

Long-Dwell Time Stent-Retriever Mechanical Thrombectomy is Associated with Decreased Need for Multiple Passes Max Shutran MD; Venkata Dandamudi MD; Adel M. Malek MD, PhD

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Introduction

Mechanical thrombectomy is now the standard of care for acute stroke due to large vessel occlusion (LVO). The most common current techniques include the use of stent retrievers and aspiration through a large bore catheter. Recent data have been divided on whether stent retrievers provide an advantage over aspiration(1,2). Both stent retrievers and suction catheters have been demonstrated in animal models to cause endothelial injury(3). Furthermore, time to recanalization has been shown to strongly correlate with clinical outcome(4). Therefore, it is desirable to minimize the number of passes with a stent retriever. It was hypothesized that allowing the stent retriever to dwell and intercalate with the embolus would result in a lower number of passes needed for successful recanalization.

Methods

All interventions by the senior author using an overlapping split-type stent retriever and proximal balloon guide catheter as the first method of thrombectomy were analyzed. Patients treated with a closed-cell stent retriever or large-bore suction thrombectomy as first attempt were excluded. Based on observations from early cases, a mandatory dwell time of > 8 minutes was instituted after stent retriever deployment within the thrombus prior to guide ballooon inflation and retriever withdrawal. Cases were analyzed for number of stent retriever passes, achievement of mTICI 2b/3 recanalization, and presence of atrial fibrillation as probable etiology.

Results

Of 141 total stroke interventions performed from 2012 to 2017, there were 76 patients treated using an open cell stent retriever with average age of 66.9 years (range: 27 to 91). There were 59 MCA occlusions (M1 or M2), 14 of the ICA, and 5 of the basilar artery. The most common etiology was atrial fibrillation (AF), which was present in 44/76 patients (57.89%). Recanalization (mTICI 2b/3) was obtained in 70/76 patients overall (92.11%). Recanalization was achieved in 42/44 patients with AF versus 28/32 with other etiologies (95.45% vs. 87.5%, p=n.s). Using the long-dwell technique, 39/44 AF patients were recanalized on first pass compared to 19/32 without AF (88.64% vs. 59.4%, p<.003). AF patients underwent a significantly lower number of stent-retriever passes per patient compared to non-AF patients (1.16 vs. 1.53 passes, p<0.014).

Discussion

We have presented our series of stent retriever cases in which the longdwell time technique yielded a high rate of mTICI 2b/3 recanalization (92.11% overall). This compares favorably to rates reported throughout the stent retriever literature (e.g. 76.6% in the SEER intervention analysis, 87.9% in the prospective STRATIS registry)(4,5). Our first pass success was particularly high in strokes due to AF. To our knowledge, other studies have not yet investigated the comparative efficacy of stent retrievers in different stroke etiologies. We suggest that presence of AF can be helpful when deciding on a mechanical thrombectomy method to employ.

 The main weakness of this study is the inability to compare short versus long dwell time or efficacy of other thrombectomy methods in AF. This offers possible directions for future research.

Conclusion

A high rate of first pass recanalization using the long-dwell time technique was achieved, especially in patients with AF. Although it needs to be balanced against the need for rapid flow restoration, a long-dwell time approach appears to help minimize the need for injurious multiple-pass intervention, with only a single pass needed in most cases of AF.



References

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