

# Visual impairment and color vision disturbances after tranexamic acid administration

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## Introduction

- Tranexamic acid (TXA) is an antifibrinolytic medication which as a lysine analog adheres to the lysine binding sites on plasminogen and subsequently blocks the breakdown of fibrin clots by plasmin<sup>1</sup>.
- It is commonly used in surgery to control bleeding, to prevent nosebleeding and heavy menstruation and to treat angioneurotic oedema.
- Maximal dosage is 3 grams per day and it needs to be adapted to renal function.

## Case presentation

A 32-year-old woman underwent a laparoscopic cholecystectomy complicated with intraoperative hemorrhage, receiving a blood transfusion and 1000 mg of intravenous tranexamic acid. Five hours after the end of the intervention, she reported a bilateral vision loss of sudden onset.

On clinical exam, visual acuity was “light perception” in both eyes and intraocular pressure was normal. Pupils were in semi-mydriasis and there was no relative afferent pupillary defect. Anterior segment and fundus exam were normal, indicating the absence of a lesion of the macula and the optic nerve. Optical coherence tomography of the macula and fundus autofluorescence were also normal (Figure 1).

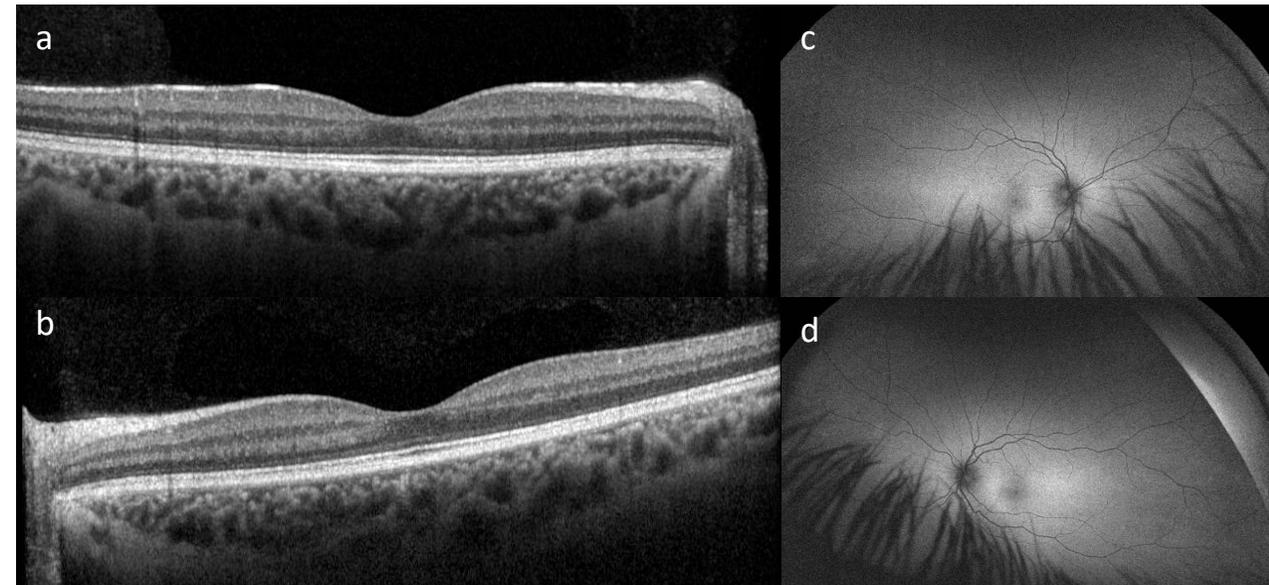


Fig. 1. Normal SD-OCT scans (a,b) and fundus autofluorescence images (c,d) from right and left eye respectively.

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## Case presentation

A computed tomography angiography of the cerebral arteries was conducted in emergency and excluded an acute stroke or any other anomaly.

On the first postoperative day, she reported a spontaneous improvement of her vision, with persistence of some unclear visual disturbances. Best corrected visual acuity (BCVA) of both eyes was 20/20 and Ishihara pseudoisochromatic plates disclosed a severe red-green dyschromatopia (only 1/12 plates correctly identified with either eye). Clinical examination was again without any abnormal findings.

In the follow-up visit on the second day, she reported having a normal vision. In both eyes BCVA was 20/20 and Ishihara pseudoisochromatic plates test was normal (12/12 plates identified with both eyes). The Roth 28-hue test performed was also normal (Figure 2), showing complete visual recovery.

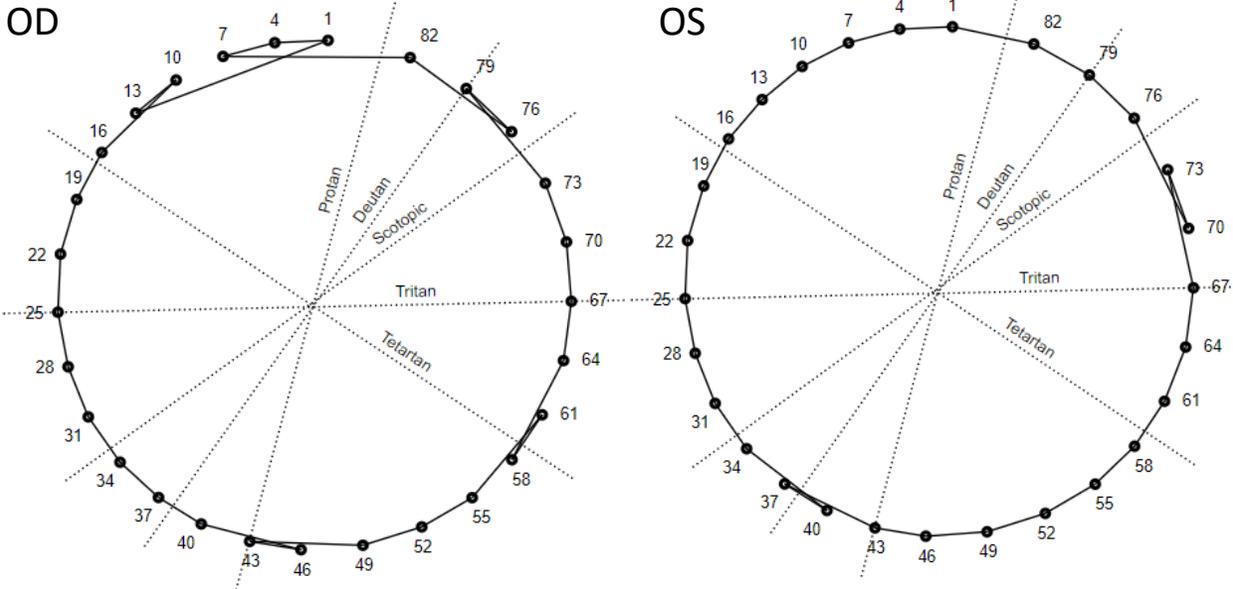


Fig. 2. Saturated Roth 28-hue test of the right (OD) and left eye (OS) the second day after the tranexamic acid administration showing normal color vision.

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## Discussion

- Animal studies have shown ocular toxicity since 1972, in dogs that received high doses of TXA and developed retinal atrophies. However, further studies in rabbits and humans receiving TXA for long periods, failed to reproduce these results<sup>2</sup>.
- TXA has been associated with vision loss due to central retinal artery or vein occlusions<sup>3</sup>.
- A few cases of visual impairment, color vision disturbances (chloropsia) and visual field restrictions have already been described after the administration of TXA<sup>4,5,6</sup>.
- In our case, a gradual recovery of visual function was observed within two days without any treatment, starting with regain of visual acuity and followed by restoration of color vision.
- It is speculated that these visual disturbances could represent a pharmacodynamic effect on one or more of the pigments involved in visual function and color differentiation by retinal cone cells<sup>6</sup>.
- A hypothetical association of interaction of TXA with retinal opsins could be supported by the fact that TXA is effective in the treatment of melasma (a pigmentary skin disorder) and the fact that dermal opsins play an important role in skin pigmentation<sup>7</sup>.
- Practitioners should be aware of this rare side-effect of a commonly used drug and discontinue it in case of any ocular symptoms.

## References

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