Endovascular Revascularization for Basilar Artery Occlusion

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The basilar artery is the main vessels of the posterior circulation and supplies most of the brainstem and occipital lobes and some parts of the thalamus and cerebellum. Owing to different location and extension of the lesions with basilar artery occlusion, patients with acute basilar artery occlusion present with various clinical symptoms and impairment. Acute basilar artery occlusion is a rare stroke syndrome comprising around 3% with very high mobility and mortality rate of 80-90% without thrombolytic treatment.[1] Several case series and smaller studies reported the effectiveness of the endovascular treatment (EVT) in BA occlusion using outdated EVT techniques or first generation mechanical recanalization devices (MERCI retriever, Penumbra device). Direct comparisons of study results are difficult because most reports are case series with different protocols and study methodology.

In one of the largest case series including 180 patients with acute vertebrobasilar occlusion treated with IV thrombolysis, complete and partial recanalization were achieved in 55 and 19% of the cases, respectively.[2] A meta-analysis involving 10 studies with 316 patients demonstrated a recanalization rate of 64%, a mortality rate of 56%, and a 48% absolute risk reduction of death ($p<0.001$).[3] The superiority of the IA therapy compared with IV therapy in patients with acute basilar artery occlusion is unclear due to insufficient data of randomized control trials. Although higher recanalization rate was obtained with IA therapy than with IV therapy, there was no significant difference in mortality rates and positive outcomes.[4] Recent developments in EVT with mechanical thrombectomy have led to an increasing recanalization rates in large intracranial arterial occlusion. The Basilar Artery International Cooperation Study (BASICS) was the first organized, prospective, observational registry of consecutive patients.[5] The BASICS reported that the poor prognosis after basilar artery occlusion with a third mortality and a third dependency at 1 month. There was no statistical significant superiority for any treatment strategy between IV thrombolysis and IV thrombolysis. However the current interpretation of the results from the BASICS is limited by the recent introduction of stent retriever, which were not available at the time of the study. ENDOSTROKE study is an investigator-initiated multicenter registry for patients undergoing EVT.[6] This study includes 148 consecutive patients with basilar artery occlusion, with 59% having received IV thrombolysis prior to EVT. Thirty-four percent had good and 42% had moderate clinical outcome; mortality was 35% and TICI 2b-3 recanalization was achieved by 79%. Independent predictors of recanalization were better collateral status and the use of a stent retriever in this study.

There is still a lack of prospective data concerning the impact of on outcomes based on treatment strategy. Current data using the newer generation of devices, such as stent retriever and Penumbra MAX systems, suggest the benefit from EVT. Multicenter, prospective studies were warranted to compare the different treatment modalities.

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