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## Management of wet AMD in an elderly patient - case report

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### Abstract

**Introduction:** Age-related macular degeneration (AMD) is the most common cause of central vision loss in elderly people over 50 years of age. It is characterized by the presence of drusen on the fundus and may be associated with choroidal neovascularization (CNV) or geographic atrophy. AMD is a condition caused by many factors including environmental, genetic, and vascular. Currently, it affects over 25 million people worldwide, but with the progressive aging of the population, the incidence of the disease is increasing. Disease is therefore an important issue in geriatrics.

**Case report:** A 75-year-old patient was referred to the General and Pediatric Ophthalmology Clinic of the Medical University of Lublin due to the three-week deterioration of visual acuity in the left eye. The visual acuity of the left eye was: counting fingers at a distance of 1.5 m. Initial cataracts of this eye and wet AMD were diagnosed. In July 2018. an injection of ranibizumab was administered into the vitreous humor of the left eye. After achieving an improvement in visual acuity to 0.2 (on Snellen charts), in September the patient was qualified to the Drug Program for the treatment of the wet form of AMD. From September to October 2019. the patient received 9 doses of ranibizumab. In October 2019. visual acuity improved to 0.4. In November, due to the unsatisfactory results of the therapy, the drug was changed to aflibercept. The patient received a total of 3 injections of this drug and his visual acuity improved to a value of 0.7. The last injection was given in July 2020 and the clinical

condition and visual acuity stabilized. After the end of the drug program, the patient regularly shows up for checkups, and the visual acuity of the left eye has normalized since July 2020. and is now 0.4 (due in part to atrophic changes and scarring).

**Conclusions:** Treatment of the wet form of AMD is a difficult and lengthy process. Early diagnosis of the disease, starting treatment as soon as possible, regular checkups and cooperation with the patient are very important for the success of the therapy. During 3 years of treatment, the patient experienced a significant improvement in visual acuity for one year. The treatment allowed the disease progression to slow down. The morphological condition of the retina improved. The applied treatment and management of the elderly patient turned out to be effective, and the achieved effects of the therapy are satisfactory.

## **Introduction**

Age-related macular degeneration (AMD) is the leading cause of blindness in the elderly population. It is characterized by progressive macular degeneration leading to central vision loss. On a global scale, the number of diagnosed patients with different AMD forms is estimated to be at least 20 million [1] and according to WHO data, the exudate form is present in 3 million people, which accounts for 50% of all cases of central blindness in highly developed countries [2]. Moreover, it is predicted that due to the aging of the population, the number of people with AMD will increase in the coming years [3].

The pathogenesis of AMD has not been fully established, possibly related to a complex, multifactorial mechanism initiating the onset and progression of the disease [4]. Risk factors that predispose AMD to occur include advanced age, family history, and cardiovascular risk factors such as high blood pressure and smoking [5].

In the initial stage of the disease development, single drusen, pigment rearrangements and small atrophic changes are observed at the fundus. Over time, the disease may progress to geographic atrophy (non-exudative form) or neovascularization (exudative form). The exudative form is less common, but accounts for 90% of acute blindness due to AMD. It is characterized by choroidal neovascularization (CNV) with intraretinal or subretinal shunt, hemorrhage, and retinal pigment epithelium (RPE) detachment.

In the treatment of wet AMD, intravitreal anti-VEGF injections are currently the best therapeutic option to stop the disease progression. On the basis of multicentre, randomized clinical trials, such as MARINA and ANCHOR, a statistically significant improvement in vision and its stabilization was demonstrated in patients regularly receiving these preparations. Therapy with ranibizumab is currently the most effective method, providing stabilization in 90% of patients, and 30-40% - chances of a significant improvement in vision [6][7].

## **Objective**

This article presents the case of a patient qualified for the Drug Program for the treatment of the wet form of AMD, in whom long-term therapy with anti-VEGF preparations allowed for a significant improvement in visual acuity and slowed down the disease progression.

## Case report

A 75-year old male was referred to the General and Pediatric Ophthalmology Clinic of the Medical University of Lublin due to the three-week deterioration of vision in the left eye. The visual acuity of the left eye was CF (counting fingers) 1,5m. The visual acuity of the right eye was 1,0 on the Snellen chart. Assessment of the anterior chamber of the eye and fundoscopy were performed. Subretinal neovascular membranes and subretinal fluid were detected after angio-OCT examination. The patient was diagnosed with age-related macular degeneration (AMD) and early-stage cataract of the left eye.

After one intravitreal injection of ranibizumab and improvement of visual acuity of the left eye to the 0,2 on the Snellen chart, the patient was qualified to the Drug Program for the treatment of the wet form of AMD. Angio Retina Multi Scan View, visual acuity assessment and intraocular pressure examination were performed during every appointment. Injection was administered if components of the neovascular membrane, such as retinal fluid, RPE detachment or subretinal haemorrhage, were found in the angio-OCT. Patient has received 9 injections of ranibizumab since September 2018 to October 2019.

In November 2019, due to unsatisfactory results of the therapy (retinal fluid was still present) medicine was changed from ranibizumab to aflibercept. The highest visual acuity (0,7 on the Snellen chart) was achieved after first intraocular injection of aflibercept. In total, 3 intraocular injections of aflibercept were administered.

Patient has received the last dose in July 2020 and since then he has not been given any other intraocular medicine. The morphological state of the retina has significantly improved. Retinal edema and other components of neovascular membrane were no longer found in the angio-OCT. The visual acuity of the left eye has improved and remained stable to 0,4 on the Snellen chart.

The result of therapy is excellent. The visual acuity of the left eye has improved from CF from 1,5m to 0,4, which is nearly half of the Snellen chart.

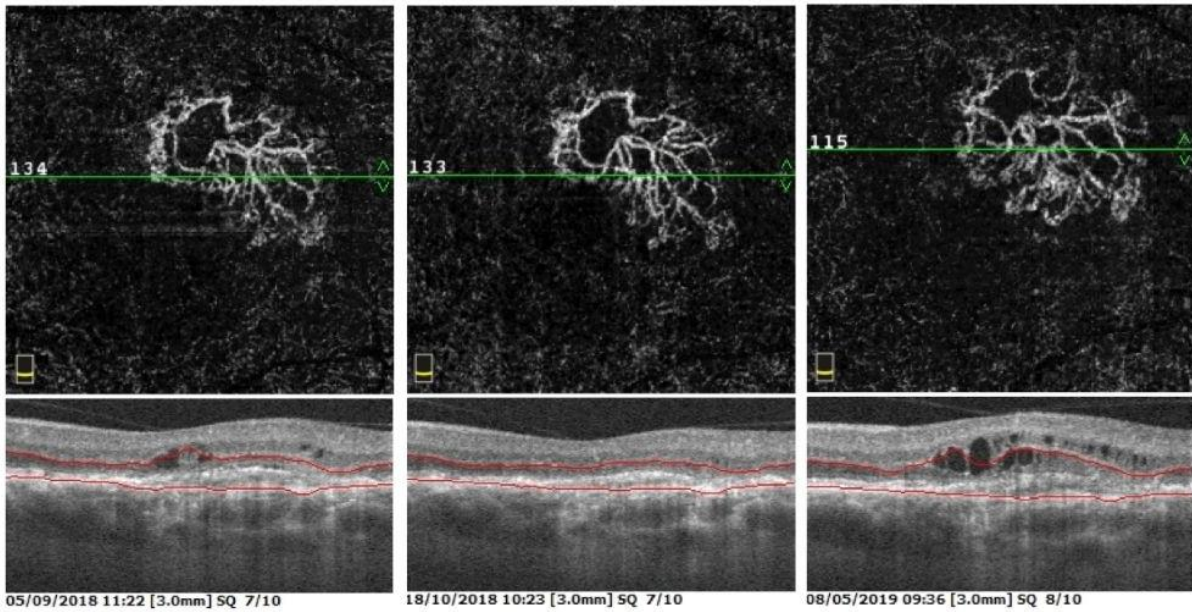


Figure 1.

Angio-OCT helps to obtain images of structures of the posterior pole of the eye. This method detects components of wet AMD. In the superior section of the image, a neovascular membrane is shown. In the inferior section we observe the cross-sectional image of the retina. Typically, retinal detachments, haemorrhages and neovascularization are found. Retinal fluid is viewed as black cysts.

(Fig. 1) In September 2018, angio-OCT detected retinal fluid and the patient received a first dose of ranibizumab. In October 2018, month after the injection, the morphological state of the retina has improved. In May 2019, after 5 injections of ranibizumab the fluid was still present.

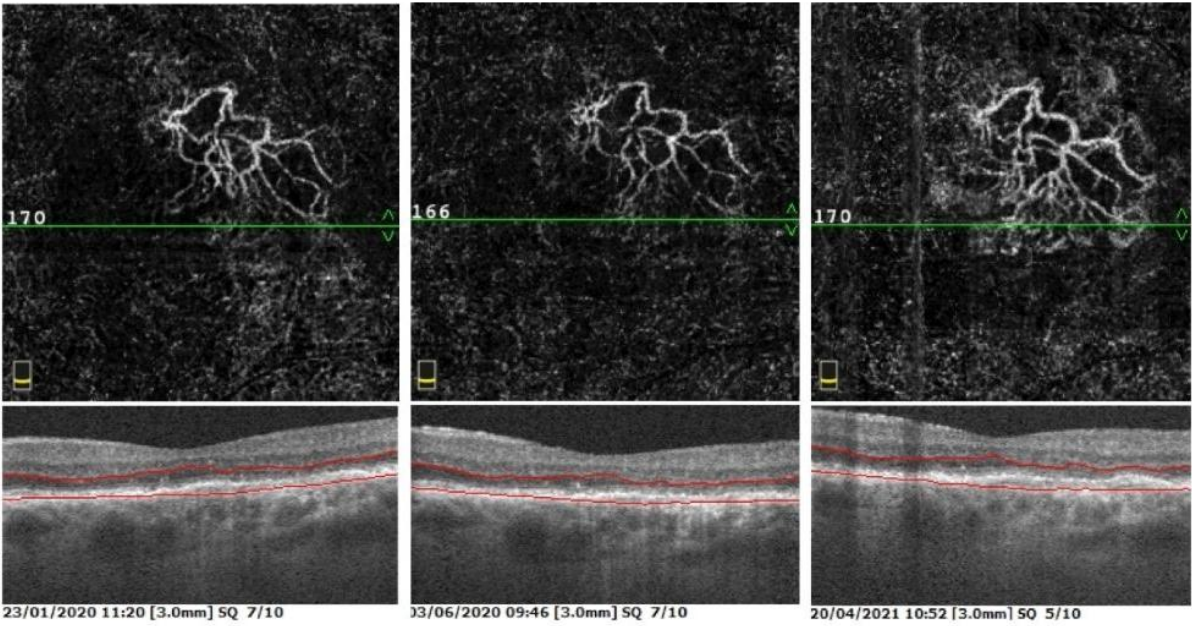


Figure 2.

(Fig. 2) The first image views the patient's retina after one dose of aflibercept, which was administered 2 months ago in November 2019. No significant amounts of retinal fluid or haemorrhage were detected. Second image shows the patient's retina after second dose of aflibercept. Last image comes from angio-OCT examination performed 9 months after the third dose of aflibercept. No new morphological symptoms of executive AMD were detected.

## Discussion

It is estimated that approximately 19% of the European population over 65 will lose their eyesight due to AMD. The growing number of patients globally is explained mainly by the increasing life expectancy [8]. The first signs are non-specific and difficult for the patient to see, especially when they only affect one eye. Over a long period of time the disease may develop slowly and asymptotically [9]. Common symptoms of macular degeneration include: decreased visual acuity (the most commonly reported early symptom), seeing straight lines as wavy or distorted, discomfort, and difficulty reading and writing. Letters become dim, fuzzy and blurry, objects - distorted. A symptom of the late stage of the disease is central scotoma - darkening of the center of the field of vision. The disease progresses at different rates and can even lead to complete blindness. The disease usually develops binocularly, but not necessarily at the same rate and intensity. According to many authors, within one year of the diagnosis of wet AMD in one eye, there is a 5-15% risk of developing lesions in the other eyeball [10]. In our patient the visual acuity of the right eye was 1.00 (correct).

The causes of age-related macular degeneration (AMD) are poorly understood. They are multifactorial and involve complex metabolic, functional, genetic and environmental processes. AMD can be divided into dry and wet form. The wet form of AMD ( Neovascular or exudative AMD) is much more serious. It occurs in approximately 10% of patients, but is responsible for almost 90% of severe vision loss cases [9]. The dry AMD (also called nonexudative AMD) form may become the wet form, with a rapid worsening of symptoms. Progression is favored by smoking and unbalanced blood pressure [9]. The influence of genetic factors on the development of AMD is very likely. Many studies point to a family history of the disease. However, no single genes having a key impact on the incidence of AMD have yet been identified [9]. A full ophthalmological examination is performed in a patient with suspected AMD: far and near visual acuity (Snellen charts and special ETDRS charts) and eye fundus examination with dilated pupils [1] [2]. Additionally, the Pella-Robson contrast test, the measurement of intraocular pressure and the Amsler test are also used [10]. The treatment method is anti-VEGF therapy. VEGF is a vascular endothelial growth factor that stimulates choroidal neovascularization (CNV). Therapy is based on the local administration of substances that block the action of VEGF. The following drugs are used in the form of intravitreal or periocular injections with good results: pegaptanib, ranibizumab, bevacizumab, triamcinolone [11].

Treatment of the wet form of AMD is a difficult process, but the positive results obtained give enormous satisfaction. The introduced drug program makes it possible to conduct therapies that meet the current international standards. Early diagnosis of the disease, as soon as possible initiation of treatment, proper continuation of treatment including regular checks and good cooperation with the patient are very important for the success of the therapy. The

presented case shows how important all these conditions are, and their fulfillment leads to therapeutic success. The patient was given an intravitreal injection of ranibizumab in July 2018. After achieving an improvement in visual acuity to 0.2, the patient was enrolled in the drug program in September. The patient received 9 doses of ranibizumab from September to October 2019. In October 2019, visual acuity improved to 0.4. In November, due to the unsatisfactory results of the therapy, the drug was changed to aflibercept. The patient received a total of 3 doses of the drug. The highest visual acuity in the affected eye was 0.7. The last injection was given to the patient in July 2020. After completing the drug program, the patient regularly comes for checkups, his left eye visual acuity has normalized and since July 2020 it is 0.4. The morphological condition of the retina was improved. Over the 3 years of treatment, the patient experienced a significant improvement in visual acuity, demonstrating the effectiveness of anti-VEGF therapy.

## Conclusions

Age-related macular degeneration (AMD) is a common macular disease affecting elderly people. It is characterized by the appearance of drusen in the macula, accompanied by choroidal neovascularization (CNV) or geographic atrophy [12]. The role of anti-vascular endothelial growth factor (anti-VEGF) agents has transformed the therapeutic approach of the potentially blinding disease "wet AMD" into a more favorable outcome. Early diagnosis of the disease, starting treatment as soon as possible, regular checkups and cooperation with the patient are very important for the success of the therapy. They are also crucial to slow down the disease progression and improve the morphological condition of the retina. The patient during 3 years of treatment had much a better chance of maintaining his visual acuity for one year, so it proved management to be effective and the achieved results of the therapy are satisfactory.

## Conflicting interests

The authors declare that there is no conflict of interest.

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