

The use of intravascular [papaverine](#) as an alternative treatment for reversible vasospasm is associated with various side effects including hemodynamic instability like bradycardia and hypotension. Some recent studies have pointed out that washing aneurysmal arteries and subarachnoid space with papaverine may not have many complications and hemodynamic disorders besides preventing aneurysmal vasospasm <sup>1)</sup>

Washing with papaverine significantly reduces cerebral blood flow and relieves vasospasm <sup>2)</sup>.

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The role of aggressive surgical manipulation with clot evacuation, arachnoid dissection, and papaverine-guided adventitial dissection of large vessels during ruptured aneurysm surgery in reducing [vasospasm](#) is controversial.

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Eighty patients suffering [subarachnoid hemorrhage](#) with serious [cerebral vasospasm](#) underwent [endovascular treatment](#) using intra-arterial application of [Papaverine-Hydrochloride](#) (IAP) or transluminal balloon [angioplasty](#) (TBA). Angiographic response and infarction rate was classified based on pre- and postinterventional angiographic images and CT scans.

In 90% of patients [vasospasm](#) could be improved. In most cases (78.8%) IAP was used. Re-treatment after IAP was necessary in 32.9% of patients, but never after TBA. 233 vascular territories were treated in 128 procedures. Angiographic improvement was observed in 66.5% of territories, which was significantly associated with early intervention ( $p=0.02$ ), use of TBA ( $p=0.01$ ) and dose of IAP ( $p=0.01$ ). DCI occurred in 47.5 % of patients. Territorial infarction was associated with poor Hunt&Hess grading ( $p=0.03$ ), day of aneurysm treatment ( $p=0.01$ ), severe vasospasm before ( $p=0.02$ ) and after treatment ( $p=0.03$ ), and number of interventions ( $p=0.01$ ). However, infarction rate was independent of angiographic response.

The discrepancy of excellent angiographic results and high incidence of DCI may stem from inaccurate/delayed diagnosis of impending ischemia. In view of the limited time window, optimized peri-interventional management and continuous cerebral multimodality neuromonitoring might be crucial for ideal timing of endovascular procedure to prevent cerebral infarctions <sup>3)</sup>.

<sup>1)</sup>

Rath GP, Mukta H, Prabhakar H, Dash HH, Suri A. Haemodynamic changes after intracisternal papaverine instillation during intracranial aneurysmal surgery. Br J Anaesth. 2006;97:848-50.

<sup>2)</sup>

Sabouri M, Rahmani P, Rezvani M, Nikbakht H, Rafiee A, Torkashvand M, Eshraghi N, Nourian N, Moradi M. The effect of irrigation of intracisternal papaverine on cerebral blood flow in subarachnoid hemorrhage. Adv Biomed Res. 2013 Jun 29;2:45. doi: 10.4103/2277-9175.114184. eCollection 2013. PubMed PMID: 24516845.

<sup>3)</sup>

Hosmann A, Rauscher S, Wang WT, Dodier P, Bavinzski G, Knosp E, Gruber A. Intra-arterial Papaverine-Hydrochloride and Transluminal Balloon Angioplasty for the Neurointerventional Management of Delayed Onset Post Aneurysmal Subarachnoid Hemorrhage Vasospasm. World Neurosurg. 2018 Jul 24. pii: S1878-8750(18)31616-4. doi: 10.1016/j.wneu.2018.07.138. [Epub ahead of print] PubMed PMID: 30053563.

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