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A Propensity-Matched Analysis of Outcomes for Patients With M2 Branch Occlusions at Endovascular Stroke Centers

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Introduction: Endovascular therapy (EVT) for Emergent Large Vessel Occlusion (ELVO) is recommended for patients with acute proximal MCA (M1 segment) occlusions (Class I, level A evidence), but the benefits of EVT are uncertain in patients with M2 and more distal occlusions. The purpose of this study was to compare the efficacy and outcomes of EVT-treated M2 ELVOs with EVT-treated M1 ELVOs, and to examine the outcomes of EVT-treated M2 ELVO patients with those whose M2 ELVOs were not treated. Methods: Data were obtained from a multi-hospital system of patients from January 2014 and May 2018. Two propensity score (PS)-based nearest-neighbor matching analyses were used to match similar patients who had 1) EVT-treated M1 vs EVT-treated M2 ELVOs and 2) EVT-treated vs non-EVT-treated M2 ELVOs. Outcomes included length of stay (LOS), rate of successful reperfusion, discharge disposition, symptomatic intracranial hemorrhage (sICH), and discharge mRS. Chi-squared, Fisher's exact, and Mann-Whitney U tests were used to compare matched patients. Results: Overall, 160 patients with EVT-treated M2 ELVOs, 350 with EVT-treated M1 ELVOs, and 113 with non-EVT-treated M2 ELVOs were included. Propensity score analyses resulted in 118 matched patients with EVT-treated M2 and EVT-treated M1 occlusions and 70 matched patients with EVT-treated and non-EVT-treated M2 ELVOs. M2 ELVOs made up 20% of all LVO patients. Treated M1 and M2 ELVOs were similar with respect to baseline NIHSS and outcomes. When attempted,intra-arterial reperfusion of M2 ELVOs was achieved at comparable rates to M1 ELVOs with equal rates of sICH (1.7%). Higher NIHSS was associated with EVT of M2 ELVOs (15.00[8.50,21.00] vs 7.00[4.00,17.75]; $p<0.001$). Rates of mortality trended more favorably in treated M2 ELVOs (12.9% vs 20), which was not statistically significant ($p=0.362$). Conclusions: EVT for M2 ELVOs is as safe and effective as EVT for M1 vessel ELVOs. Rates of successful reperfusion, discharge mRS, LOS, sICH, discharge disposition and mortality are similar among EVT treated M2 and EVT treated M1 ELVOs. Though not statistically significant, EVT for patients with M2 ELVOs resulted in favorable trends toward higher survival rates of potential clinical significance.