Disputes & Debates: Editors' Choice

Editors' Note: Association of Initial Imaging Modality and Futile Recanalization After Thrombectomy

In "Association of Initial Imaging Modality and Futile Recanalization After Thrombectomy," Meinel et al. reported that the rate of futile recanalization (defined as 90-day modified Rankin Scale (mRS) score 4–6 despite successful recanalization) among patients enrolled in the BEYOND-SWIFT multicenter, retrospective observational registry was significantly higher in patients selected for thrombectomy based on a CT scan as compared with patients selected for thrombectomy based on an MRI. Siegler and Thon cautioned that these findings should not dissuade against (1) use of a CT scan to determine eligibility for thrombectomy because this could lead to unnecessary delays in care or (2) performance of thrombectomy after CT scans because the imaging modality itself does not directly affect outcome and 40% of patients selected for thrombectomy based on a CT scan had a good 90-day mRS score (which represents a 22%–27% absolute increase compared with patients treated with medical management in the DAWN and DEFUSE-3 trials). Meinel et al agreed that it is imperative to avoid delays before thrombectomy and reinforced that their findings should not influence the selection of imaging modality for potential thrombectomy candidates. They also pointed out that implementation of high-speed MRI protocols should be considered to obtain more detailed information than a CT scan can provide while avoiding lengthy delays between imaging and groin puncture.

Ariane Lewis, MD, and Steven Galetta, MD
Neurology® 2021;96:915. doi:10.1212/WNL.0000000000011904

Reader Response: Association of Initial Imaging Modality and Futile Recanalization After Thrombectomy

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Neurology® 2021;96:915–916. doi:10.1212/WNL.0000000000011898

We read with interest the results of the BEYOND-SWIFT retrospective observational registry by Meinel et al.[1] Determination of candidacy for acute stroke intervention is a rapidly evolving and highly controversial field because we have seen in recently published trials, which are expanding eligibility criteria.

We would respectfully caution the authors to avoid using language such as "there is a need to reduce [futile recanalization]" in the opening of their article and to reiterate it verbatim in the Discussion because these are misleading proclamations. Certainly, it remains a priority among all clinicians to provide cost-effective care with the aim of improving functional outcomes and/or satisfying end-of-life preferences. However, to leverage "futile recanalization" to justify whether CT or MRI-based modalities be used in selecting thrombectomy candidates will undoubtedly bias clinicians in their imaging recommendations (leading to delays in care, as the investigators have shown). It may also falsely influence a clinician's determination of thrombectomy eligibility. To conclude that CT-based selection of thrombectomy candidates results in a higher rate of futile

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thrombectomy when compared with MRI-based methods (although accurate) is inherently misleading. We do not question the effect of imaging modality on treatment-related outcome. However, even among CT-based selection of patients from BEYOND-SWIFT, 40% of patients achieved functional independence by 90 days. This is a marginal 5%–9% decrement from what was observed in DAWN[2] and DEFUSE-3,[3] and (more importantly) a 22%–27% absolute increase in the rate of functional achievement of these patients when compared to medically managed controls from these trials.

To suggest that these patients are "futile recanalizers" is a misrepresentation and decontextualization of the data. Such claims could impede the care of many treatment responders, potentially growing the number of disabled stroke survivors or even resulting in medicolegal consequences for clinicians who justify treatment deferral based on these findings. It is worthwhile to consider CT versus MRI in predicting the long-term outcome after thrombectomy, but knowing that time is a critical determinant of functional outcomes in treated large vessel occlusion[4] should encourage clinicians to rely on the quickest imaging assessment—in this case, CT.

1. Meinel TR, Kaesmacher J, Mosimann PJ, et al. Association of initial imaging modality and futile recanalization after thrombectomy. Neurology 2020;95:e2331–e2342.
2. Nogueira RG, Jadhav AP, Haussen DC, et al. Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. N Engl J Med 2018;378:11–21.
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4. Jahan R, Saver JL, Schwamm LH, et al. Association between time to treatment with endovascular reperfusion therapy and outcomes in patients with acute ischemic stroke treated in clinical practice. JAMA 2019;322:252–263.

Author Response: Association of Initial Imaging Modality and Futile Recanalization After Thrombectomy

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Neurology® 2021;96:916–917. doi:10.1212/WNL.0000000000011900

We thank the authors for their comment in response to our article.[1] In their letter, they point out an important issue, namely, the questionable term "futile intervention." This term has been used as successful recanalization despite an unfavorable outcome at 3 months.[2,3] However, the definition of an unfavorable outcome has varied, and patient and caregiver perspectives are quite heterogeneous regarding what to consider an unfavorable outcome.

We fully agree with the authors that time delays seen in MR imaging are to be avoided and further efforts are necessary to close the gap in the onset-to-groin time between CT and MRI patients. Given the vast amount of high-speed MRI protocols published, this seems feasible. However, we do not agree that our article suggests that we generally favor MRI over CT for suspected thrombectomy candidates. In fact, we did question the effect of the imaging modality on the overall outcome, stating that "the main aim of this study was to sensitize stroke physicians that apparently the imaging modality influences their decisions regarding which patients to treat by MT. Whether this results in an overall better, worse, or equal outcome can only be judged by upcoming RCTs on this issue."

Furthermore, we do not think that it is appropriate to compare the results of this cohort including early time-window patients to the DAWN and DEFUSE-3 population. Neither did we call only CT patients as "futile recanalizers." Rather, we considered both MRI and CT patients that had a modified Rankin Scale of 4–6 at 3 months with a sensitivity analysis

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considering only mRS 5–6 at 3 months as futile. This was done because there may be a higher consensus among physicians and also patients that mRS 5–6 despite successful reperfusion constitutes a futile treatment (5-Year QUALE 0.05).[4] Given the fact that current guidelines judge MRI and CT equivalent,[5] we doubt that an established MRI workflow will lead to medicolegal consequences.

We fully agree that time delays should be avoided and a potentially life-saving treatment should be offered to any patient fulfilling criteria for endovascular stroke treatment. Clinicians should be aware that the initial imaging modality might affect their treatment decisions. Whether MR imaging as compared with CT imaging leads to over-selection and time delays or that it harbors the potential to reduce futile interventions without over-excluding patients can only be evaluated in upcoming randomized controlled trials. Until then, our study should not influence clinicians to change the imaging modality for suspected thrombectomy candidates.

1. Meinel TR, Kaesmacher J, Mosimann PJ, et al. Association of initial imaging modality and futile recanalization after thrombectomy. Neurology 2020;95:e2331–e2342.
2. Espinosa de Rueda M, Parrilla G, Manzano-Fernández S, et al. Combined multimodal computed tomography score correlates with futile recanalization after thrombectomy in patients with acute stroke. Stroke 2015;46:2517–2522.
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Editors' Note: Comparison of Ice Pack Test and Single-Fiber EMG Diagnostic Accuracy in Patients Referred for Myasthenic Ptosis

In "Comparison of Ice Pack Test and Single-Fiber EMG Diagnostic Accuracy in Patients Referred for Myasthenic Ptosis," Giannoccaro et al. compared the diagnostic accuracy of the ice pack test (IPT) with single-fiber EMG (SF-EMG) on the orbicularis oculi muscle in 155 patients, with ptosis being evaluated for ocular myasthenia defined as a positive response to the edrophonium test, presence of acetylcholine-receptor antibodies, a decrement of >10% of the third to fifth compound muscle action potential after repetitive nerve stimulation, or unequivocal response to oral steroids or acetylcholinesterase inhibitors for at least 3 months. They found that the IPT and SF-EMG had similar diagnostic accuracy in this patient population. Silvestri noted interest that (1) the IPT, a simple and cheap bedside assessment, is comparable with a complicated test like the SF-EMG; (2) the results of the IPT and SF-EMG were discordant for 10% of subjects (mostly in the setting of mild or isolated ptosis); and (3) the utility of the IPT was not evaluated in patients with isolated diplopia. Giannoccaro and Liguori responded that the discordance in results generally occurred in the setting of a negative IPT, which may be related to the lack of repetition of the test. They also cited previously published data that the IPT is useful in patients with isolated diplopia, particularly because SF-EMG may be negative in these patients.

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Neurology® 2021;96:917. doi:10.1212/WNL.0000000000011905

Author disclosures are available upon request (journal@neurology.org).

Reader Response: Comparison of Ice Pack Test and Single-Fiber EMG Diagnostic Accuracy in Patients Referred for Myasthenic Ptosis

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Neurology® 2021;96:918. doi:10.1212/WNL.0000000000011901

Giannoccaro et al.[1] reported their findings on the sensitivity and specificity of the ice pack test and single-fiber electromyography (SF-EMG) in the diagnosis of ocular myasthenia gravis. It is interesting—and perhaps humbling—that such a straightforward test as cooling muscle with ice has very similar diagnostic accuracy compared with a technically complex and sophisticated test as SF-EMG in patients presenting with eyelid ptosis. These findings are largely in line with previous research evaluating the positive and negative predictive values of the ice pack test in ocular myasthenia gravis.[2-5]

One concern is the discordance in the results of the 2 tests in 10% of the study participants, although this occurred more often in cases of mild and isolated ptosis. Another limitation is that the authors did not assess the utility of the ice pack test in patients with isolated diplopia, a fairly common clinical manifestation in those ultimately diagnosed with ocular myasthenia.

Overall, the results of this study are encouraging given the simplicity of the ice pack test and a relatively limited availability of SF-EMG, and they highlight the continued importance of the physical examination in neurologic diagnosis in an age of extensive and often "shotgun" approach to diagnostic testing.

1. Giannoccaro MP, Paolucci M, Zenesini C, et al. Comparison of ice pack test and single-fiber EMG diagnostic accuracy in patients referred for myasthenic ptosis. Neurology 2020;95:e1800–e1806.
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Author Response: Comparison of Ice Pack Test and Single-Fiber EMG Diagnostic Accuracy in Patients Referred for Myasthenic Ptosis

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Neurology® 2021;96:918–919. doi:10.1212/WNL.0000000000011902

We thank Dr. Silvestri for the comment on our article[1] and agree that a relatively high proportion of patients showed discordant results between the ice pack test and single-fiber electromyography (SF-EMG) because they were observed in 15% of patients with a final diagnosis of ocular myasthenia (OM). Most of discordant cases were related to the negativity of the ice pack test in the presence of an altered SF-EMG result. One explanation could be the lack of repetition of the ice pack test, as we outlined in the discussion. Indeed, a previous study showed that repeated ice pack tests improved sensitivity by 34.6% compared with a single test.[2] We also found that the repetition of the ice pack test in some patients increased its sensitivity and, therefore, the number of patients showing concordant results (unpublished data).

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We also acknowledged that we did not investigate the usefulness of the ice pack test in patients with isolated diplopia. Nevertheless, Chatzistefanou et al.[3] reported a sensitivity of 76.9% and a specificity of 98.3%, suggesting that the ice pack test is similarly useful in the assessment of myasthenic diplopia. This could be particularly relevant because we showed that diagnostic tests for OM—including SF-EMG—are frequently negative in patients with this clinical presentation.[4]

1. Giannoccaro MP, Paolucci M, Zenesini C, et al. Comparison of ice pack test and single-fiber EMG diagnostic accuracy in patients referred for myasthenic ptosis. Neurology 2020;95:e1800–e1806.
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CORRECTIONS

Lesion Evolution and Neurodegeneration in RVCL-S

A Monogenic Microvasculopathy

Neurology® 2021;96:919. doi:10.1212/WNL.0000000000011323

In the article "Lesion Evolution and Neurodegeneration in RVCL-S: A Monogenic Microvasculopathy" by Ford et al.,[1] the following sentence was omitted from the Study Funding statement: "This work was supported by Clayco Foundation, Energy 4A Cure Foundation, Cure CRV Research and The Foundation for Barnes Jewish Hospital (MB, MKL, DH, JJM, JPA)." The authors regret the omission.

Reference

1. Ford AL, Chin VW, Fellah S, et al. Lesion evolution and neurodegeneration in RVCL-S: a monogenic microvasculopathy. Neurology 2020;95:e1918–e1931.

Apathy and Risk of Probable Incident Dementia Among Community-Dwelling Older Adults

Neurology® 2021;96:919. doi:10.1212/WNL.0000000000011756

In the article "Apathy and Risk of Probable Incident Dementia Among Community-Dwelling Older Adults" by Bock et al.,[1] the Study Funding should read: "This research was supported by National Institute on Aging (NIA) Contracts N01-AG-6-2101; N01-AG-6-2103; N01-AG-6-2106; NIA grant R01-AG028050, and NINR grant R01-NR012459. This research was funded in part by the Intramural Research Program of the NIH, National Institute on Aging. It is also supported through NIA K24 AG-31155." The authors regret the omission.

Reference

1. Bock MA, Bahorik A, Brenowitz WD, Yaffe K. Apathy and risk of probable incident dementia among community-dwelling older adults. Neurology 2020;95:e3280–e3287.

Author disclosures are available upon request (journal@neurology.org).

Neurology

Lesion Evolution and Neurodegeneration in RVCL-S: A Monogenic Microvasculopathy

Neurology 2021;96;919 Published Online before print December 4, 2020
DOI 10.1212/WNL.0000000000011323

This information is current as of December 4, 2020

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