

Bilateral central retinal artery occlusion: Endovenous and intra-arterial thrombolysis in a patient with a subsequent diagnosis of antiphospholipid antibody syndrome

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Central retinal artery occlusion (CRAO) represents an ophthalmologic emergency given its repercussion on patient's final visual acuity (>90% retain a permanent loss of visual function).^[1] Its incidence may be underestimated given that reports are mostly done in III level hospitals or higher, estimated at 8.5 per 100,000 people.^[2] The risk of bilateral presentation is still uncommon, and is approximately 1-2% of the cases.^[2]

Medical evidence regarding the effectiveness of fibrinolytic therapy versus noninvasive therapy is still a debate due to controversial results. However, there are promising outcomes in regard to timely use of intra-arterial fibrinolysis with a range of efficacy between 16 and 100%. This variety is given by the difference in patient's characteristics and treatment modalities.^[2]

The following workup is about bilateral CRAO in the context of autoimmunity, which exposes the clinical features and challenges in regard to its treatment.

A 78-year-old male with a medical history of central retinal artery occlusion in the left eye (OS), non-Hodgkin's lymphoma in remission, and type II diabetes mellitus, presented with 3 h (start 8:00 h) evolution of sudden vision loss in the right eye (OD) with no other associated symptomatology.

Ophthalmic examination demonstrated a best-corrected visual acuity (BCVA) of 20/400 OD and hand motion OS.

Pupillary response, intraocular pressure, and anterior segment exam were unremarkable. Dilated fundus examination OD [Fig. 1] revealed pale nerve, generalized vascular attenuation with no perfusion of the cilioretinal artery, and pale macula. These findings were compatible with CRAO so the patient, since there was no availability of fluorescein angiography in the institution to support the diagnosis, was referred to the neurology department which rapidly established a peripheral intravenous line, check-in for contraindications to thrombolysis, and started bridge therapy with alteplase (start 11:24 h), the patient was constantly monitored during the intervention, with no deterioration of his vital signs. Additionally, interventional radiology considered the need for intra-arterial thrombolysis with alteplase 21 mg (start 12:20 h). Minutes before the procedure, he presented a sudden deterioration of visual acuity to no light perception (NLP) that might have corresponded to transient CRAO or secondary to the previous procedure itself. Endovascular therapy was performed within 52 min without complications. Once finished, the patient had a BCVA of counting fingers at 30 cm OD; 6:45 h after therapy, he progressed to 20/800-1, and finally 20/70 24 h after the procedure.

Due to his medical history, the patient underwent a complete cardiovascular, inflammatory, and neoplastic workup [Table 1] with no significant results. However, dual antiplatelet therapy was started with acetylsalicylic acid (ASA) 100 mg and clopidogrel 75 mg daily. Normal glycemic control was found at presentation and during follow-up.

Fundoscopy findings immediately after thrombolysis showed a fully perfused macula with mild edema [Fig. 2], for which management with topical Prednisolone 1% every 8 h and bromfenac 0.09%, one drop every 12 h in OD, was added.

After discharge, the patient consulted 4 days later due to 50 min of sudden vision loss (NLP) in OD (start at 19:09 h). Endovascular neurosurgery was decided to perform new intra-arterial thrombolysis (start at 23:00 h), with recombinant tissue plasminogen activator (rtPA) at a 20 mg dose [Videoclip 1].

No complications occurred with complete reperfusion [Videoclip 2] and the patient presented a mild improvement of vision OD with BCVA of counting fingers immediately after the procedure. Dilated fundus examination OD revealed greater macular edema, so boluses of methylprednisolone 1 g intravenous (IV) were added to the topic of anti-inflammatory treatment.

New studies were performed showing a positive cardiolipin IgG (80.7) highly suspicious of antiphospholipid syndrome so

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low molecular weight heparin at full dose was started as bridge anticoagulation therapy for warfarin.

Discussion

Central retinal artery occlusion is considered a stroke equivalent, given its pathophysiology.^[3] Its etiology is usually thromboembolic, however, vasculitis and hypercoagulability should be studied.^[3,4]

Currently, the management consists of performing intravenous fibrinolysis with alteplase, since it allows restoring

retinal blood flow by dissolving thrombi.^[2,3] However, the intra-arterial therapy is being studied as an alternative treatment.^[3] A prospective multicenter randomized study in patients aged 18 to 75 years with CRAO compared standard conservative treatment with local intra-arterial fibrinolysis using recombinant tPA.^[2] They found similar visual results with more adverse effects in the local intra-arterial fibrinolysis group. However, the time of evolution of symptoms, as an inclusion criterion, was higher than 6 h. We showed timely management, performing endovenous, and subsequently, intra-arterial thrombolysis within 3 h and 35 min, showing significant improvement in BCVA. Although there are controversies about the effectiveness of the treatment of CRAO, the AHA guidelines^[4] recommend intravenous fibrinolysis as the first line of treatment and in cases where the latter is contraindicated, management with intra-arterial fibrinolysis is recommended.

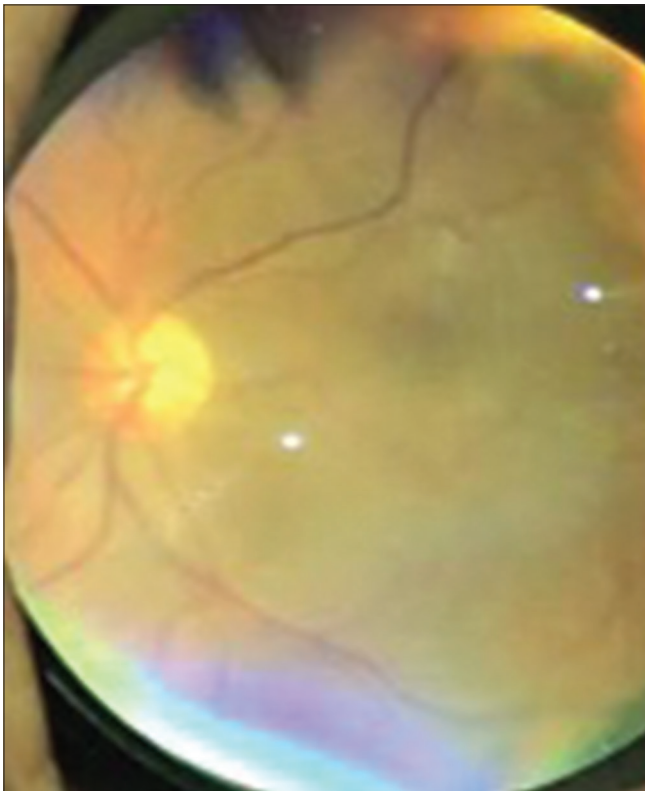


Figure 1: Right fundus examination on admission during the initial evaluation in the emergency department. Pale nerve, with generalized vascular attenuation, pale macula, pale peripheral mid retina, and the peripheral mid retina without lesions



Figure 2: Fundoscopy OD after first thrombolysis. Reperfused macula with mild macular edema

Table 1: Laboratory work up results

Laboratories

Complete cell count,	Mild leucopenia
Lipid profile, renal function, glycemic tests	Normal range
Coagulation tests	Normal range
Ferritin	High
CT angiogram of vessels of the brain and neck	Atheromatosis of both carotid bulbs with stenosis less than 30%. Calcified atheromatosis of the intracranial segments of the internal carotid arteries.
Upper Abdomen ultrasound	Mild hepatic steatosis, splenomegaly
CT scan of the neck with contrast	Internal carotid artery tortuosity
CT scan of the chest with contrast	Mild pulmonary hypertension
CT scan of the abdomen with contrast	Changes due to liver cirrhosis
Venous Doppler of lower limbs and pelvis vessels	Negative for superficial and deep venous thrombosis. Negative.
Transesophageal echocardiography	Mild mitral insufficiency, global left ventricular hypertrophy

It is noteworthy that many studies have reported a higher recanalization rate with intra-arterial fibrinolysis compared to intravenous for cerebral infarction, with non-inferiority in terms of bleeding rate.^[5-7] In our patient, the efficacy and safety of treatment were demonstrated given the considerable improvement in VA (from NPL to 20/70) as in fundus findings. However, the poor final visual outcomes (finger-count VA) may be related to recurrence of the event secondary to a lack of diagnosis leading to an increase in the area of ischemia. Also, to note, our patient did not present hemorrhagic complications.

It is necessary to highlight that the management of these patients should be multidisciplinary, especially in this case, in which the patient had a previous CRAO as well as a history of oncology and a state of recent diagnosis of hypercoagulability. A review of the literature shows that up to half of the patients with the antiphospholipid syndrome may have decreased visual acuity.^[8] Also, when it is a secondary antiphospholipid syndrome, arterial occlusion becomes more common.^[8] In our case, there was a delay at the time of the diagnosis of the cause of CRAO, therefore, limiting the effective treatment leading to recurrence and no final improvement in BCVA.

In conclusion, few cases have been reported with the presence of bilateral and recurrent central retinal artery occlusion and a history of antiphospholipid syndrome.^[9] There is still doubt regarding the choice of intervention, however, we demonstrated an accurate visual outcome with intravenous and subsequent intra-arterial thrombolysis.

Authorship

All authors had read and approved the manuscript and all of them attest that they meet the current ICMJE criteria for Authorship.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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