

Central Retinal Artery Occlusion on Computed Tomography

Sunny Chi Lik Au[†]

Introduction

Central retinal artery occlusion (CRAO) is a blinding disease caused by the sudden blockage of the central retinal artery [1]. Subsequent retinal hypoperfusion causes rapid progressive cellular damage [2]. In modern emergency medicine practice, multiple centers already adopted neuroimaging scanning stroke protocols. Many patients with CRAO actually undergo Computed Tomography (CT) Figure 1 and even Computed Tomography angiography (CTA) in the search for embolism, which is the commonest cause of CRAO stroke [3]. Besides, CT also helps to

rule out intracranial hemorrhage and determine if the patient is a candidate for thrombolytic therapy. Cholesterol, calcium, and platelet-fibrin emboli are 3 main types of emboli found in CRAO [4]. Both cholesterol and platelet-fibrin emboli typically arise from atheromas in the carotid arteries. Calcium emboli typically arise from cardiac valves. Spectral detector CT is a technology that uses two layers of detectors to simultaneously collect low and high energy data [5]. It can accurately differentiate blood from iodinated contrast Figure 2 and Figure 3, thus applicable in cardiovascular diseases and CRAO [6].

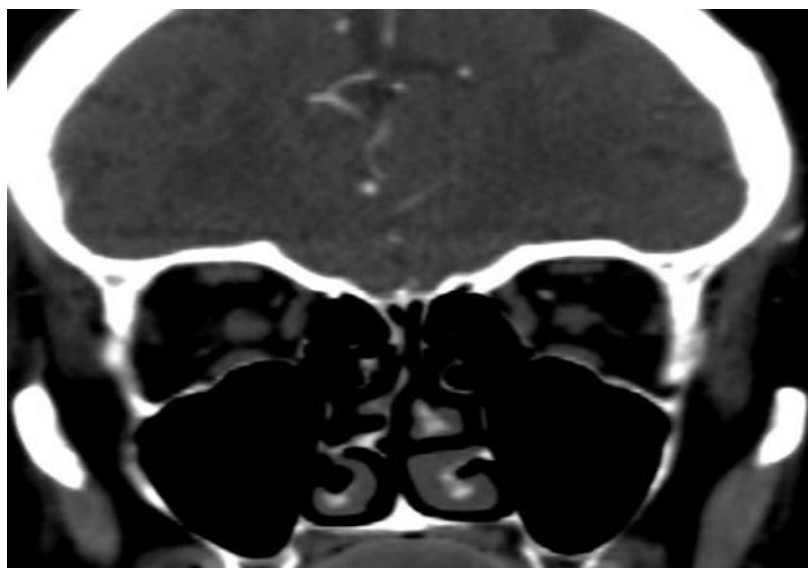


Figure 1: The coronal reformatted image of the Computed Tomography angiography of a central retinal artery occlusion patient.

Department of Ophthalmology, Tung Wah Eastern Hospital, Hong Kong

[†]Author for correspondence: Sunny Chi Lik Au, Department of Ophthalmology, Tung Wah Eastern Hospital, Hong Kong, Cell: (852) 2162 6909, Email: kilihcua@gmail.com

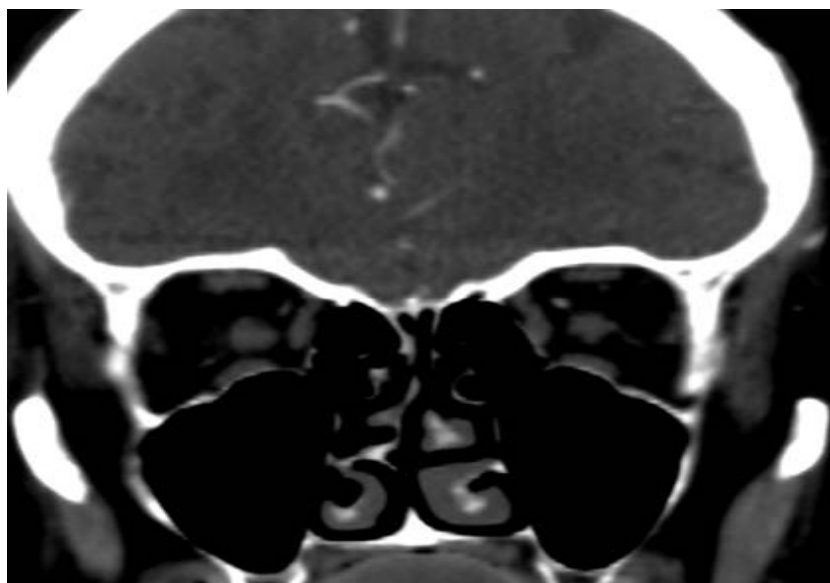


Figure 2: Iodine density spectral output of the same image of Figure 1. Blue arrow pointing to the right optic nerve showed no iodine, yet the red arrow pointing to the left optic nerve showed presence of iodine.

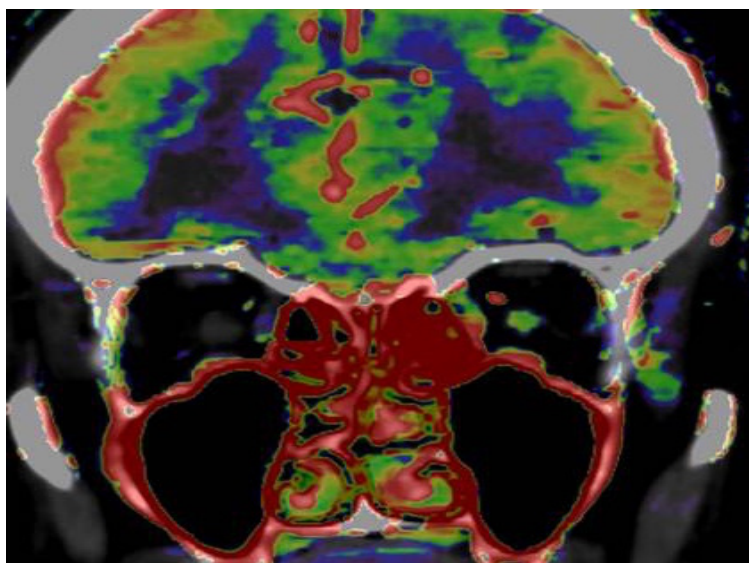


Figure 3: Fused iodine density over conventional image.

References

1. Au SCL. Acute blindness by central retinal artery occlusion. *Vis J Emerg Med* 21, 100807 (2020).
2. Au SCL, Ko CKL. Delayed hospital presentation of acute central retinal artery occlusion during the COVID-19 crisis: The HORA study brief report No. 4. *Indian J Ophthalmol* 69, 2904-2905 (2021).
3. Au SCL. The Hyperbaric Oxygen Therapy Protocol in Acute Central Retinal Artery Occlusion Seen within 24 Hours at a Tertiary Institution. *J Stroke Cerebrovasc Dis* 30, 106044 (2021).
4. Varma DD, Cugati S, Lee AW, Chen CS. A review of central retinal artery occlusion: clinical presentation and management. *Eye (Lond)*. 27, 688-697 (2013).
5. Rajiah P, Abbara S, Halliburton SS. Spectral detector CT for cardiovascular applications. *Diagn Interv Radiol* 23, 187-193 (2017).
6. Van Hedent S, Hokamp NG, Laukamp KR, Buls N, Kessner R, et al. Differentiation of Hemorrhage from Iodine Using Spectral Detector CT: A Phantom Study. *AJNR Am J Neuroradiol* 39, 2205-2210 (2018).