

Comparison of Stroke Cohorts Cared for by Two Different Specialties in a Practice-Based Tele-Stroke Population

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Introduction

- Stroke is a leading cause of death and disability in the U.S. with rates on the rise.¹
- Management, treatment, and prevention has traditionally been provided by neurologists, but increasingly provided by neurosurgeons, with or without surgical interventions.^{2,3}
- In acute ischemic stroke (AIS), thrombolytics such as IV rt-PA* may be used to curtail further ischemia.⁴
- Since the MERCI trial in 2008,⁵ stroke management evolved to include surgical intervention, i.e. mechanical thrombectomy (MT), with or without initial IV rt-PA.
- With MT, endovascular neurosurgeons can mechanically retrieve thrombi and efficiently reestablish blood flow to penumbra zones surrounding core infarcts.
- An increased number of candidates are undergoing MT procedures through the advent of Telestroke units which allows earlier assessment of AIS patients.⁶
- In this study, we reviewed all AIS patients who initially presented to outside hospitals (OSH) within our Thomas Jefferson University Hospital (TJUH) Telestroke network and transported via our emergency transport system.
- Our aim was to assess the management of AIS patients by neurovascular surgeons compared to neurologists and its practical implications on patients' clinical outcome.

IV rt-PA = intravenous recombinant tissue plasminogen activator; MT = mechanical thrombectomy; AIS = acute ischemic stroke; OSH = outside hospital; TJUH = Thomas Jefferson University Hospital

Study Design

Cohort:

- AIS patients managed by neurologists/neurosurgeons who presented through the telestroke (TS) hospital network (>40 regional medical institutions within PA and NJ) from 2011–2016 (n = 1,353).

Study protocol:

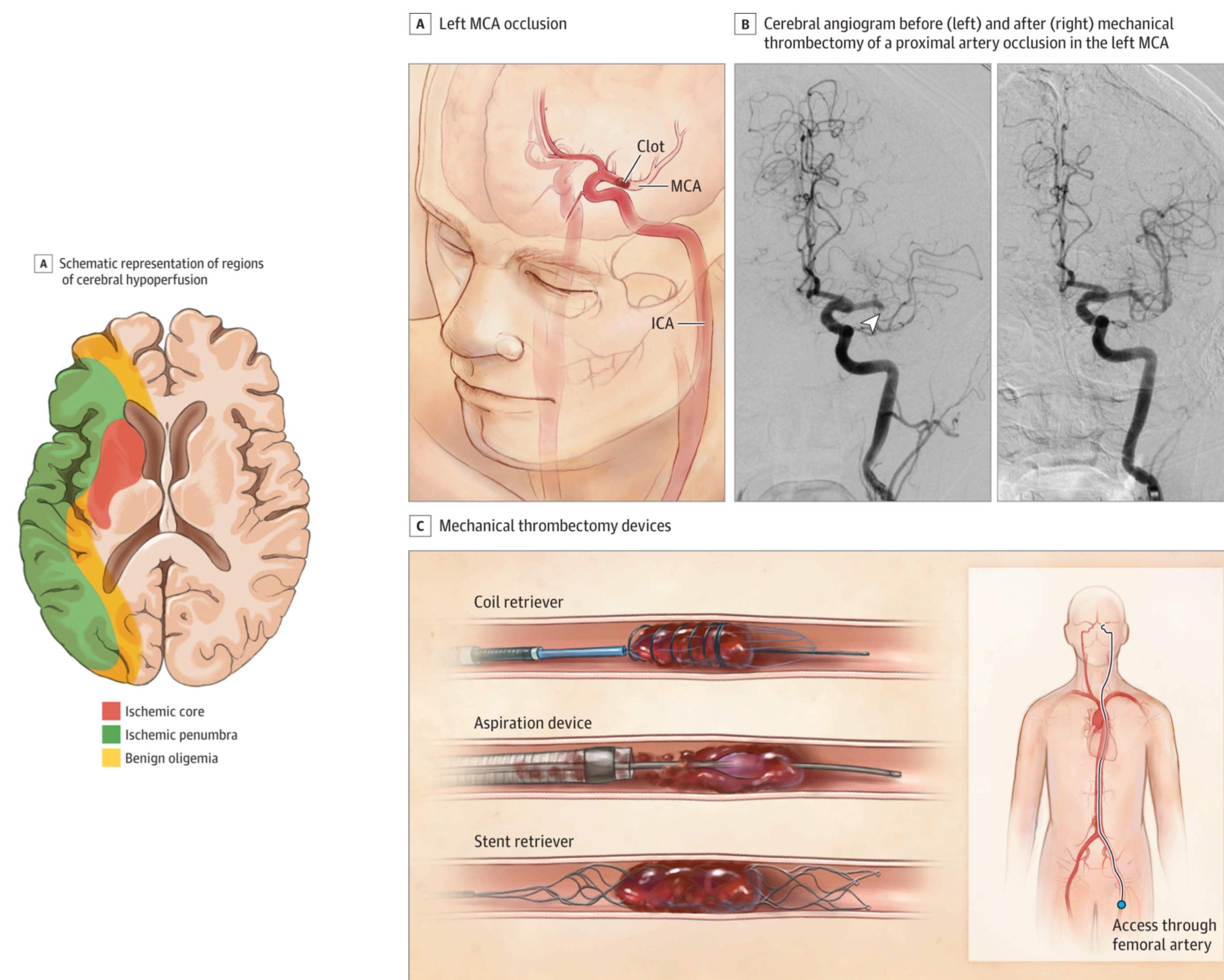
- Decision to administer IV rt-PA was determined by consulting TJUH telemedicine physician. Patients were then transferred to TJUH for further management.
- Patients received multidisciplinary care and were closely monitored by the TJUH admitting physician: Neurologist or Neurosurgeon.
- Stroke territory was recorded based on diagnostic imaging.
- Patients of NIHSS >6 who either were ineligible for IV rt-PA or did not improve after IV rt-PA were evaluated for possible MT intervention.

Outcome variables:

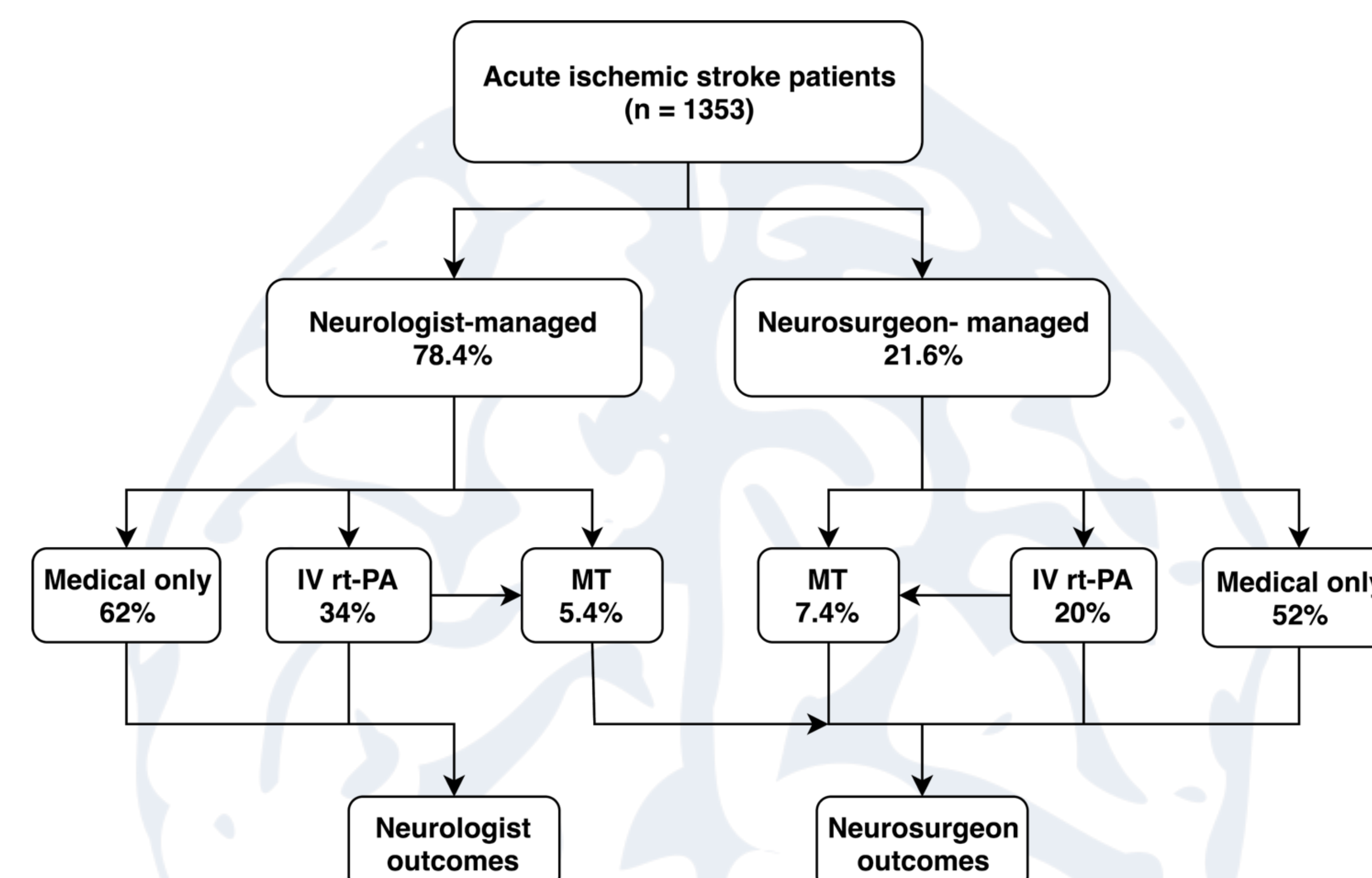
- Measured by clinical outcomes: functional outcome score, i.e. mRS (modified Rankin Score), mortality rate, and number of patients receiving MT and/or IV rt-PA.

Covariates and Comorbidities:

- Covariates used for risk adjustment were age and gender.
- The comorbidities used for risk adjustment were: hypertension, diabetes mellitus, smoking, MT, TIC1 score, recanalization device, IV rt-PA, NIHSS before treatment.



Outcomes



	Neurologist	Neurosurgeon	p-value	OR	CI 95%
NIHSS	9.0 ± 8.42	0.14 ± 0.72	-	-	-
mRS ≤ 2	57.5%	98.6%	0.873	-	-
Mortality	9.4%	8.3%	0.483	-	-
Medical	62%	52%	-	-	-
IV rt-PA	34%	20%	0.924	0.98	0.70-1.38
MT	5.4%	7.4%	0.464	1.22	0.971-2.09

Discussion

- Conflicting results in literature exist on whether neurologists are more likely to administer IV rt-PA compared to other specialties.⁷
- In our retrospective telestroke study, we found no significant difference between the two physician groups in IV rt-PA administration (OR, 0.98; CI95%, 0.70-1.38; p=0.924), with neurologist-managed 34% (273/1137) and neurosurgeon-managed 20% (43/216).
- Referrals by neurologists or neurovascular surgeons for MT were comparable (5.3% vs. 7.4% respectively) (OR 1.22; CI95%, 0.971-2.09; p=0.464).
- 58% of neurologist-managed AIS patients had mRS<2 compared to 99% of neurosurgeon-managed AIS patients, likely due to the efficacy of MT in treating AIS.
- There was no difference in mRS nor mortality (p=0.873 and p=0.483 respectively), with similar clinical outcomes and hospital course (management and treatment).

LIMITATIONS

- Our design is limited by retrospective nature of this study.
- Further studies are warranted to confirm these observations, to determine standards of care delivered by a highly-specialized stroke unit and prominence of multidisciplinary care in this disabling disease.

Conclusion

- Telemedicine is allowing for more patients suffering from AIS to receive care by dedicated stroke physicians including neurovascular surgeons.
- Our study does not find any difference in outcome between neurologists, who have traditionally managed stroke care, and neurosurgeons.
- Although ischemic stroke is a matter of multidisciplinary management, these surgeons are appropriately knowledgeable to prescribing IVrt-PA and concurrently performing MT in a highly-specialized stroke unit.

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Images:

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