

10. **INTRAOPERATIVE COMPLICATIONS IN CEREBRAL ENDOVASCULAR ANEURYSMAL SURGERY: A RETROSPECTIVE SINGLE-CENTER STUDY (2019-2023)**

Andrej Terzić¹, Reza Mashaghi Tabari¹, Ivan Vukašinić², Žarko Nedeljković², Aleksa Mičić³, Mihajlo Ćurčić¹, Lukas Rasulić³.

¹ University of Belgrade, Faculty of Medicine.

² Department of Interventional Neuroradiology, Clinic for Neurosurgery, University Clinical Centre of Serbia, Belgrade, Serbia.

³ University of Belgrade, Faculty of Medicine, Department of Peripheral Nerve Surgery, Functional Neurosurgery, and Pain Management Surgery, Clinic of Neurosurgery, University Clinical Centre of Serbia, Belgrade, Serbia.

 <https://www.youtube.com/watch?v=vlsNiqV1-28&t=10767s>

BACKGROUND: Endovascular cerebral aneurysm surgery, also known as endovascular neurosurgery, represents a minimally invasive approach aimed at diagnosing and treating intracerebral aneurysms through the use of catheters, wires, and various specialized instruments. This innovative approach has emerged as a promising alternative to traditional open surgical methods for addressing cerebral aneurysms. However, it is essential to acknowledge that while endovascular procedures offer numerous advantages, such as reduced morbidity and mortality rates, they are not devoid of associated risks, some of which can have life-threatening consequences. This paper seeks to delve into the realm of intraoperative complications in patients undergoing endovascular treatment for aneurysms, shedding light on the challenges and complexities within this field. **METHODS:** For this retrospective investigation, we conducted a comprehensive analysis of medical records spanning a five-year period, from 2019 to 2023. These records were obtained from the Neurosurgical Clinic of Belgrade, located within the University Clinical Center of Serbia. The study cohort comprised 44 patients who encountered intraoperative complications during endovascular aneurysm treatment. Patient information, including age, gender, aneurysm size, location, specific segment, and details regarding the nature of the intraoperative complications, was meticulously collected. Subsequently, the gathered data underwent rigorous statistical analysis. **RESULTS:** Out of a total of 429 patients who underwent endovascular treatment for aneurysms, 44 experienced intraoperative complications. The average age of these individuals was 55.4 years, ranging from 13 to 83 years, with the majority being women (37 out of 44, or 84.1%). Thirteen patients (29.5%) presented with significant preoperative co-morbidities and had previously experienced subarachnoid hemorrhaging before undergoing treatment. The most prevalent location for aneurysms was the internal carotid artery (ICA), accounting for 40.9% of cases, with the C6 segment being the most frequently affected at 27.3%. Other notable locations included the anterior communicating artery (ACoA) at 34.1% and the middle cerebral artery (MCA) at 13.6%. Regarding intraoperative complications, technical issues were the most frequent, affecting 84.1% of patients, while biological mishaps impacted 7 out of 44 patients (15.9%). Coil failure occurred in 16 out of 44 patients (36.4%), and stent failure was observed in 14 out of 44 patients (31.8%). Catheter-related problems were noted in 5 patients (11.4%), as were thromboembolic events, also in 5 patients (11.4%). Contrast extravasation was observed in 3 patients (6.8%), and hematoma formation occurred in 1 patient (2.3%). Additionally, 12 out of 44 aneurysms were found to be ruptured (27.3%). In this retrospective study spanning five years, our investigation focused on

intraoperative complications in 44 out of 429 patients who underwent endovascular aneurysmal surgery. Our findings underscored that the primary source of these complications was related to technical issues, aligning with observations from previously referenced studies. Notably, coil and stent failures emerged as prominent concerns, along with catheter-related problems and thromboembolic events. **CONCLUSION:** In conclusion, the endovascular approach to treating aneurysms, while offering a minimally invasive option, is not exempt from inherent risks and complications. Despite these challenges, endovascular neurosurgery continues to hold significant value as a crucial alternative for the treatment of intracerebral aneurysms.

Table. Types of Intraoperative Complications

		Complications			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Catheter Failure	5	11.4	11.4	11.4
	Coil Failure	16	36.4	36.4	47.7
	Extravasation	3	6.8	6.8	54.5
	Stent Failure	14	31.8	31.8	86.4
	Thrombosis	5	11.4	11.4	97.7
	Hematoma	1	2.3	2.3	100.0
Total		44	100.0	100.0	

Key words: Aneurysm; Endovascular; Complications; Bleeding; Coiling (Source: MeSH-NLM).