

Letter to the Editor

Systemic intravenous abciximab: a novel treatment for acute central retinal artery occlusion?

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Editor,

We report the case of an 80-year-old Caucasian male, with medical history of several episodes of transient ischemic attack between January and September 2016. Investigation with carotid ultrasound revealed fibrous atheromatous plaque in both internal carotid arteries with severe stenosis on the left. The patient was proposed for left internal carotid angioplasty and stenting (CAS) and started on clopidogrel (75 mg/day) and acetylsalicylic acid (100 mg/day) one week before the procedure. His medical record was also remarkable for arterial hypertension, dyslipidemia, gallstones and sigmoidal adenocarcinoma (submitted to surgery in 2008).

After an uneventful CAS procedure, the guiding catheter was removed, and a closure device was placed on the femoral puncture site. At that time, the patient complained of complete visual loss in his left eye. Five minutes later, ophthalmic examination of the left eye revealed visual acuity (VA) of light perception, absolute afferent pupillary defect and indirect ophthalmoscopy showed the presence of a white thrombus in central retinal artery inferior branch. The patient immediately received 10 mg of abciximab bolus in saline solution at 84 ml/hr and 500 mg of acetazolamide. Vigorous eyeball massage was also performed. Ten minutes later, he started a continuous infusion of abciximab adjusted to his weight (3.75 ml in 50 ml of saline solution at 3.8 ml/hr). As he was hemodynamically unstable (blood pressure of 90/60 mmHg), he could not be

transported to another hospital to start hyperbaric chamber therapy. Forty-five minutes after the initial complaint, the patient claimed, and he had recovered his vision. In fact, at that moment, VA was counting fingers and indirect ophthalmoscopy disclosed any vascular occlusion, and the retina had normal colour. Two weeks later, his left eye corrected distance VA in Snellen scale was 10/10 (−2) with +0.50 + 2.00 @ 180°, equal to those measured 26 months before; fluorescein angiography revealed no signs of vascular disease, emboli or ischemia; and optical coherence tomography (OCT) (macula, optical disc, temporal and nasal superior and inferior branches and surrounding areas distancing until 2 mm) was normal.

Central retina artery occlusion (CRAO) is an ocular emergency, and actually there are no clinical trials to determine if any treatment is effective (Hedges et al. 2016). Conservative therapies include: ocular massage and/or anterior chamber paracentesis in order to increase retinal perfusion; carbonic anhydrase inhibitors, hyperosmotic diuretics, topical sympathomimetic or beta-adrenergic blocking agents to reduce intraocular pressure; and hyperbaric oxygen to improve oxygen delivery. In its updated review, Hedges et al. also claimed that conservative therapies were considered futile. Nevertheless, Stefánsson et al. (1985) reported a case of massive embolus of central retinal artery, treated with anterior chamber paracentesis and coughing, that resulted in restoration of retinal blood flow; however, in this case afferent pupillary defect remained present and angiography revealed occlusion of the inferior temporal arteriole with local retinal oedema. More recently, another successful conservative treatment of a likely central retinal artery thromboembolism after internal carotid artery aneurysm coil occlusion was reported; however, in this case authors reported that multiple small emboli could be seen within the peripheral branches of the retina. Moreover, both afferent pupillary defect and post-treatment angiography findings were not described (Duxbury et al. 2014).

Systemic intravenous and local intra-arterial fibrinolytic therapies are now considered valid in many cases, despite controversial (Schrag et al. 2015; Page et al. 2016). As the patient was hemodynamically unstable, and the femoral access has already been closed with the Angio-Seal closure device, systemic abciximab was administered (Barreto 2012).

Abciximab was the first glycoprotein IIb/IIIa inhibitor (GPI) approved by the FDA. The glycoprotein IIb/IIIa integrin receptor is the pivotal mediator of platelet aggregation, becoming abundant on the platelet surface when platelets are activated. In late 1990s, the introduction of GPI was associated with reduction of ischemic complication and clinical benefit in percutaneous coronary interventions. Abciximab is a genetically engineered, recombinant, monoclonal antibody Fab fragment. The binding of abciximab to the platelet prevents the interaction with other adhesive protein molecules (Usta et al. 2016).

The most relevant point concerning this case report is the finding that systemic intravenous abciximab may represent a novel and prompt approach in emergency room to CRAO induced by highly suspicious platelet thrombus. This is particularly relevant in centres with no neuroendovascular facilities or in patients where intra-arterial fibrinolytic therapy is not recommended. The potential effects of this approach in distal branch retinal artery occlusion (not accessed by catheter) may also be considered.

References

- Barreto AD (2012): Adjunctive and alternative approaches to current reperfusion therapy. *Stroke* **43**: 591–598.
- Duxbury O, Bhogal P, Clout G & Madigan J (2014): Successful treatment of central retinal artery thromboembolism with ocular massage and intravenous acetazolamide. *BMJ Case Rep* **2014**. [Epub ahead of print]
- Hedges T, Brazis PW, Trobe J & Wilterdink J (2016): Central and branch retinal artery occlusion. In: *UpToDate*, Post TW (Ed). Waltham, MA: UpToDate. (Accessed on 25 Nov 2016).
- Page PS, Cambon AC & James RF (2016): Visual improvement after intra-arterial thrombolysis for central retinal artery occlusion does not correlate with time to treatment. *Intervent Neurol* **5**: 131–139.
- Schrag M, Youn T, Schindler J, Kirshner H & Greer D (2015): Intravenous fibrinolytic therapy in central retinal artery occlusion. A patient-level meta-analysis. *JAMA Neurol* **72**: 1148–1154.
- Stefánsson E, Coin JT, Lewis WR 3rd, Belkin RN, Behar VS, Morris JJ Jr & Anderson WB Jr (1985): Central retinal artery occlusion during cardiac catheterization. *Am J Ophthalmol* **99**: 586–589.
- Usta C, Turgut NT & Bedel A (2016): How abciximab might be clinically useful. *Int J Cardiol* **222**: 1074–1078.

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