

Early treatment of subretinal haemorrhage in the course of exudative AMD using SF₆ gas infusion and injection of intravitreal anti-VEGF — case report

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ABSTRACT

Submacular haemorrhages, which are mostly caused by exudative age-related macular degeneration, lead to a significant deterioration of visual acuity and have a poor prognosis. Therefore, quick implementation of treatment is essential.

The aim was to report a case of 68-year-old patient suffering from extensive haemorrhage covering the macula treated with pure sulphur hexafluoride (SF₆) gas infusion and two anti-vascular endothelial growth factor (anti-VEGF) intravitreal injections. A patient was referred to the clinic due to a sudden deterioration of vision and the appearance of a black spot in central vision in the right eye. The patient underwent the infusion of 0.5 ml of pure SF₆ followed by maintenance of face-down position postoperatively resulting in partial displacement of submacular haemorrhage. One month after the surgery the patient was referred to two intravitreal injections of anti-VEGF in monthly intervals. The effectiveness of the treatment is confirmed by OCT examination and visual acuity results (from CF 1' before treatment to 5/12 after the treatment).

A combination of SF₆ gas infusion and anti-VEGF intravitreal injections turned out to be an effective and safe method of submacular haemorrhage treatment. Early diagnosis and treatment implementation resulted in significant improvement of visual acuity.

KEY WORDS: age-related macular degeneration, anti-VEGF, haemorrhage, macula, SF₆ gas

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INTRODUCTION

Exudative age-related macular degeneration (AMD) is the most common cause of submacular haemorrhage, which leads to a significant deterioration of visual acuity and has a poor prognosis [1].

Loss of vision is secondary to the toxic, degenerative activity of residual blood, which damages photoreceptors [1]; therefore, quick implementation of treatment after diagnosis is essential. Hattenbach et al. showed that the length of bleeding duration is a pre-

dictor for improved vision [2]. Patients with submacular haemorrhage lasting up to 14 days had two-fold increased chances for improved vision than patients with bleeding, which lasted from 14 to 21 days. In contrast, none of the patients whose bleeding lasted for more than 21 days obtained vision improvement.

One of the methods of submacular haemorrhage treatment is an intravitreal injection of the tissue plasminogen activator (rtPA) through the pars plana vitrectomy (PPV). This procedure allows accelera-

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tion of the lysis of blood, followed by an intravitreal injection of gas, which moves the blood from the submacular area. An alternative is the administration of sulphur hexafluoride (SF₆) gas without prior administration of the tissue plasminogen activator (rtPA) [3, 4]. As submacular haemorrhage is the result of abnormal vasculature from exudative AMD, visual stability over time is dependent on the control of the underlying disease [5, 6]. Through exposure of the macular area in the way of SF₆ gas administration, better conditions for the subsequent application of anti-vascular endothelial growth factor (anti-VEGF) are obtained to treat the choroidal neovascular membranes (CNVM) located there.

CASE DESCRIPTION

A 68-year-old patient came to the ophthalmologic emergency room due to a sudden deterioration of visual acuity and the appearance of a black spot in central vision in the right eye on the same day. The patient's treatment was conducted in accordance with the Declaration of Helsinki. Visual acuity: right eye = CF 1', left eye = 5 / 5.5 s.c. Intraocular pressure (IOP): right eye = 14 mmHg, left eye = 15 mmHg. In the study with a slit lamp: the right eye and the left eye - anterior segments correct, cataracts in both eyes. Fundus examination with a slit lamp showed an extensive haemorrhage covering the macula in the right eye. In the left eye the macula was without reflexes, otherwise there were no pathological changes. In an indocyanine green chorioangiography (ICG) study in the right eye at the posterior pole a vast area of the fluorescence blocking was seen in the projection of subretinal haemorrhage, in the centre changes from the early phases, a hyperfluorescence focus growing in time and persisting into late phases, in favour of the diagnosis of the active choroidal neovascularisation (CNV) (Fig. 1).

The patient was admitted to the department of ophthalmology for a surgery two days after the diagnosis — infusion of 0.5 ml of the pure SF₆ gas into the vitreous body of the right eye. Visual acuity on admission was: right eye = CF 1' (correction does not help). The surgery and postoperative period went without complications. The patient was discharged home on the second day with visual acuity: right eye = 0.5/50. Antibiotic drops and tropicamide topically to the operated eye, and capillary stabilising agents in tablets were recommended. The patient maintained a face-down position postoperatively for a week.

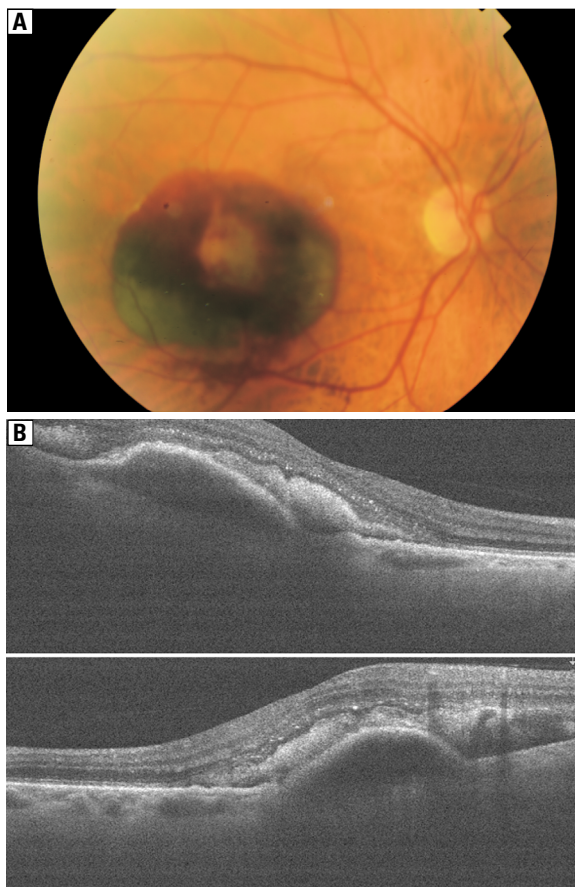


FIGURE 1. A photo of the fundus showing an extensive subretinal haemorrhage covering the macula (A). In the optical coherence tomography (OCT) image (Optovue Avanti) a distorted layer structure of the retina is visible, a hyperreflective structure with an accompanying hyporefective fluid space is present under the neurosensory retina and an extensive pigment epithelial detachment (PED) caused by subretinal haemorrhage. Central retinal thickness (CRT) = 417 μ m (B)

A week after the the SF₆ gas infusion the patient came to a follow-up appointment to the AMD clinic. Visual acuity: right eye = 5/50 (Fig. 2).

A month after the surgery the patient returned for another check-up at the AMD clinic. Visual acuity: right eye = 0.5/50 ccor 1.75 – 0.75 sph cyl ax 72 = 5/25. In the examination of the fundus a significant improvement was seen in relation to the preceding examination, the haemorrhage was located more paracentrally. CNV was seen in the macula (Fig. 3).

Four weeks after the administration of SF₆ gas the patient received an injection of intravitreal anti-VEGF (bevacizumab) to the operated eye. A week after the injection she came for a check-up to the AMD clinic. Visual acuity: right eye = 5/25 ccor + 1.75 sph –0.75 cyl ax 72 (Fig. 4).

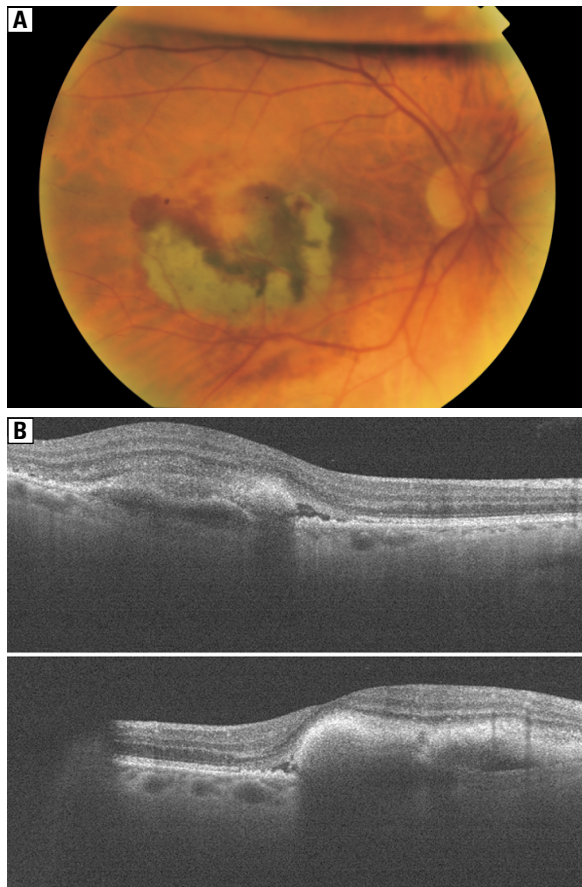


FIGURE 2. A photograph of the fundus one week after the surgery. A bubble of SF₆ gas visible. As compared to the previous examination a smaller range of haemorrhage with its slight displacement can be seen (A). OCT of the right eye macula after the infusion of 0.5 ml of the SF₆ gas into the vitreous body. CRT = 369 μm (B)

In an OCT examination a week after the intravitreal injection of anti-VEGF a dramatic improvement of the retinal morphology image was achieved, compared to the pre-treatment condition. The outline of the fovea was recovered, CRT dropped to 322 μm. There was no fluid under the neurosensory retina. Clinically, this correlated with the improvement of visual acuity of the patient: right eye = 5/25 ccor + 1.75 sph -0.75 cyl ax 72.

A month after the first injection the patient received a second dose of the injection of intravitreal anti-VEGF (bevacizumab) to the right eye. Two weeks after the second injection she came for another check-up to the AMD clinic. Visual acuity was: right eye = 5/16 ccor + 1.75 sph -0.75 cyl ax 72, the left eye 5/5 f. The patient subjectively reported a significant vision improvement. In the fundus examination almost complete haemorrhage resorption was visible. Only a small haemorrhage remains paracentrally with

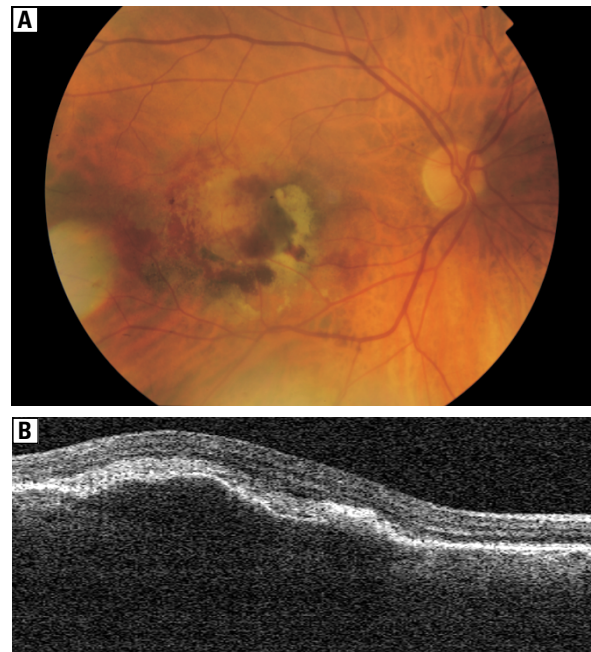


FIGURE 3. A photograph of the fundus a month after the administration of SF₆ gas (A). OCT of the macula one month after the surgery. CRT = 357 μm. The PED remains, no outline of the fovea (B)

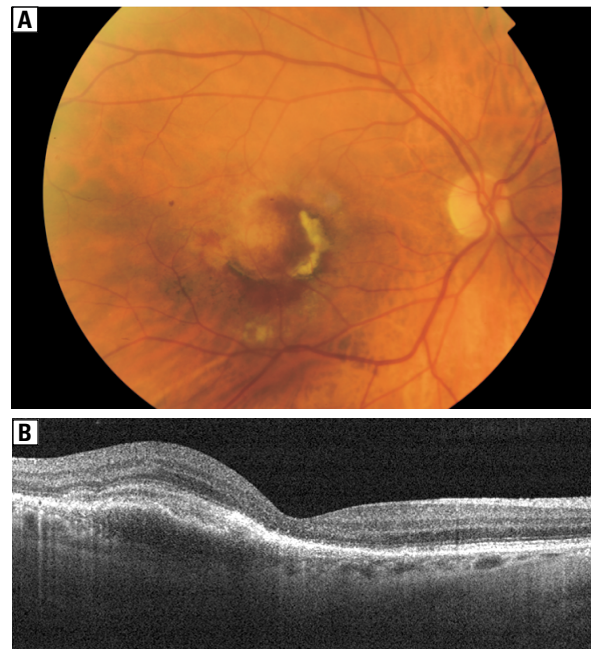


FIGURE 4. A photograph of the fundus – a significant partial resorption of the haemorrhage is visible (A). The OCT of the macula a week after the first injection, the outline of the fovea was visible, and there was no fluid under the neurosensory retina. A hyperreflective temporal structure was visible from the fovea — CNV (B)

a scar forming. In the OCT an outline of the fovea was visible, lack of fluid, and a further reduction of the CRT to the value 303 μm was seen (Fig. 5).

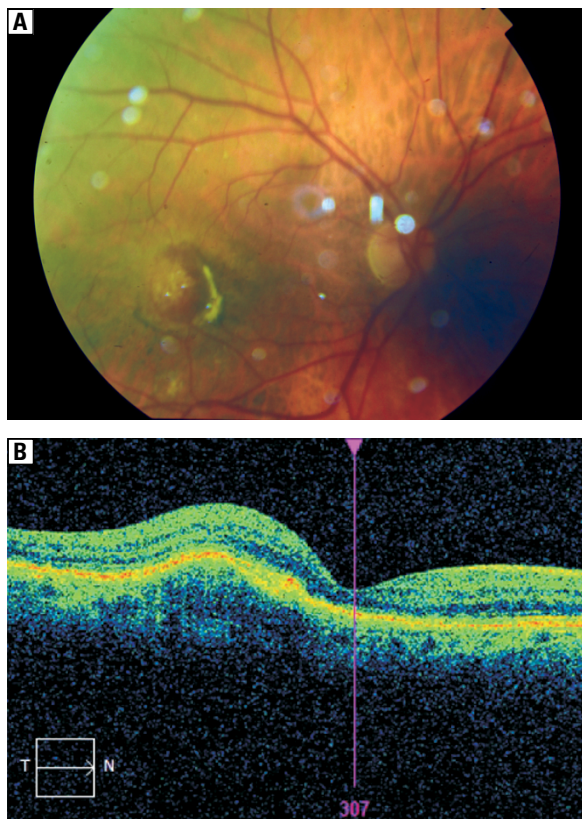


FIGURE 5. A photograph of the right eye fundus two weeks after the second anti-VEGF injection (A). The OCT of the right eye macula (Zeiss) two weeks after the second dose of the injection of intravitreal anti-VEGF. CRT = 303 μm . An outline of the fovea was visible, elevation of the retina layers temporally from the foveola with the CNV hyperreflective structure. No fluid under the neurosensory retina (B)

SUMMARY

A 68-year-old patient with submacular haemorrhage in the right eye in the course of exudative AMD underwent a surgical treatment, i.e. the infusion of 0.5 ml of SF₆, achieving partial displacement of submacular haemorrhage from above the macular area down. Then, four weeks after the surgery two intravitreal injections of anti-VEGF (bevacizumab) were given in a monthly interval. Three months after

the submacular haemorrhage, the applied treatment resulted in a significant improvement in visual acuity of the right eye: from CF 1' to 5/12 ccor +1.75 sph -0.75 cyl ax 72. The fundus examination showed a significant resorption of the haemorrhage with its displacement. The OCT examination revealed the restoration of the fovea outline, a relative normalisation of retinal morphology, and the absence of fluid under the neurosensory retina. The CRT dropped from the initial value of 417 μm to 215 μm (in the fovea).

CONCLUSIONS

A combined therapy of pure SF₆ gas infusion and intravitreal injection of anti-VEGF used in patients with early diagnosed submacular haemorrhage in the course of the exudative form of AMD can bring satisfactory results with a significant improvement in visual acuity.

COMPETING INTERESTS

The authors declare that they have no competing interests. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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