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Mechanical Thrombectomy in Ischemic Stroke Patients with Severe Pre-stroke Disability

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Abstract

Frequency and outcomes of mechanical thrombectomy (MT) in clinical practice for patients with severe pre-stroke disability are largely unknown. In this case series, we aim to describe the disability make-up and outcomes of 33 patients with severe pre-stroke disability undergoing MT. Patients with a permanent, severe, pre-stroke disability (modified Rankin Score, mRS, 4–5) were identified from a prospectively-maintained database of consecutive, MT-treated, acute ischemic anterior circulation stroke patients at two comprehensive stroke centers in the United States. We present details on the cause of disability and socio-demographic status as well as procedural and

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DISCLOSURES

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functional outcomes. This study, despite the lack of inferential testing due to limited sample size, provides insight into demographics and outcomes of MT-treated patients with severe pre-stroke disability. Rate of return to functional baseline as well as rates of procedural success and complications were comparable to that reported in the literature for patients without any pre-existing disability.

Keywords

All Cerebrovascular disease/Stroke; Infarction; Acute Ischemic Stroke; Mechanical Thrombectomy; Disability

INTRODUCTION

We recently reported that outcomes of patients with moderate pre-stroke disability (pre-stroke modified Rankin scale score, mRS, 2–3), representing nearly 1/3rd of mechanical thrombectomy (MT) treated patients in practice, are comparable to those without pre-stroke disability.(1) Patients with severe pre-stroke disability (mRS 4–5), 6–7% of acute stroke patients,(2, 3) are often excluded from MT due to anticipated treatment futility and are majorly understudied. In this case series, we reveal make-up and outcomes of severely disabled patients treated with MT.

METHODS

We identified patients with permanent, severe, pre-stroke disability (mRS 4–5) in a prospectively-maintained database of consecutive MT patients at two comprehensive stroke centers in the United States. Primary outcome was the rate of return to pre-stroke functional baseline. The causes of permanent pre-stroke disability were categorized as: orthopedic, prior stroke, other neurological causes, frailty(4), obesity, trauma, and cardiac.

RESULTS

Of the 822 MT-treated patients with anterior circulation strokes, 33 had a permanent, severe pre-stroke disability. The baseline demographics, stroke characteristics, description of prior living situation, category of disability, and percent returning to pre-stroke disability level are presented (Table 1). Twelve patients (36.4%) returned to pre-stroke baseline status. 14 patients (42.4 %) were transitioned to comfort measures only. Eight patients (24.2%) died in-hospital. 28 patients (84.8%) had a successful recanalization and 6.2% had a symptomatic intracerebral hemorrhage.

DISCUSSION

Our study provides an understanding of disability make-up, procedural, and functional outcomes of patients with severe, permanent pre-stroke disability after MT. We found that 33/822 (4%) patients undergoing MT for anterior circulation stroke had a pre-procedure permanent severe disability. Majority (60%) of the patients resided at home prior to the presentation. Although the procedural outcomes (84% successful recanalization and 6.2%

rate of sICH) and rate of return to the baseline functional status (36%) was comparable to that reported in the literature for patients with no pre-stroke disability, no definite inferential testing can be done due to a limited number of patients.(5, 6) However, these data may provide some reassurance that MT in severely and permanently disabled patients is not exceedingly rare. This study builds on prior work(7–9) and suggests that in the acute presentation of stroke, when there is uncertainty about permanence and degree of disability, MT can still be considered as a treatment option. This study likely suffers from a selection bias towards MT on only those severely disabled patients that were initially perceived to have good outcomes by treating clinicians.

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Table 1.

Descriptive Statistics of 33 patients with severe pre-stroke disability (mRS 4–5)

Age, year, median [IQR]	75 [65, 84]
Males, n (%)	11 (33.3)
Hypertension, n (%)	27 (81.8)
Diabetes, n (%)	15 (45.5)
Atrial Fibrillation, n (%)	19 (57.6)
Antiplatelet use, n (%)	19 (57.6)
Anticoagulant use, n (%)	7 (21.2)
Dementia, n (%)	11 (33.3)
Prior Stroke, n (%)	11 (33.3)
Initial blood glucose, mg/dL, median [IQR]	114 [102, 140]
NIHSS, median [IQR]	19.00 [16, 25]
ASPECTS, median [IQR]	9 [7, 10]
Internal carotid artery occlusion	8 (24.2)
Middle cerebral artery (first segment) occlusion	20 (60.6)
Middle cerebral artery (second segment) occlusion	5 (15.2)
Successful Recanalization (mTICI = 2b, 3), n (%)	28 (84.8)
Time from symptom onset to recanalization, minutes, median [IQR]	344 [221, 488]
Received IV tPA, n (%)	8 (24.2)
Symptomatic Intracranial Hemorrhage, n (%)	2 (6.2)
Pre-Stroke Living Situation, n (%)	
Home	20 (60.6)
Inpatient Rehabilitation	1 (3.0)
Skilled Nursing Facility	12 (36.4)
Cause of Pre-stroke Disability, n (%)	
Orthopedic	11 (33.3)
Prior Stroke	5 (15.2)
Other Neurologic	6 (18.2)
Frailty	5 (15.2)
Obesity	3 (9.1)
Trauma	2 (6.1)
Cardiac	1 (3.0)
Returned to Baseline by Cause of Pre-stroke Disability, n (%)	
Orthopedic	3 (27.3)
Prior Stroke	2 (40)
Other Neurologic	1 (16.7)
Frailty	2 (40)
Obesity	2 (66.7)
Trauma	2 (100)

Cardiac	0
Total	12 (36.4)

NIHSS: National Institutes of Health Stroke Scale, ASPECT: Alberta Stroke Program Early CT; mTICI: Modified Thrombolysis in Cerebral Ischemia Score.

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