

Intravitreal bevacizumab for the treatment of choroidal neovascularization secondary to idiopathic macular telangiectasia

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Introduction

Idiopathic macular telangiectasia (IMT) or juxtafoveal telangiectasia is a developmental or acquired vascular anomaly of the foveal avascular zone characterized by irregular capillary dilatation, serous exudation and macular edema.¹ Gass and Blodi has subdivided this disorder into three categories.² Type 1 consists of unilateral congenital or acquired whereas type 2 is bilateral acquired juxtafoveal telangiectasia. Type 2B is added as juvenile familial IMT. Type 3 is bilateral macular telangiectasia and characterized by progressive capillary obliteration and optic disc pallor. Subretinal neovascularization may develop in the later stages of type 2A IMT which can lead to rapid and severe loss of vision.³ Vascular endothelial growth factor (VEGF) plays an integral part in the formation of abnormal blood vessels and in increasing vascular permeability in many pathological conditions of the retina.⁴ Bevacizumab (Avastin), a humanized anti-VEGF antibody which inhibits VEGF-A protein, has been reported to cause a regression of choroidal neovascular membrane (CNVM) after intravitreal injection secondary to age related macular degeneration and myopia.⁵

In this study, we report the functional and structural outcome of four eyes of four patients who were treated with intravitreal off-label bevacizumab for idiopathic macular telangiectasia associated with CNVM.

Methods

This study is a retrospective interventional case series of four eyes of four patients, wherein intravitreal bevacizumab was injected as primary treatment.

Inclusion criteria

- Both eyes having Type 2 A IMT
- Only one eye having CNVM
- Not myopic
- No evidence of AMD clinically
- Not suffering from any other disease that might cause CNVM

Before treatment full ophthalmological examination was done. Best corrected visual acuity (BCVA) was recorded with the standard Snellen chart. Color fundus photography, fluorescein angiography (FFA) alongwith fast macular scan and line scan by Optical coherence tomography (OCT) (Stratus OCT, Carl Zeiss Meditec, Dublin, California, USA) were done before treatment. Both FFA and OCT were suggestive of presence of CNVM. A clearance from a general physician was taken for each patient before subjecting the patient to intravitreal bevacizumab injection. A 0.2 ml aliquot of commercially available bevacizumab (25 mg/ml) (Avastin, Genentech, San Francisco, CA) was prepared for each patient. One aliquot was used for a single injection. After preparing the eye with 5% povidone iodine, 1.25 mg (0.05 ml) of bevacizumab was injected intravitreally via the pars plana using a 26-gauge needle. The eye was bandaged for 3–4 hours and patients were instructed to apply topical ofloxacin eye drops (0.3%) four times daily for the next 4 days. Patients were seen the following day, after 6 days (for any injection related complication) and then at 4 week intervals. Blood pressure was also monitored. At each visit full ophthalmological examination including BCVA, fundus photography and OCT was made. Intravitreal injection was repeated at 4 week intervals if OCT showed persistent intraretinal edema and/or subretinal fluid (SRF). Fluorescein angiography was repeated at 12 week intervals. Retinal thickness was assessed by OCT using fast macular scan. The patients were followed up for a minimum period of 3 months.

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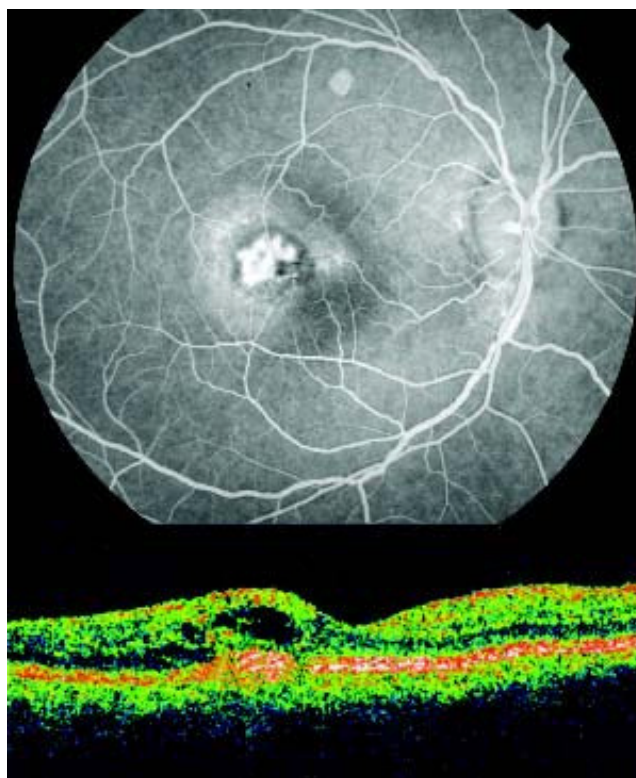
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Illustrative Case 1

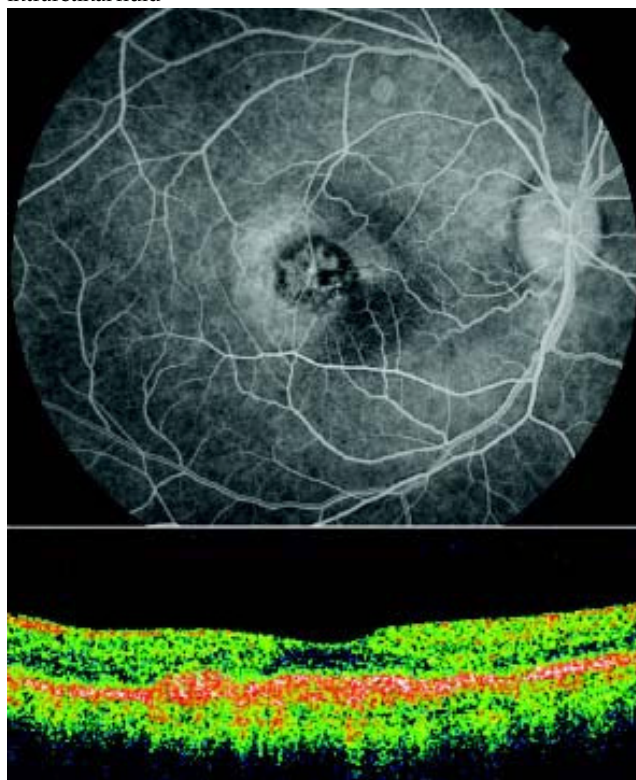
A 45 years old lady had a history of observing a paracentral scotoma in her right eye (RE) for three months. On examination, her initial BCVA in RE was 6/36. Baseline fundus examination showed intraretinal pigmented plaque in the parafoveolar temporal retina, and a reddish subretinal lesion at the parafoveolar temporal retina giving rise to a clinical diagnosis of CNVM secondary to macular telangiectasia in the RE. Fundus fluorescein angiography demonstrated no dye leakage from telangiectatic vessels but intense dye leakage from the CNVM in the right eye. Optical coherence tomography showed presence of a fusiform irregularity at the retinal pigment epithelium / retinal outer layer level along with intraretinal fluid. Central macular thickness by OCT was 345 μ . Adhering to the tenets of the Declaration of Helsinki and after detailed discussion with the patient regarding the pros and cons of injecting the patient's right eye with bevacizumab, an informed consent was obtained. 1.25 mg (0.05 ml) of bevacizumab was injected intravitreally via the pars plana. The patient was followed up as per schedule. After 3 consecutive injections (at 6 weekly intervals) her BCVA improved to 6/18. FFA showed no leakage from the CNVM and OCT demonstrated resolution of the intraretinal fluid with a central macular thickness of 238 μ .



Case 1: Colour fundus photograph shows presence of CNVM secondary to macular telangiectasia



Case 1: FFA showing intense leakage from CNVM and corresponding OCT demonstrating fusiform irregularity at the retinal pigment epithelium / retinal outer layer level along with intraretinal fluid



Case 1: After completion of treatment, FFA shows no leakage from CNVM and corresponding OCT shows absence of intraretinal fluid.

Results

Four eyes of 4 patients with subretinal neovascularization secondary to IMT were included in this study (Table 1). The average age of the patients was 57.7 years with a range of 45–66 years. There were 3 female patients and one male. All patients had type 2A IMT involving both eyes with CNVM in only one eye. One patient was diabetic with no evidence of retinopathy. The patients were followed-up for a mean period of 5.2 months (range 3–8 months).

Demographic Data

Patient	Age/Sex	No of inj	FU (in months)
1	45 / F	3	5
2	55 / M	2	8
3	65 / F	2	3
4	66 / F	3	5

Table 1

Visual improvement: BCVA at the start of treatment was 6/60 in 2 patients, 6/36 in one and 6/24 in one patient. BCVA improved to 2 or more lines in 3 patients (75%) and remained same in 1 (25%).

Structural improvement: Mean central macular thickness improved from 302 microns (256-345 microns) to 215 microns (210 - 238 microns). FFA showed reduced leakage in all 4 eyes. Average number of injections required was 2.5. No complication or adverse effect related to the intervention was observed.

BCVA before and after intervention

Patient	BCVA before intervention	BCVA after intervention
1	6/36	6/18
2	6/60	6/18p
3	6/60	6/24
4	6/24	6/24

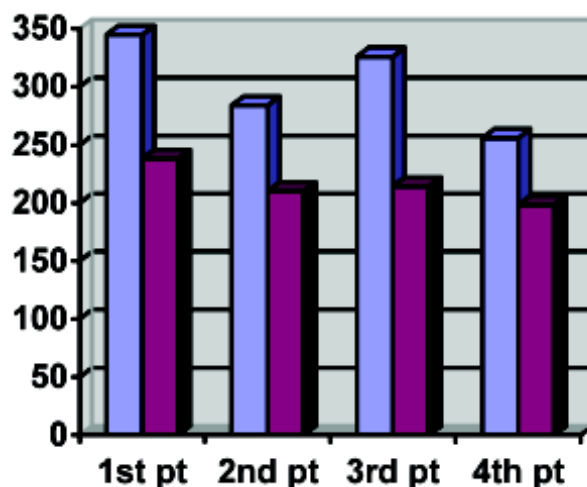


Chart Showing: Central Macular Thickness (by OCT) before and after intervention

Patient	CMT before intervention	CMT after intervention	Changed in CMT	Mean change
1	345	238	107	87.75
2	284	210	74	
3	326	214	112	
4	256	198	58	

Central Macular Thickness (by OCT) before and after intervention

Discussion

Treatment options for CNVM complicating macular telangiectasia include laser photocoagulation, intravitreal trimcinolone acetonide, submacular surgery, transpupillary thermotherapy (TTT) and photodynamic therapy (PDT).⁶ Laser photocoagulation of extrafoveal CNVM complicating IMT will result in scotoma close to fixation, while TTT is nonselective and will cause damage to RPE.⁷ Submacular surgery generally resulted in poor post-treatment visual outcome⁸ as the process is difficult to perform due to intimate adherence of the membrane with the overlying neurosensory retina in the area of retinochoroidal anastomosis. PDT for CNVM in IMT has also been reported to cause RPE damage corresponding to laser spot, thereby compromising visual recovery.⁹ In a study reporting PDT for treatment of CNVM complicating PFT, Snyers et al found that three out of four eyes maintained baseline vision following treatment while one eye had further deterioration of vision even after multiple sessions of PDT.¹⁰

It has been hypothesized that VEGF may play an essential role in the pathogenesis of macular telangiectasia.¹¹ Also VEGF has been implicated as the major angiogenic stimulus responsible for neovascularization in IMT, thereby suggesting a role of antiVEGF treatment in these patients.¹² Rodrigo Jorge found absence of leakage from CNVM along with gradual contraction of neovascular lesion and resolution

of subretinal fluid over a 24 week follow up period following intravitreal bevacizumab in CNVM associated with parafoveal telangiectasia.¹³ Mandal S et al reported a series of 6 cases where BCVA improved 2 or more lines in 83%, and there was an average reduction of central macular thickness by 62 μ . 5 patients required 1 injection and 1 patient required 2.¹⁴ In our study, improved BCVA of 2 or more lines was seen in 75% and average reduction of CMT was 87.5 μ . 2 patients required 2 injections and 2 patients required 3 injections: the average number of injections was 2.5. All the eyes showed anatomical improvement following completion of treatment. There was absence of leakage from the CNVM by FFA as well as resolution of the CNVM complex with resolution of SRF / intraretinal fluid by OCT.

The limitations of this study were that it was retrospective in design and this was too small a sample size. Also, the mean follow up period was about 5 months. Encouraging results seen in this study warrants further long term investigation with bevacizumab in a larger sample size. Besides a comparative study between bevacizumab and other antiVEGFs can also be contemplated regarding CNVM due to IMT.

Conclusion

Intravitreal bevacizumab seems to be a safe and effective treatment for CNVM due to IMT. But a larger, randomized controlled study is necessary to substantiate further the encouraging results that were achieved in this study.

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