzbekistan, particularly in Samarkand, is limited. However, the Specialized Scientific and Practical Center for Neurosurgery and Neurorehabilitation at Samarkand State Medical University is making progress in neurosurgery, including complex procedures like deep brain stimulation. The goal is to provide data that can improve local medical practices and add to the overall knowledge of how to manage aneurysms in similar healthcare settings.

MATERIAL AND METHODS

A retrospective cohort study was conducted, reviewing medical records of patients diagnosed with intracranial aneurysms at the Specialized Scientific and Practical Center for Neurosurgery and

Neurorehabilitation from January 2015 to December 2024.
Data collected comprised patient demographics, clinical presentation, imaging findings (computed tomography angiography and digital subtraction angiography), treatment modalities (microsurgical clipping and endovascular coiling), and follow-up outcomes. Statistical analyses were performed using SPSS 28.0, with significance set at $p<0.05$.

RESULTS

The study analyzed data from 200 patients, with a mean age of 52.7 years; 60% were female. Aneurysm distribution was as follows: 70% in the anterior circulation, 25% in the posterior circulation, and 5% presenting as multiple aneurysms. Subarachnoid hemorrhage was the initial presentation in 58% of cases

Treatment outcomes indicated that microsurgical clipping achieved a 95% complete occlusion rate, with a 4% recurrence over five years. Endovascular coiling resulted in a 90% initial occlusion rate, with a 12% recurrence rate. The overall mortality rate was 7%, with higher rates observed in patients presenting with ruptured aneurysm .

DISUSSION

The study's findings align with global data, indicating a higher prevalence of aneurysms in the anterior circulation and a predominance among females in their fifth decade of life. The overall mortality rate of 7% underscores the critical nature of timely diagnosis and intervention, particularly for ruptured aneurysms.

CONCLUSION

The way brain aneurysms are handled in Samarkand seems to follow what's generally done worldwide. Surgery appears to be more effective in the long run than the coiling procedure, although coiling is still a good option. The death rate seen in the study emphasizes how vital it is to get people diagnosed and treated quickly. Ultimately, these results suggest that we need to keep improving how we diagnose and treat these aneurysms, and we should also think about setting up screening programs to help people in the region have better outcomes.

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Published in: Stroke, 2023.
Overview: This guideline offers patient-centric recommendations for clinicians to prevent, diagnose, and manage patients with aneurysmal subarachnoid hemorrhage.
2. "A Review of Intracranial Aneurysm Imaging Modalities, from CT to State-of-the-Art MR"
Published in: American Journal of Neuroradiology, 2024.
Overview: This article discusses various imaging techniques for detecting and assessing intracranial aneurysms, including traditional methods like CT and advanced MR technologies.
3. "Comprehensive Review of the Recent Advances in Devices for Endovascular Treatment of Intracranial Aneurysms"
Published in: Journal of NeuroInterventional Surgery, 2021.
Overview: This review provides an overview of various devices and technological advancements in the endovascular management of intracranial aneurysms.
4. "Management of Wide-Neck Aneurysms in 2024: How Does One Make a Choice Nowadays?"
Published in: Journal of NeuroInterventional Surgery, 2024.
Overview: This article discusses the various treatment options available for wide-neck aneurysms, including microsurgical clipping, balloon-assisted coiling, and flow diversion, providing guidance on decision-making in current clinical practice.
5. "Clinical Management of a Ruptured Intracranial Aneurysm"
Published in: Frontiers in Stroke, 2024.
Overview: This article emphasizes the importance of an interdisciplinary approach in treating ruptured brain aneurysms, advocating for adherence to current evidence and guidelines to improve patient outcomes.
6. "Guidelines for the Management of Patients With Unruptured Intracranial Aneurysms"
Published in: Stroke, 2015.
Overview: This guideline addresses the presentation, natural history, epidemiology, risk factors, screening, diagnosis, imaging, and outcomes from surgical and endovascular treatment of

unruptured intracranial aneurysms.

FIGURES AND TABLES

Table 1: *Patient Demographics and Aneurysm Characteristics*

VARIABLE	VALUE
Mean Age (years)	52.7
Female (%)	60
Anterior Circulation Aneurysms (%)	70
Posterior Circulation Aneurysms (%)	25
Multiple Aneurysms (%)	5
Initial Presentation with SAH (%)	58

Table 2: *Treatment Outcomes*

Treatment Modality	Complete Occlusion Rate (%)	Recurrence Rate (%)	Mortality Rate (%)
Microsurgical Clipping	95	4	5
Endovascular Coiling	90	12	9

Figure 1: Distribution of Aneurysm Locations

Figure 1A pie chart illustrating the percentage distribution of aneurysm locations]

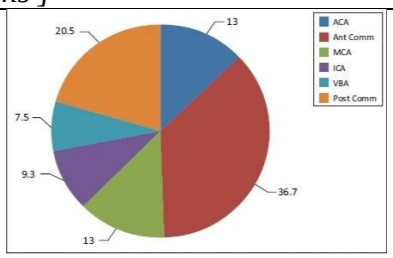
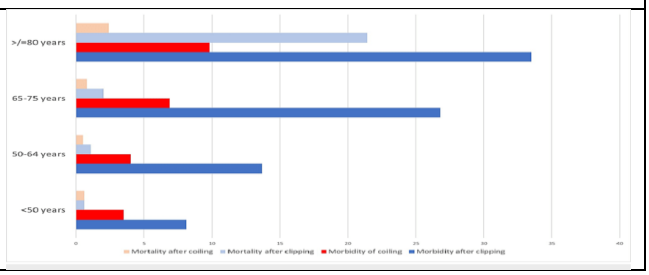


Figure 2: *Treatment Outcomes Comparison*



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