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https://doi.org/10.5281/zenodo.1239012 **Case Report**

Treatment of Proliferative Diabetic Retinopathy with Panretinal Photo Coagulation and Anti VEGF Injection, Depending on the Case

Healthcare

Keywords: PRP, PDR, VEGF, DME, etc.

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Abstract

Proliferative diabetic retinopathy (PDR) is the most common cause of severe visual loss in people with diabetes. Although panretinal photocoagulation (PRP) remains one of the best treatment, it has many side effects. So other new treatment modalities have emerged. These can be used to increase the extent of treatment, expedite the effect of laser treatment and provide alternate measures when laser delivery is difficult or impossible, especially in patients with vitreous haemorrhage, or when the patient is at young age. Currently, most of the research in this field is focussed on inhibitors of vascular endothelial growth factor (VEGF). Although limited by their short-lived effects, anti-VEGF agents are widely available, especially for the treatment of aggressive PDR. We present 2 cases which had regression of neovascularization within four weeks of the initial treatments, and maintained their visual acuity with no evidence of recurrent neovascularization through 12 months after initiating treatment. Intravitreous injections of anti-VEGF therapy may be an alternative treatment option for patients with PDR. We followed a system of 3 injection q4wk followed by injection q8wk, depending on gravity of macular edema and it's regression from anti-VEGF intravitreal injections.

Introduction

Diabetic retinopathy is a disorder of the retinal vessels that eventually develops to some degree in nearly all patients with long-standing diabetes mellitus. Contributes 4.8% of the 37 million cases of blindness throughout the world. Most Common cause of bilateral severe visual loss in working age group. After 20 years of diabetes, nearly 99% of patients with type 1 diabetes and 60% with type 2 have some degree on diabetic retinopathy. 33% of patients with diabetes have signs of diabetic retinopathy. People with diabetes are 25 times more likely to become blind than the general population. The best predictor of diabetic retinopathy is the duration of the disease.

Risk factors for diabetic retinopathy: Age at diagnosis of diabetes; Duration; Poor control of diabetes; Pregnancy; Hypertension; Nephropathy; Hyperlipidemia; Obesity; Anemia; Smoking; Cataract surgery.

Pathophysiology

Diabetic Retinopathy is a microvasculopathy that causes: Retinal capillary occlusion and Retinal capillary leakage.

Microvascular occlusion is caused by: Thickening of capillary basement membranes; Abnormal proliferation of capillary endothelium; Increased platelet adhesion; Increased blood viscosity; Defective fibrinolysis.

Microvascular leakage is caused by: Impairment of endothelial tight junctions; Loss of pericytes; Weakening of capillary walls; Elevated levels of vascular endothelial growth factor (VEGF).

Overtime, retinal capillary closure can occur, and parts of the retina may become ischemic. VEGF released by the ischemic retina can stimulate the growth of abnormal capillaries, termed neovascularization at the disc or elsewhere in the retina, which are features of proliferative diabetic retinopathy (PDR). VEGF also can cause hyperpermeability ofretinal vessels,which can lead to vision loss from diabetic macular edema (DME), i.e.,swelling or thickening of the center of the retina. Panretinal photocoagulation (PRP), which destroys part of the ischemic retina, thus reducing the release of VEGF, is the standard treatment for PDR. Close to 60% of patients show regression of neovascularization within 3 months of PRP treatment. However, there are many adverse effects of PRP, including pain, decreased peripheral and night vision, increased risk of macular edema, and progression of visual loss in nearly 5% of patients despite treatment. Decreased peripheral and night vision are unavoidable side effects to this destructive procedure so it should be avoided as long as it can, especially on young ages due to lost of peripheral and night vision.

Case presentation 1

B.T a 69 year old man who has been treated with insulin for the last 18 years presented at our clinic after his endocrinologist asked him so. After the examination it was noted an advanced diabetic retinopathy. His visual acuity was 2/20 OD, and 4/20 on OS. Oct showed severe diabetic macular edema on both eyes (figure 1) and fluorescein angiography showed capillary non perfusion on periphery of the retina. We performed panretinal photo coagulation (PRP) (figure 2) combined with 3 injection of intravitreal aflibercept 40mg/ml q4wk. After 4 months we noticed a good regression of macular edema on OCT and the patient gained a VA of about 30% on his right eye and 35% on his left eye (figure 3). We performed intravitreal injection of aflibercept q8wk on both eyes for the next 8 months, and managed to maintain his visual acuity on 6/20 on OD and 7/20 on OS after one year with no change on macular edema.

Case presentation 2

K.H is 67 years old man with history of uncontrolled diabetes for more than 5 years. He presented at our clinic due to his blurred vision in the last 2 months. After the examination he was diagnosed with proliferative diabetic retinopathy in both eyes with severe macular edema(figure 4). Immediately we performed intravitreal injection of aflibercept in both eyes, followed by 2 more injection in the next 2 months. He had a good response and a reduction of the macular edema from 785μm to 534μm on his right eye to the macular thickness, and from 583μm to 420μm to his left eye (figure 5). After that, we continued the intravitreal injection af aflibercpt every next month. 12 months after we had a very good and stabilized situation for the patient. OCT showed a macular thickness 217μm on his right eye with BCVA 8/20 and 266μm on his left eye with BCVA 7/20 (figure 6).

Discussion

Anti-VEGF agents are known to be effective in the treatment of ocular neovascularization associated with age-related macular degeneration, and have been proven to be superior to macular laser for treating diabetic macular edema, and have the potential to be effective in other neovascular processes of the eye such as PDR. It may not be possible to proceed with the panretinal photocoagulation (PRP), unless you find huge zones of capillary non perfusion. You should avoid or at list postponed PRP especially if the patients are young and want to save their peripheral and night vision. Using anti-VEGF may keep the situation stabilized with a good and promising visual acuity performing injection every next month.

Conclusion

Diabetic retinopathy is a disorder of the retinal vessels and the most Common cause of bilateral severe visual loss in working age.

Best available treatment for PDR is panretinal photocoagulation (PRP) and intra vitreal injection of anti-VEGF.

PRP has many adverse effects including pain, decreased peripheral and night vision, increased risk of macular edema, and progression of visual loss in nearly 5 percent of patients despite treatment.

Intravitreal injection of Anti-VEGF may be the safes and best solution in treatment of diabetic macular edema for the long term.

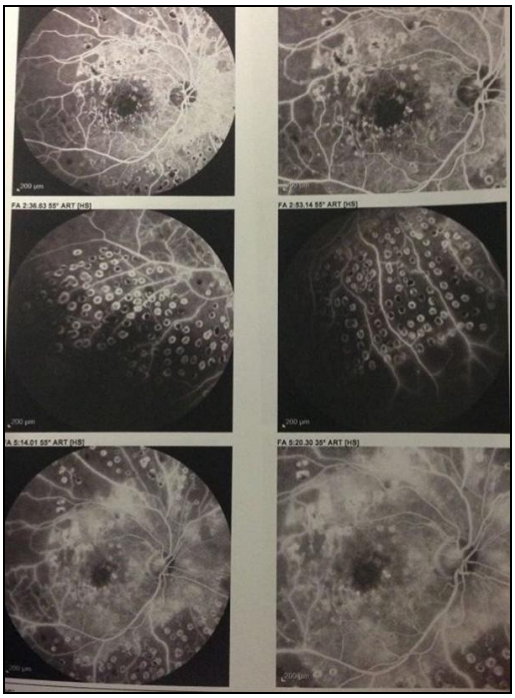


Figure 1

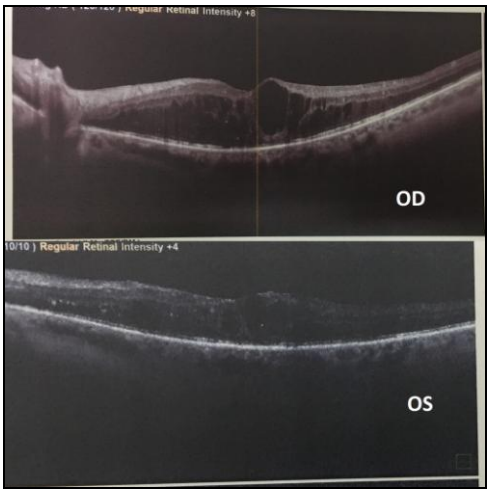
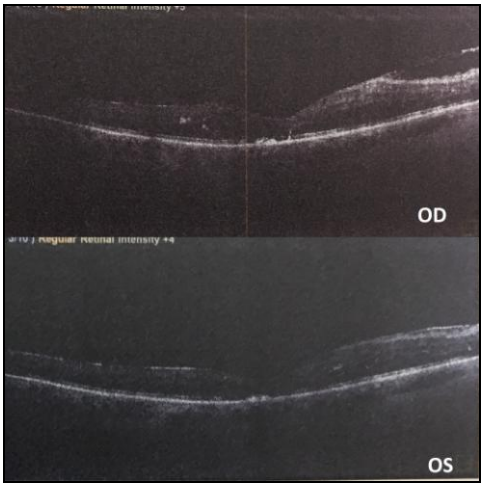


Figure 2



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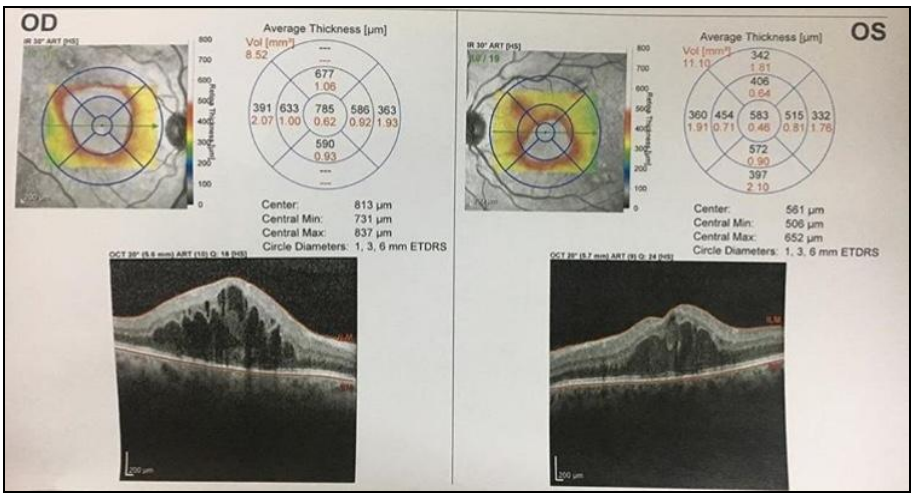

figure 4

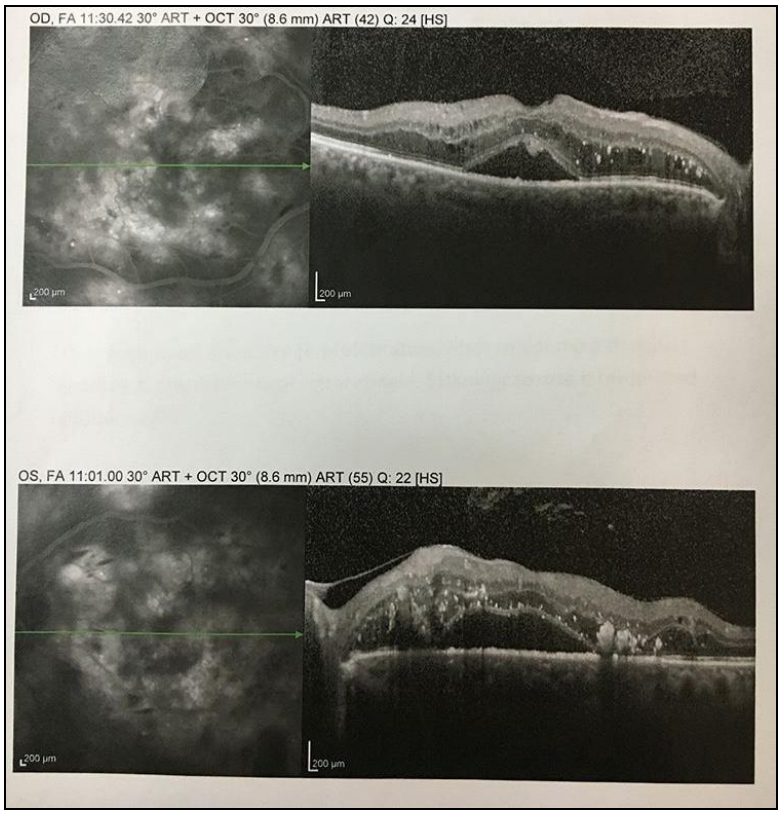

Figure 5.

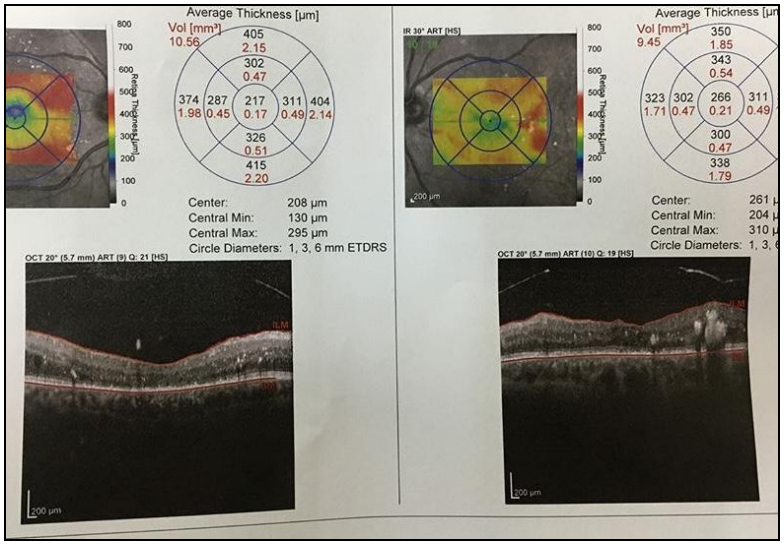

Figure 6.

References

Retina in systemic disease : a color manual of ophthalmoscopy / Homayoun Tabandeh, Morton F. Goldberg 2009.

Treatment of proliferative diabetic retinopathy with anti-VEGF agents | Request PDF. Available from: https://www.researchgate.net/publication/49811184_Treatment_of_proliferative_diabetic_retinopathy_with_anti-VEGF_agents [accessed Mar 19 2018].

Centers for Disease Control and Prevention. National diabetes fact sheet: national estimates and general information on diabetes and prediabetesin the United States, 2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention: 2011.

Early Treatment Diabetic Retinopathy Study Research Group. Fundus photographic risk factors for progression of diabetic retinopathy. ETDRS report number 12. Ophthalmology. 1991;98(5 Suppl):823-33.

Kempen JH, O'Colmain BJ, Leske MC, et al. The prevalence of diabetic retinopathy among adults in the United States. Archives of ophthalmology. 2004;122(4): 552-63.

Aiello LP. Angiogenic pathways in diabetic retinopathy. N Engl J Med. 2005; 353(8): 839-41.

Early Treatment Diabetic Retinopathy Study Research Group. Early Photocoagulation for Diabetic Retinopathy. ETDRS report number 9. Ophthalmology. 1991; 98(5): 766-85.

Jardeleza MSR, Miller JW. Review of anti-VEGF therapy in proliferative diabetic retinopathy. Seminars in ophthalmology. 2009; 24(2): 87-92.