

## Intra-arterial Alteplase Thrombolysis in Combination with Mechanical Thrombectomy

Daniel M. Heiferman, MD; Daphne Li, MD; Nathan C. Pecoraro; Asterios Tsimpas, MD; William W. Ashley, Jr., MD, PhD,  
MBA

Department of Neurological Surgery, Stritch School of Medicine, Loyola University Medical Center, Maywood, IL

### Introduction

Endovascular therapy including mechanical thrombectomy has revolutionized stroke care in the setting of large vessel occlusion (LVO). Since the publication of the landmark thrombectomy trials, mechanical thrombectomy using stent-retriever devices has become standard. However, the role of concomitant IA-tPA has not been clearly defined in the literature. The goals of this study were to understand the role of intra-arterial alteplase (IA tPA) in the post-thrombectomy study era and to define the most effective use of chemical thrombolysis.

Table 1 (Demographics)

	No IA tPA	IA tPA
N	10	24
Age ( <i>Median, IQR</i> )	73 (67-80)	68 (52-75)
Initial NIHSS ( <i>Median, IQR</i> )	20 (14-24)	20 (17-25)
Hospital (N, %)		
Emergency Department	3 (30%)	8 (33%)
In-Patient	0	4 (17%)
Outside Transfer	7 (70%)	12(50%)

### Methods

Thirty-four patients with LVO causing ischemic stroke who met standard endovascular acute stroke intervention criteria underwent mechanical thrombectomy with or without IA tPA infusion. When IA tPA was used, five milligrams were infused at three time points: 1. cervical internal carotid artery catheterization, 2. stentriever clot engagement, 3. post-recanalization. In all cases, Solitaire™ (Medtronic, Ireland) stentriever device with penumbra aspiration was used for thrombectomy and intravenous tPA was used when indicated.

### Results

Twenty-four patients received IA tPA with thrombectomy, while ten underwent thrombectomy alone. In the IA tPA group, nineteen TICI 3, three TICI 2b, and two TICI 0 were achieved. In the non-IA tPA group, three TICI 3, five TICI 2b, and two TICI 0 were achieved. Of the IA tPA and non-IA tPA groups, 92% and 80% were TICI 2B or 3, respectively. The median ictus to revascularization time was 290 minutes and groin puncture to revascularization was 63 minutes, with insignificant differences between both groups. The median presenting NIHSS was 20 in both groups and the median discharging NIHSS for the IA tPA and non-IA tPA groups, were 8 and 6 respectively. There was one mortality in the IA tPA group and two mortalities in the non-IA tPA cases. Also, there were four cases of post-intervention intracranial hemorrhage of varying severity in each group, with a total median ictus to revascularization time of 350 minutes.

Table 2 (Timing)

	No IA tPA	IA tPA
Ictus to Revascularization Time ( <i>Median, IQR</i> )	293 min (253-354)	298 min (235-353)
Groin Puncture to Revascularization Time ( <i>Median, IQR</i> )	59 min (46-80)	67 min (52-79)

### Conclusions

Concomitant IA tPA thrombolysis with mechanical thrombectomy is a safe and effective technique for revascularization with potentially synergistic effects. Further investigation into the efficacy of this method and optimal utilization is certainly warranted.

Table 3 (Outcomes)

	No IA tPA	IA tPA
Pre-Procedure TICI Grade (N,%)		
0	10 (100%)	24 (100%)
Post-Procedure TICI Grade (N,%)		
0	2 (20%)	2 (8%)
1	0	0
2a	0	0
2b	5 (50%)	3 (13%)
3	3 (30%)	19 (79%)
Initial NIHSS ( <i>Median, IQR</i> )	20 (14-24)	20 (17-25)
Discharge NIHSS ( <i>Median, IQR</i> )	8 (4-17)	6 (4-15)
Post-Procedural Hemorrhage (N,%)	4 (40%)	4 (17%)

### Learning Objectives

To understand the role of intra-arterial thrombolysis use during mechanical thrombectomy

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