INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

Optical Coherence Tomography Findings and Visual Outcome after Treatment with Intravitreal Bevacizumab in Parafoveal Telangiectasia

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Abstract:
Methods: A prospective interventional study of 40 patients (80 eyes) with bilateral parafoveal telengectiasis. They were divided into three groups. Group 1 which included 15 patients with PFT were under observation and treated conservatively. Group 2 included 14 patients with PFT complicated by cystoid macular oedema who were treated with intravitreal injection of bevacizumab each (0.1 ml) under aseptic conditions. Group 3 included 11 patients with PFT and choroidal neovascular membranes who were treated with intravitreal injections of bevacizumab. In the three groups pre interventional and post interventional visual acuities were recorded. Pre and post intervention macular thickness was recorded by optical coherence tomography (OCT).Results: In group 1 mean vision at presentation was 0.264 ± 0.14decimals which was exactly the same as the mean vision (0.264 ± 0.14) after three months. The mean macular thickness was the same before and after three months. In Group 2 the mean vision at presentation was 0.19 (approx 6/18) significantly improved to 0.256 (6/12) ± 0.096 following bevacizumab injection. The mean macular thickness at presentation was 360.73 ± 43.22μ which showed significant decrease to 253.45 ± 32.6μ following the injection. In Group 3 the mean vision at presentation was 0.13(approx 6/60) ± 0.08 decimals after bevacizumab injection was 0.15 (6/36) ± 0.07 the difference was not statistically significant. The mean macular thickness at presentation was 469.17 ± 89.6μ which showed a significant decrease to 310.78±85.61μ following the injection. Conclusion: In patients with parafoveal telengiectasis alone the mean visual acuity and mean macular thickness are better than in patients with PFT complicated with CME and choroidal neovascular membranes. In patients with PFT complicated by CME there is definite short term improvement in visual acuity and in macular thickness following injection of bevacizumab.In patients with PFT complicated by CNVM there is definitely short term improvement in macular thickness but not in visual acuity following intravitreal injection of bevacizumab.

Keywords: *Parafoveal telengectasia, Bevacizumab, cystoid macula oedema (CME), choroidal neovascular membrane (CNVM)*

1. Introduction

Parafoveal telangiectasis was first described by Gass, who observed that the parafoveal retinal capillaries only showed telangiectasia; fluorescein angiography was required to diagnose these cases. since the capillaries affected are confined to the juxtafoveal region. Telangiectasis of parafoveal capillaries could either be idiopathic or secondary to a number of retinal vascular disorders or systemic diseases. The idiopathic form further could be either (a) developmental which is usually seen unilaterally in males (spectrum of Coats' disease); or (b) acquired which tends to present bilaterally without any gender predilection. These are further subdivided according to the revised classification of Gass and Blodi. Type 2 parafoveal telangiectasia is the form most commonly encountered.
Parafoveal Telangiectasis is classified as:

- Group1A - Unilateral congenital juxtafoveal telangiectasis;
- Group1B - Unilateral idiopathic juxtafoveal telangiectasis;
- Group 2A - Adult, bilateral, idiopathic, acquired juxtafoveal telangiectasis;
- Group 2B - Juvenile, occult, familial, idiopathic, juxtafoveal telangiectasis;
- Group 3A – Occlusive, idiopathic, juxtafoveal retinal telangiectasis; and
- Group 3B – Occlusive, idiopathic, juxtafoveal retinal telangiectasis associated with central nervous system vasculopathy.

Patients typically present in the fifth and sixth decades of life with mild blurring of vision in one or both eyes which may progress, primarily from foveolar atrophy or subretinal neovascularization.[4] Biomicroscopy reveals symmetric blunting of the foveal reflex with a mild grayish appearance of the parafoveal retina, minimal serous exudation, and no lipid deposition.[4,5] In addition, glistening white or yellow-white crystalline deposits may be noted in the superficial parafoveal retina in approximately 40% of patients.[6] In some patients, a small, yellow lesion, 1/3 disk diameter in size, develops within the foveal avascular zone and appears to represent an inner retinal cavitation on evaluation by optical coherence tomography (OCT). [4,5]
Initially, telangiectasis is not visible on biomicroscopy, and fluorescein angiography shows only mild staining within one disk diameter of the foveola, especially temporally. With progression, these eyes may develop dilated right-angled retinal venules and arterioles, and stellate plaques of retinal pigment hyperplasia, as well as intra-and subretinal anastomosis and subretinal neovascularisation occur.[25,26,27]- Loss of central visual acuity may be rapid, and 81% of untreated eyes have a final acuity of 20/200 or worse.

2. Aim of the Study
To document the optical coherence tomographic (OCT) findings in patients presenting with type 2 parafoveal telangiectasia at a tertiary eye care facility.
To evaluate the effect of intravitreal bevacizumab in treatment of type 2 parafoveal telangiectasia.

3. Patients and Methods
Eighty eyes of forty patients (14 males and 26 females), ranging in age from 40 to 70 were included in the study. All patients were first informed of the procedure, and the possible complications and informed written consent was obtained. The Institutional Ethics Committee (Institutional Review Board) approved the study.
Patients included in the study were divided into three groups for follow-up and treatment.

- Group 1: eyes with PFT treated conservatively
- Group 2: eyes with PFT receiving intravitreal bevacizumab
- Group 3: eyes with PFT and CNVM receiving intravitreal bevacizumab

All patients were followed up at 1 week, 1 month and 3 months after initial examination or intervention.

4. Inclusion Criteria
Patients with clinical diagnosis of PFT Type 2
Media clarity adequate to perform FFA and OCT
Follow up of at least 3 months

5. Exclusion Criteria
Patients with other retinal pathology affecting visual acuity
Patients with hazy media where FFA and OCT could not be performed
Patients who did not complete follow up for three months
The parameters checked after intervention included:

i. Measurement of BCVA;
ii. Slit-lamp examination;
iii. Fundus examination and photography;
iv. Measurement of IOP
v. OCT

6. Results
Eighty eyes of forty patients were enrolled in the study. Of these 40 patients, fourteen were males (35%) and twenty six were females (65%) . The patient age ranged between forty to seventy years. (Mean age of 54.16 ± SD 8.25 years).

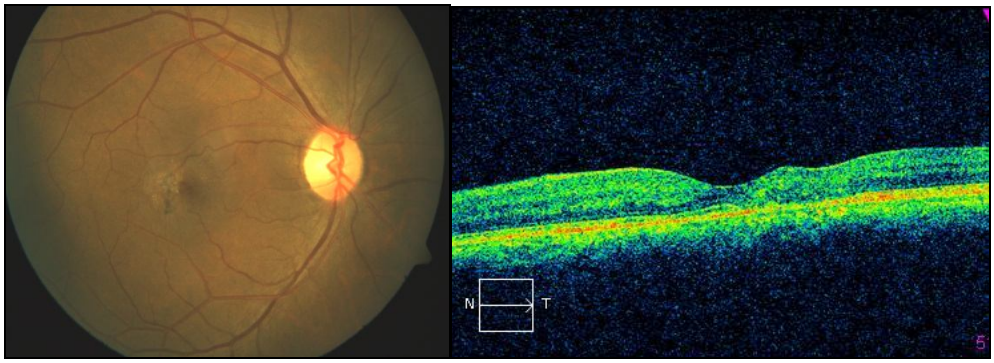

Figure 1: Fundus Picture and OCT appearance of parafoveal telengectasia

All the forty patients enrolled in the study suffered from bilateral parafoveal telangiectasia. They were divided into three groups:
Group 1: This group included patients with PFT who were under observation and treated conservatively. Out of 15 patients in this group, three were males and twelve were females. The mean vision at presentation was 0.26 decimals, which was similar to the mean vision after three months follow-up period. The mean macular thickness at presentation was 205.8 µ which also showed no change after the three month follow-up period.
Group 2: This group included fourteen patients with PFT with CME who were treated with an intravitreal injection bevacizumab (0.1) ml under aseptic precautions. Out of 14 patients, five were males and nine were females.The mean vision at presentation was 0.19decimals (6/18).After the injection there was significant improvement to0.25decimals (6/12)(P=0.002) The mean macular thickness at presentation was 360.72µ which, when compared to the post-bevacizumab macular thickness showed significant decrease to 253.45µ (P<0.001) .None of the patients exhibited decreased visual acuity after intravitreal injection of bevacizumab. Six eyes did not show any change in visual acuity, but showed a significant reduction in macular thickness.

6.1. Comparison of Pre and Post Oct and Visual Acuity in PFT Only in 30 Eyes

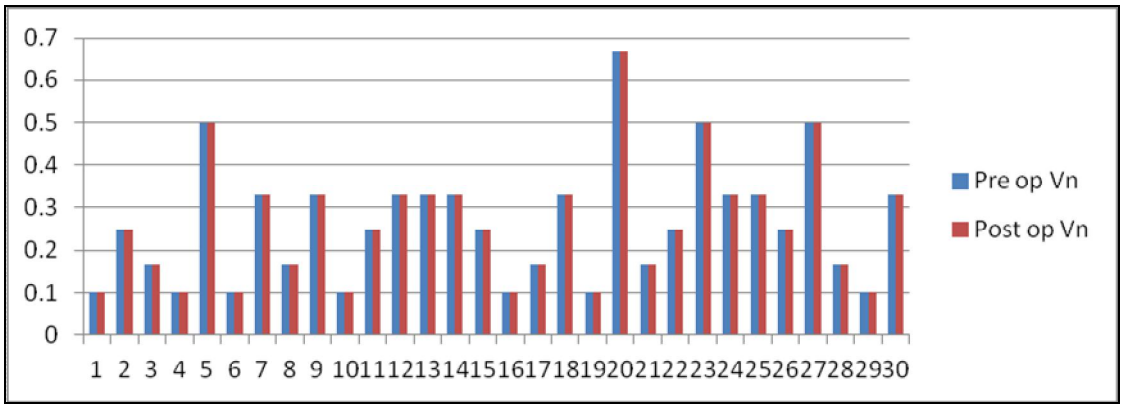

Figure 2

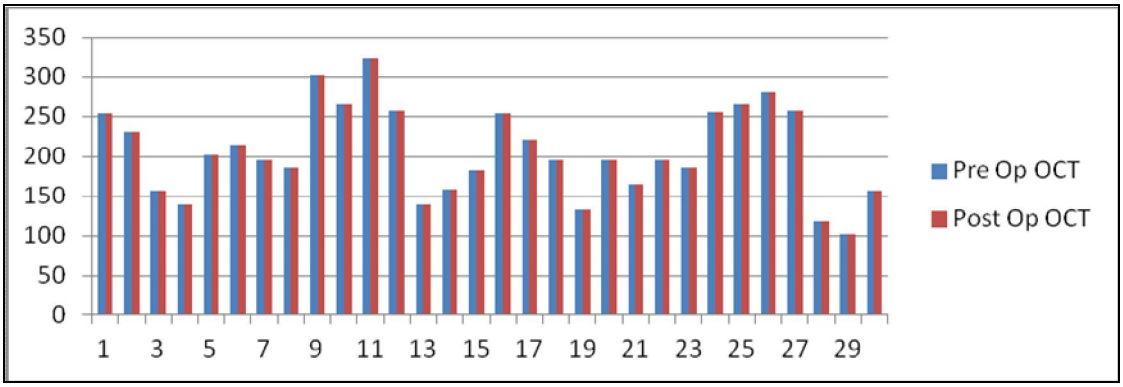

Figure 3

6.2. Comparison of Pre and Post Oct and Visual Acuity in PFT with CME in 22 Eyes

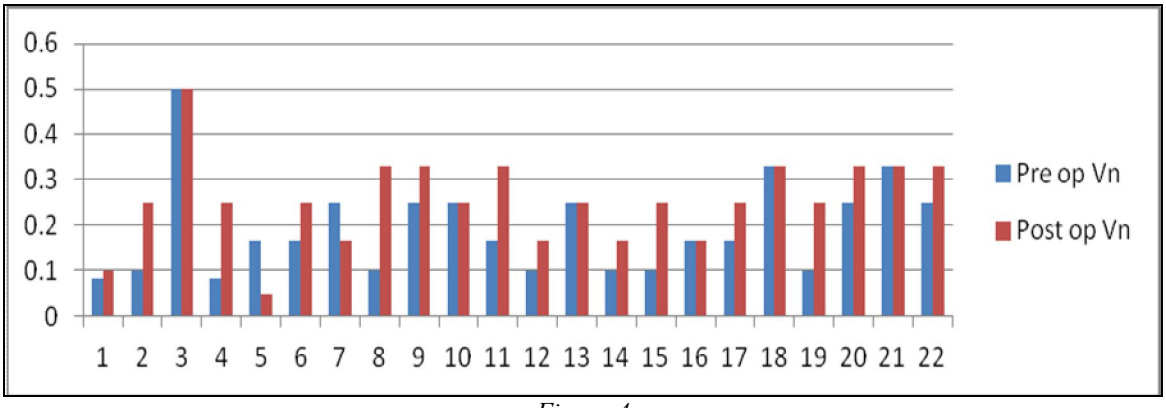

Figure 4

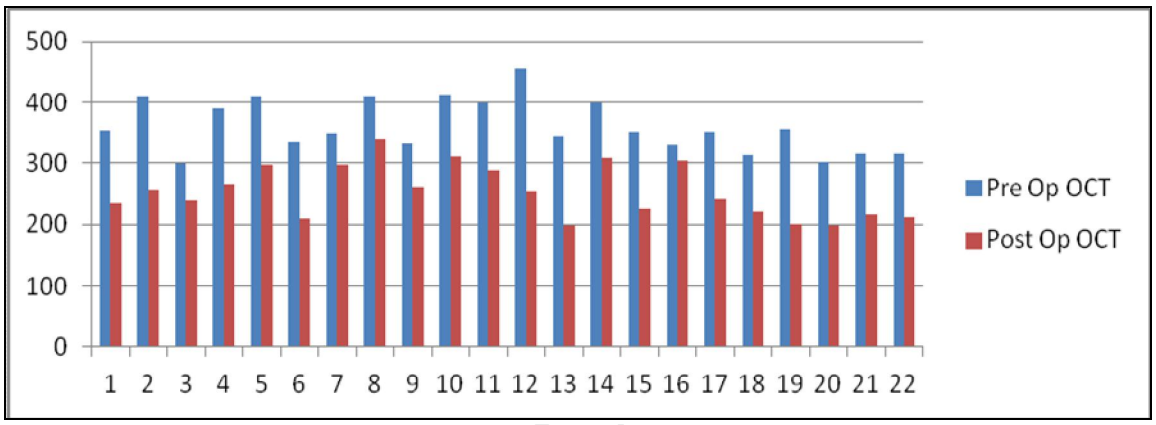

Figure 5

6.3. Comparison of Pre and Post Oct and Visual Acuity in PFT with CNVM in 18 Eyes

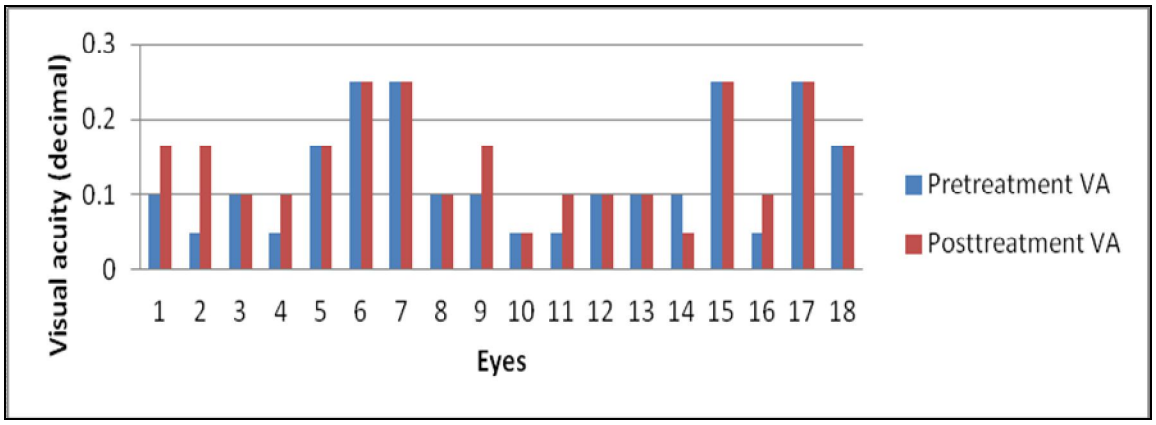

Figure 6

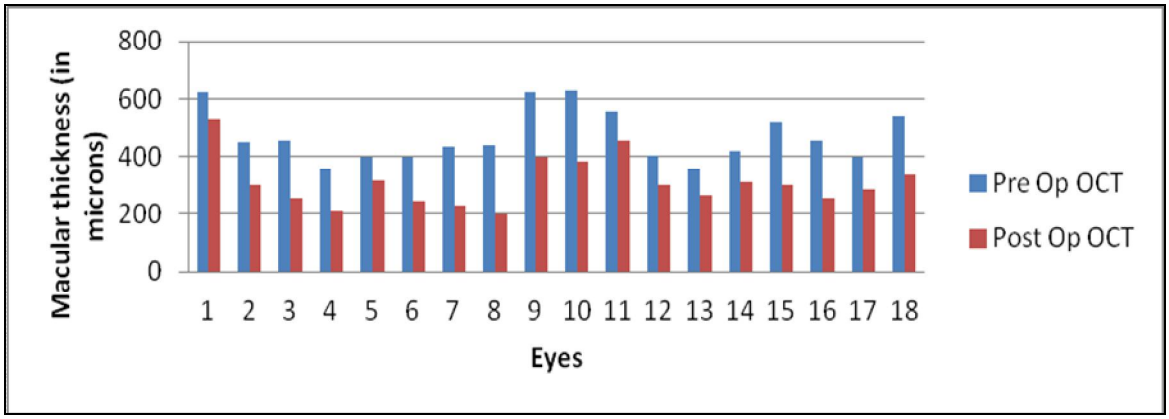

Figure 7

Group 3: This group included 11 patients with PFT and CNVM who were treated with an intravitreal injection of bevacizumab (0.1) ml under aseptic precautions. Of these 11 patients six were males and five were females. The mean vision at presentation was 0.127 ± decimals (approximately 6/60) which when compared with post-bevacizumab vision of 0.146 ± (approximately 6/36) did not represent a statistically significant improvement. The mean macular thickness at presentation was 469.17µ while the post-bevacizumab macular thickness showed considerable reduction to 310.78µ ($P<0.001$). One patient showed a decreased visual acuity form 6/60 to 3/60; however, macular thickness showed a reduction from 417µ to 313µ. Eight eyes did not exhibit any change in visual acuity, but showed a significant reduction in macular thickness.

6.4. Statistical Analysis of the Three Groups

Parameter	Group 1	Group 2	Group 3
Age	52.73±9.05 (15 patients)	53.5±7.18 (14 patients)	56.27±8.50 (11 patients)
Pre-intervention Visual acuity	0.264±0.14 (30 eyes)	0.193±0.1 (28 eyes)	0.127±0.08 (22 eyes)
Post-intervention Visual acuity (decimals)	0.264±0.14 (30 eyes)	0.256±0.096 (28 eyes)	0.146±0.07 (22 eyes)
Pre-intervention Macular thickness (μ)	205.8±56.32 (30 eyes)	360.73±43.32 (28 eyes)	469.17±89.67 (22 eyes)
Post- intervention Macular thickness (μ)	205.8±56.32 (30 eyes)	253.45±42.6 (28 eyes)	310.78±85.61 (22 eyes)

Table 1

Statistical analysis of the difference between the 3 groups
1. Age. One way analysis of variance (ANOVA); Fisher `f' value= 0.614; P= 0.546 (not significant).
2. Pre intervention visual acuity. One way (ANOVA); Fischer 'f' value=11.018; P=0.000 (significant)
Post hoc testing (Turkey's).Group I vs II;q=11.186;P<0.001(significant)
Group I vs III;q=5.8;P<0.01(significant)
Group II vs III;q=-5.38;P<0.01(significant)
3. Post intervention visual acuity. One way (ANOVA); Fischer 'f' value=10.329; P=0.000(significant)
Post hoc testing (Turkey's).Group I vs II;q=0.653;P>0.05(not significant)
Group I vs III;q=9.363;P<0.001(significant)
Group II vs III;q=8.98;P<0.001(significant)
4. Pre intervention macular thickness.One way (ANOVA); Fischer 'f' value=112.4; P=0.000
Post hoc testing (Turkey's).Group I vs II;q=20.6;P<0.0001
Group I vs III;q=35.0;P<0.0001
Group II vs III;q=14.42;P<0.001
5. Post intervention macular thickness.One way (ANOVA); Fischer 'f' value=18.753; P=0.000
Post hoc testing (Turkey's).Group I vs II;q=6.53;P<0.01
Group I vs III;q=14.38;P<0.001
Group II vs III;q=7.85;P<0.01

7. Discussion

Type 2 parafoveal telengectasia is the most common type of parafoveal telengectasia. It is acquired, not congenital. Affected patients are middle-aged or older (mean 55 years). Males and females are affected equally. This disorder is bilateral, but may be asymmetric appearing as unilateral in its early stages. Similarly, patients may have visual loss in only one eye.

Matsumoto et al. [36] investigated the efficacy of intravitreal bevacizumab for the treatment of idiopathic macular telangiectasia (IMT). Ten eyes of eight consecutive patients with IMT were studied. All patients were treated with intravitreal bevacizumab (1.25 mg) injections at baseline. There were no changes in the mean visual acuity in either eye in any of the patients. These authors concluded that type 2 IMT improved anatomically with bevacizumab treatment, despite a lack of improvement in vision, and bevacizumab effectively decreased vascular permeability and retinal edema in the short term.

Moon et al.[40] assessed the potential visual benefit of intravitreal bevacizumab in a patient with idiopathic juxtafoveal retinal telangiectasis refractory to focal laser treatment; an intravitreal injection of bevacizumab (1.25 mg) was given. Within 1 week, visual acuity improved from 20/50 to 20/25 and OCT demonstrated complete resolution of macular edema without any adverse effect due to the injection. The macular edema recurred after 3 months, requiring a repeat injection of bevacizumab, with subsequent resolution of macular edema. These authors believed that an intravitreal injection of bevacizumab may provide potential short-term visual benefit in patients with macular edema from idiopathic juxtafoveal retinal telangiectasis.

In our study, in patients with parafoveal telangiectasis alone, the mean visual acuity and mean macular thickness values are better than the same values in patients with parafoveal telangiectasis complicated by cystoid macular oedema or by choroidal neovascular membrane; There were neither short-term improvement nor deterioration in these parameters when the patients with parafoveal telangiectasis alone are managed conservatively. In patients with parafoveal telangiectasis complicated by cystoid macular oedema there is definite short-term improvement in the visual acuity and in the macular thickness following intravitreal injection of bevacizumab. In patients suffering from parafoveal telangiectasis complicated by choroidal neovascular membrane, there is definite short-term improvement in the macular thickness, but not in visual acuity, following intravitreal injection of bevacizumab. Further studies of a longer duration and on a larger sample size of patients are required to confirm these initial results.

8. References

i. Reese AB. Telangiectasis of the retina and Coats' disease. AMJ Ophthalmol 1956;42:1-8
ii. Gass JDM. A fluorescein angiographic study of macular dysfunction secondary to retinal vascular disease. V. Retinal telangiectasis. Arch Ophthalmol 1968;80:592-605.
iii. Gass JDM, Blodi BA. Idiopathic juxtafoveolar retinal telangiectasis: update of classification and follow-up study. Ophthalmology 1993;100:1536-1546.
iv. Gass J, Blodi B: Idiopathic juxtafoveolar retinal telangiectasis. Update of classification and follow-up study. Ophthalmology 1993;100:1536-1546.
v. S.J. Moon et al Intravitreal bevacizumab for macular edema from idiopathic juxtafoveal retinal telangiectasis. Ophthalmic Surg Lasers Imaging. 2007 Mar-Apr;38(2):164-6.
vi. M Cakir et al Intravitreal Bevacizumab Treatment of Retinal Telangiectasis Complicated By Subretinal Neovascularization. Retinal Cases & Brief Reports: Spring 2008 – Volume 2 – Issue 2 –pp 141-144.
vii. Spaide RF, Chang LK, Klancnik JM, Yannuzzi LA et al. Intravitreal bevacizumab (Avastin) for subretinal neovascularization secondary to type 2A idiopathic juxtafoveal telangiectasia. Graefes Arch Clin Exp Ophthalmol. 2007 Dec; 245(12):1825-9. Epub 2007 Mar 8.
viii. Charbel Issa P, Finger RP, Holz FG, Scholl HP. Eighteen-month follow-up of intravitreal bevacizumab in type 2 idiopathic macular telangiectasia. British journal of Ophthalmology. 2008 July ; 92 (7) :941-5.
ix. Surguch V, Gamulescu MA, Gabel VP. Optical coherence tomography findings in idiopathic juxtafoveal retinal telangiectasis. Graefes Arch Clin Exp Ophthalmol. 2007;245:783–8.
x. Paunescu LA, Ko TH, Duker JS, Chan A, Drexler W, Schuman JS, et al. Idiopathic juxtafoveal retinal telangiectasis: New findings by ultrahigh-resolution optical coherence tomography. Ophthalmology. 2006;113:48–57.
xi. Moon SJ, Berger AS, Tolentino MJ, Misch DM. Intravitreal bevacizumab for macular edema from idiopathic juxtafoveal retinal telangiectasis. Ophthalmic Surg Lasers Imaging. 2007;38:164–6.