INTRAVITREAL BEVACIZUMAB AS INITIAL TREATMENT FOR IDIOPATHIC RETINAL VASOPROLIFERATIVE TUMOR: A CASE REPORT

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INTRODUCTION

The histopathological description of what we now know as retinal vasoproliferative tumor (RVPT) was first done by Henkind and Morgan back to 1966, based in findings that they quoted as "Coat's like" appearance in eyes enucleated due to other diseases.

In 1995, Shields et al. reported 103 cases of peripheral acquired retinal vascular tumor and proposed the term RVPT.

Retinal vasoproliferative tumor (RVPT) is a rare disease that has capillary hemangioma as the most frequent diferencial diagnosis. The tumor is considered to be of reactive nature. It can be idiopathic (primary) or secondary to other ocular diseases such as: uveitis, retinitis pigmentosa, sickle cell disease, Coat's disease, previous surgery and retinopathy of prematurity. Primary RVPTs are typically located in the inferotemporal or inferior portion of the fundus and tend to be solitary, small, and between the globe equator and ora serrata. Secondary VPTs are more often multifocal, bilateral, and believed to be a reactive vascular response to a variety of ocular insults

Although RVPT is a benign tumor, it can produce profound visual loss related to remote effects of the tumor, including macular exudation, cystoid macular edema, and vitreous hemorrhage and epimacular membrane. Also, it may cause retinal exudates, haemorrhage and detachment. Lesions with no exsudation or visual decrease can be observed. Lesions that need treatment can be managed by on or more modalities such as cryotherapy, a variety of lasers, surgical excision, radiation, and antiangiogenic intravitreal injections.

In this case report we present a patient initially treated for a primary RVPT with intravitreal injection of bevacizumab 2.5mg/0.1ml, and at first with both anatomical and functional satisfatory response.

CASE REPORT

In February 2024, a 59 years old male patient, was admitted to the service complaining of progressively low visual acuity in his left eye (OS) for approximately 1 year. He denied previous surgeries, denied using eye drops and had no history of trauma.

There were no complaints in his right eye (OD). Visual acuity of OD was 1.0 (20/20) and OS was “hand motion” (HM). Intraocular pressure was 12 mmHg in OD and 18 mmHg in OS.

There wasn’t anterior biomicroscopic findings in both eyes. In fundoscopy examination, OD didn’t show any findings. OS revealed a ill-defined mass, suggesting a vascular proliferation, originating from inferior and inferotemporal periphery towards the optic disc, traction at the posterior pole with alteration of the macular anatomy and significant exudation throughout the retina, predominantly in the same regions of vascular proliferation, as well as in the macular region. Peripherically, retinal detachment associated with those exudations was also possible to notice.

Imaging exams were performed. Ocular Ultrassonography of OS revealed an elevated mass in inferotemporal periphery with 3.9 mm (lateral diameter) x 1.92 mm (antero-posterior diameter) and retinal detachment in its surroundings (Figure 1).

OCT of OS before bevacizumab shows a hyperreflective line above the ILM, disorganization of the inner and outer layers of the retina as well as subfoveal hyperreflective deposits at the level of the photoreceptor lines (Figure 2 - left).

Retinography of OS before bevacizumab (Figure 3a) shows intraretinal vascular proliferation consistent with an extensive vasoproliferative tumor in the inferior and inferotemporal region, with areas of exudation in periphery, peripapillary hemorrhage, vitreous hemorrhages, traction of the posterior pole as well as peripheral regions, and exudative retinal detachment in the peripheries.

The treatment for the case was considered, and it was decided to start it with an initial dose of intravitreal bevacizumab (2.5mg/0.1 ml) in OS. There were no complications during the procedure. The patient was monitored, returning to the service after 7, 14, and 19 days following the application. Retinography was performed in all those returns (Figures 3b, 3c, 3d) and OCT was performed on day 19 (Figure 2- right) for comparative purposes.

Retinographies showed a reduction in the extent of exudative areas (Figures 3b, 3c, 3d), as well as a decrease in vitreous and peripapillary hemorrhages. In the macular and perimacular region, a reduction in the tractional component was also observed, although areas of exudation still persisted. The area of peripheral retinal detachment also appeared to be reduced. The OCT (Figure 2- right) showed persistence of hyperreflectivity above the ILM, with structural disorganization of the retinal layers and disruption of the ellipsoid zone, although an improvement of signal strength could be noticed. Areas of macular exudation were still identifiable. The OCT below Figure 2 – left shows an oblique view from the macula heading to periphery and traction in this area can be noticed.

The patient’s visual acuity after 19 days of intravitreal bevacizumab in OS improved from HM to Counting Fingers at 2 meters.

IMAGES

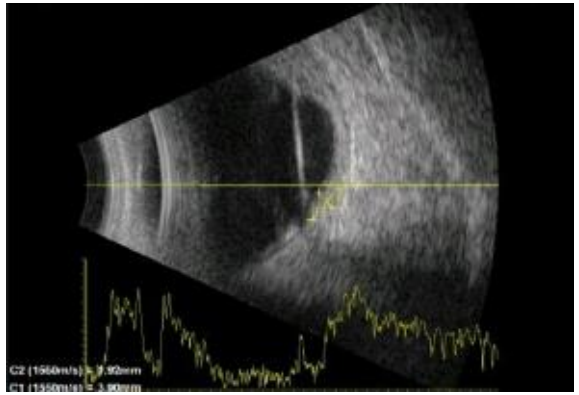
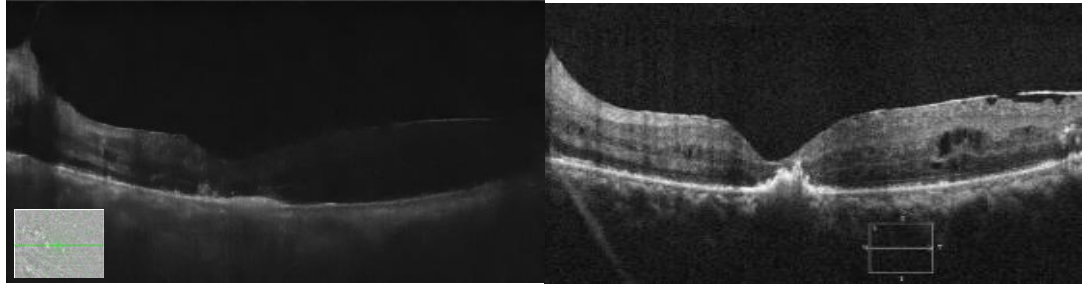
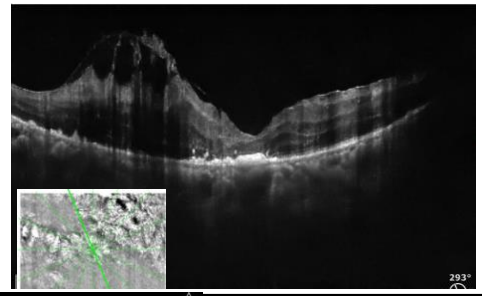


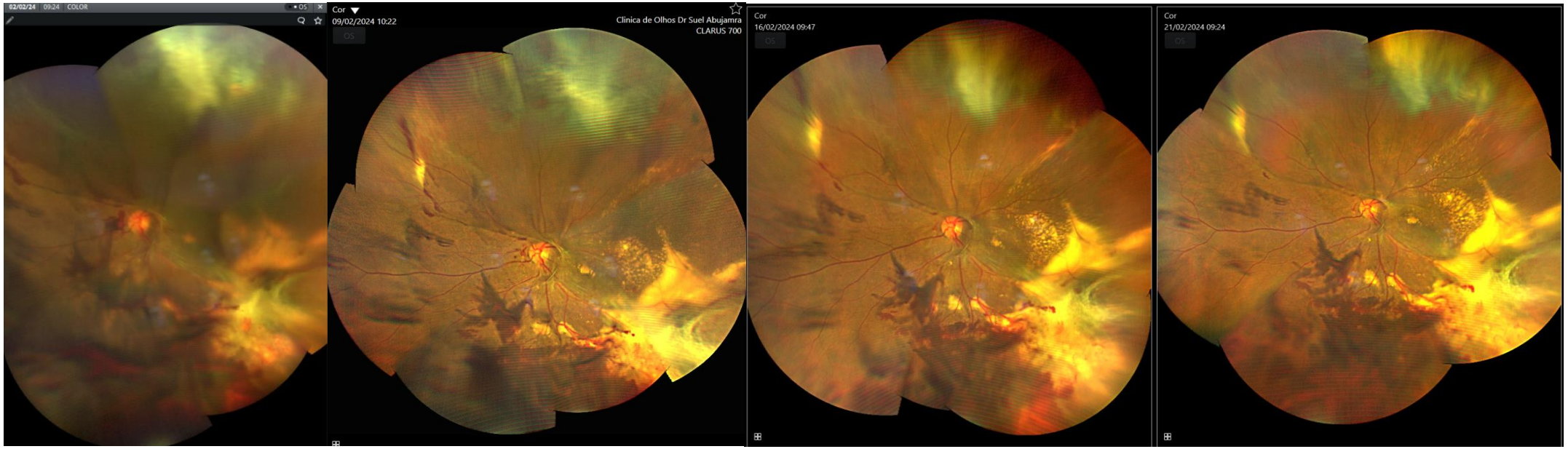
Figure 1: Ocular Ultrassonography of OS shows elevated mass (3.9mm LD x 1,92mm AP) with retinal detachment in its surroundings.



Figures 2 (left and right): OCT of OS from before bevacizumab (left) and 19 days after one application of intravitreal bevacizumab (2.5mg/0.1ml).



Oblique OCT: view from the macula heading to periphery. Traction in this area can be noticed.



From left to right: Figures 3 a – 3b – 3c – 3d – Retinographies of OS from before bevacizumab, 7 days, 14 days and 19 days after one application of bevacizumab (2.5mg/0.1ml).

DISCUSSION

Faced to a new RVPT case the first point to be addressed is the decision to treat or observe. It seems reasonable that patients with good visual acuity, small and stable tumor, no subretinal fluid and lacking exsudation can be observed, oriented to immediate return if any of other symptoms are noted. For symptomatic patients, or for those exhibiting signs of impending visual acuity risk, treatment is indicated.

After the decision to treat is taken, one should decide which treatment modality to use. The ideal treatment scheme for RVPTs is yet to be determined. A number of different treatment approaches have been described with variable success rates, such as cryotherapy, laser photocoagulation, photodynamic therapy (PDT), brachytherapy, surgical resection, intravitreous injections and immunomodulators. All of them can be used alone or in combination.

Cryotherapy seems to be the most frequently employed treatment modality for RVPTs. As RVPTS are usually located in the periphery, cryotherapy can be applied in a transconjunctival way, under observation through binocular indirect ophthalmoscopy. The treatment goal is to freeze all tumor, allowing slow thawing and repeating the whole process 2 or 3 times. More than one cryotherapy section can be necessary to achieve complete tumor involution specially, in thick tumors. Cryotherapy can cause some adverse effects like the persistence of macular edema and the occurrence of retinal detachment arising in a retinal tear adjacent to the scared area. Shields *et al* effectively treated active VPTs using triple freeze thaw transconjunctival cryotherapy, but the side effects include scleral thinning with discolouration and vitreous haemorrhage.

VPTs are highly vascularised tumours and, as such, may be susceptible to anti-VEGF treatments. It is likely that VEGF is involved in the aetiology of vasoproliferative tumours. Their natural history involves neovascularisation, leakage of exudates, and tractional retinal detachment.

On literature, one case of VPT has been treated with bevacizumab and underwent complete regression of the tumour after just one intravitreal injection. This case has already been reported by Kenawy *et al.* Saito *et al* have recently reported two patients whose VPTs regressed following a single dose of bevacizumab.

With these considerations in mind, we opted to initially administer an application of bevacizumab and to observe the patient's progression following the procedure. Through regular visits to the clinic, we are conducting ongoing monitoring of the patient, assessing both functional outcomes and the tumor's response to the medication. Based on these evaluations, we will make informed decisions regarding the potential expansion of treatment to include cryotherapy, consider an additional application of bevacizumab, implement photocoagulation, or continue to observe the disease course. In each case, the risks and benefits of each potential intervention will be carefully weighed.

BIBLIOGRAPHY

- E.F.Marback, R.L.Guerra, O.O.Maia Jr., R.L.Marback. Retinal vasoproliferative tumor. Arq Bras Oftalmol. 76 (3). June 2013

- Kenawy N, Groenwald C, Damato B. Treatment of a vasoproliferative tumour with intravitreal bevacizumab (Avastin). Eye (Lond). 2007;21(6):893-4

- Shields CL, Shields JA, Barrett J, De Potter P. Vasoproliferative tumors of the ocular fundus. Classification and clinical manifestations in 103 patients. Arch Ophthalmol. 1995;113(5):615-23

- Gordon MS, Cunningham D . Managing patients treated with bevacizumab combination therapy. *Oncology* 2005;