



Response to: Workup following retinal artery occlusion—experience from an outpatient retina clinic and the delay in workup

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Dear Editor,

We read the response by Kishore et al. to our manuscript: Workup Following Retinal Artery Occlusion-Experience from an Outpatient Retina Clinic and the Delay in Workup. One of the goals of our paper was to foster discussion among providers on management strategies in light of recent guidelines [1]. Though we acknowledge their comments, we disagree on several points.

The diagnosis of an acute central retinal artery occlusion (CRAO) represents not only a sight threatening emergency but also portends significant cardiovascular and cerebrovascular risks [2]. As alluded to by Kishore et al., our study showed it may be possible to complete a thromboembolic workup on an outpatient basis. However, our conclusion was that on average, there was a statistically significant delay in obtaining this workup through an outpatient route vs. an emergency department (ED) (13.6 vs. 2.20 days ($p=0.003$)). This delay may have been due to several factors, among them accessibility to specialty care, lack of communication between providers, and inadequacy in conveying the urgent nature of the condition to patients. Inaccessibility to specialty outpatient providers has only been compounded during the ongoing COVID-19 pandemic, creating a further barrier to urgent care. The recognition of this delay is crucial in understanding potential morbidity and mortality risks in this cohort. In a study, Park et. al., of 1585 patients with an acute CRAO, 165 (10.4%) had a stroke or acute myocardial event within 1 year of diagnosis [3]. Notably, the incident rate ratio (IRR) was highest in the first seven days (44.51; 95% CI, 27.07–73.20). This increased risk continued into the first 30 days after the CRAO diagnosis. This large retrospective study demonstrates the timing of workup is

extremely valuable in potentially preventing these devastating complications.

If a patient's carotid imaging workup is found to be causative, timing is also essential in receiving interventional treatment in addition to medical management as Kishore et al. had outlined. Guidelines from the AHA and American Society for Vascular Surgery recommend that carotid endarterectomy be performed within 14 days from the original ischemic event, further illustrating how a delay in obtaining imaging workup may push a patient out of this critical time window [4].

Kishore et al. has suggested that only patients within a 4.5 hour window of visual symptoms be sent to an ED for consideration of tissue plasminogen activator (TPA). The administration of TPA for CRAO has shown varied outcomes, with few studies reporting a visual benefit [5]. However, aside from the 2010 EAGLE study that did not reveal a visual acuity improvement in patients receiving intra-arterial TPA vs. a placebo group, no randomized prospective control trials have demonstrated improved visual outcomes using this approach. Furthermore, access to centers able to administer local intravenous or intraarterial TPA for acute CRAO through a designated protocol outside of academic centers remains limited. Therefore, we believe the benefit in referring patients to an emergency department immediately lies in secondary prevention of future ischemic events, rather than primary visual recovery.

In our original study discussion, we referenced a 2013 survey of 281 retina specialists in which 82% indicated he or she would pursue an outpatient imaging workup for an acute RAO. However, this management paradigm has since markedly changed. In a 2021 Preferences and Trends (PAT) survey by the American Society of Retina Specialists, among 990 participants, 74.1% of US and 60.7% of international retina specialists, respectively, would refer a patient to an emergency department with an associated stroke center when a patient presents with an acute symptomatic CRAO with an embolus visible at the optic nerve head. We are

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encouraged by this trend and agree with this management based on our findings and the current literature.

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