

Abstract Submitted
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Correlation between Hemodynamics and Treatment Outcome of Intracranial Aneurysms after Intervention with Flow Diverters¹ NIKHIL PALIWAL, ROBERT DAMIANO, JASON DAVIES, ADNAN SIDDIQUI, HUI MENG, University at Buffalo, the State University of New York — Endovascular intervention by Flow Diverter (FD) - a densely woven stent - occludes an aneurysm by inducing thrombosis in the aneurysm sac and reconstructing the vessel. Hemodynamics plays a vital role in the thrombotic occlusion of aneurysms and eventual treatment outcome. CFD analysis of pre- and post-treatment aneurysms not only provides insight of flow modifications by FD, but also allows investigation of interventional strategies and prediction of their outcome. In this study 80 patient-specific aneurysms treated with FDs were retrospectively studied to evaluate the effect of intervention. Out of these cases, 16 required retreatment and thus are considered as having unfavorable outcome. Clinical FD deployment in these cases was simulated using an efficient virtual stenting workflow. CFD analysis was carried out on both pre- and post-treatment cases, and changes in hemodynamic parameters were calculated. Support vector machine algorithm was used to correlate the hemodynamic changes with outcome. Results show that cases having higher flow reduction into the aneurysmal sac have a better likelihood of occlusion. This suggests that changes in hemodynamics can be potentially used to predict the outcome of different clinical intervention strategies in aneurysms.

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