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Outcome of Management of Central Serous Chorioretinopathy

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Abstract

This case series study on central serous chorioretinopathy (CSCR) was conducted, from April 2022 to October 2022, to assess the efficacy of laser photocoagulation and AntiVEGF in central serous chorioretinopathy. This study included all patients presented with CSCR in Bangladesh Eye Hospital, Uttara, Dhaka, a tertiary specialized private eye hospital in Bangladesh. These cases were diagnosed clinically and confirmed by fundus fluorescence angiogram and optical coherence tomography. The main features evaluated were corrected visual acuity, associated findings and complications after laser or AntiVEGF injection, if any. Other data included were age, gender, laterality of eyes, risk factors, and types of leaking. Twenty-eight cases were selected after thorough evaluation; focal laser was performed in 16 indicated cases, and intravitreal AntiVEGF (Bevacizumab) were given 4 cases of subfoveal leak central serous chorioretinopathy after 4-month observation. Post-intervention follow-up schedules were one week, one month and three months. Out of 28 cases, 7 were central serous chorioretinopathy with a sub-foveal leak in the angiogram. Among those, 10 cases were presented with central serous chorioretinopathy with pigment epithelial detachment. After three months of follow-up, subretinal fluid disappeared in 14 cases out of 16 cases of laser. Spontaneous resolution occurred in 7 cases. One patient was presented with RPE tracking. Age limits were extended from 22 to 48 years, and most were in the third decade. Central serous chorioretinopathy is most commonly present without any specific cause. Due to professional demand, most causes need intervention, which will result in fruitful visual acuity improvement with reduced subjective contrast.

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Introduction

Central serous chorioretinopathy (CSCR) causes serous retinal detachment in the macular region due to changes in the blood-aqueous barrier at the retinal pigment epithelium (RPE) level. This non-inflammatory condition is self-limiting and of unknown cause.[1,2] Fluorescein angiography shows an abnormal focal defect in the RPE, leading to fluid leakage into the subretinal space.

Fundus fluorescein angiography can show three characteristic patterns: expansile dot, smokestack, and diffuse with dye pooling in the subretinal space.[3,4] Optical coherence tomography (OCT) can detect shallow retinal detachment and subretinal fluid.[5-8] The disease typically follows a mild course, and most cases of CSCR resolve independently with minimal or no lasting vision troubles. Treatment is reserved for those who show no signs of improvement after 4-6 weeks or have frequent recurrences, leading to significant residual visual disturbance due to RPE

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atrophy and choroidal neovascularization.[9-11] Our study aims to evaluate the effectiveness of laser photocoagulation and anti-VEGF injection for central serous chorioretinopathy in a tertiary specialized private eye hospital in Bangladesh.

Methods

Twenty-eight cases of central serous chorioretinopathy (CSCR) were presented to Bangladesh Eye Hospital, Uttara, Dhaka, Bangladesh, from April 2022 to October 2022. These cases were diagnosed clinically by dome-shaped inward elevation of the neurosensory retina in the posterior pole of the retina without any sign of inflammation and confirmed by fundus fluorescence angiogram and optical coherence tomography. After a thorough evaluation, a Focal laser was performed in 16 indicated cases, and intravitreal AntiVEGF (Bevacizumab) was given 4 cases of subfoveal leak central serous chorioretinopathy after a 4-month observation. Post-intervention follow-up schedules were one week, one month and three months. The main features evaluated are presenting best corrected visual acuity, associated findings and best corrected visual acuity and complications after laser or AntiVEGF injection. Other data, including age, gender, laterality of eyes, risk factors, and types of leaking, were also recorded.

The study included patients with pigment epithelium detachment, sensory neuro-retinal detachment, or a combination of both. Patients with anterior segment pathology that could affect the evaluation of the posterior segment in cases of central serous choroidopathy were included. Patients with optic disc pit, sub-retinal neovascular membrane (SRNVM), and choroidal mass were excluded. Fundus fluorescein angiography (FFA) is the gold standard for diagnosing and treating CSCR. Patients underwent fundus fluorescein angiography (FFA) after providing consent. Laser treatment was administered for quick recovery if leakage was found in the extrafoveal region. In cases of subfoveal leakage, anti-VEGF injection was given for rapid recovery in 4 cases. Argon green focal laser photocoagulation was performed using a Zeiss laser 532 nm machine with a Mainster standard lens. The laser protocol used a 100 µm spot size, 80 to 100 mW power, and 0.10-second exposure. One to three burns were placed at the leaking point. Patients were followed up after one week and then once a month for three months, with BCVA and a stereoscopic fundus examination performed at every visit. Repeat OCT was done after three months of the procedure. The study received ethical clearance from the Institutional Review Board of Bangladesh Eye Hospital, Uttara, Dhaka, Bangladesh.

Results

Our patients' age ranged between 22 and 48 years, with a most frequency in found in the 31-40 years age group. Out of the 28 patients, 26(92.86%) were male and 2(7.14%) were female. 24(85.72%) of the patients were service holders, while 2(7.14%) were homemakers and 2(7.14%) reported business as their occupation (Table-I). Out of 28 cases, 7 were central serous chorioretinopathy with a subfoveal leak in the angiogram. Among those, 10 cases were presented with central serous chorioretinopathy with pigment epithelial detachment. Spontaneous resolution occurred in 7 cases. One patient was presented with RPE tracking. After three months of follow-up, subretinal fluid disappeared in 14 cases out of 16 cases of laser. We used an

intravitreal injection of antiVEGF in case of 4 cases where there was recurrent macular oedema with a nonspecific leaking point in fundus fluorescence angiogram or a subfoveal leak where the laser was not appropriate. Fig. 1-3 are showing the subsequent changes after laser or AntiVEGF injection treatment in our patients.

Table-I: Demographic characteristics of the patients (N=28)

Variables	Frequency	Percentage
Age		
21-30 years	4	14.28
31-40 years	18	64.29
41-50 years	6	21.43
Sex		
Male	26	92.86
Female	24	7.14
Occupation		
Service holder	24	85.72
Business man	2	7.14
Housewives	2	7.14

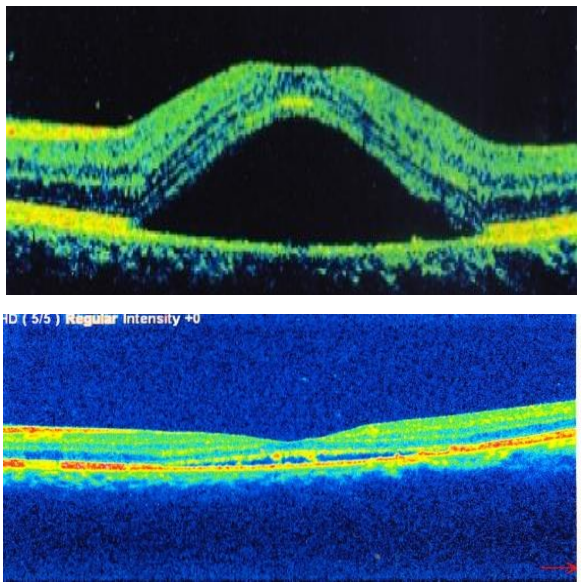
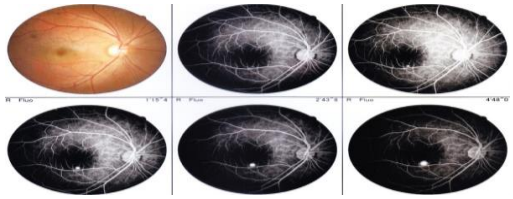


Fig: 1: (A) First-time attack of CSCR, after observation for six weeks **(B)** resolution of subretinal fluid, which causes improvement of Best-corrected visual acuity from 6/24 to 6/12.



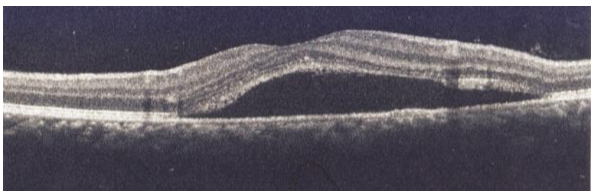


Fig: 2: (A) In this recurrent case, FFA shows ink blot pattern leakage in right eye, in which macular edema is confirm by OCT. Visual acuity was 6/18.

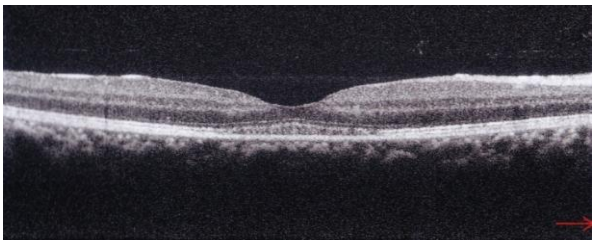
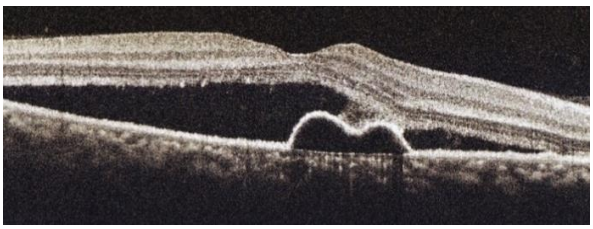


Fig: 2: (B) After application of focal laser, follow up for 6 weeks, there is complete resolution of subretinal fluid with vision improvement to 6/6.



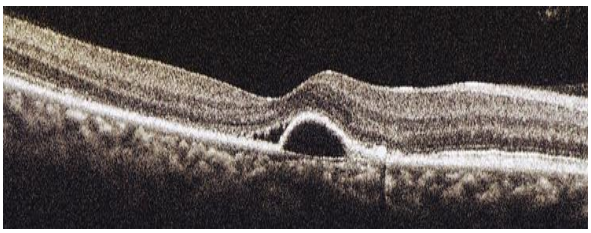


Fig: 3: (A) OCT reveal sub retinal fluid with pigment epithelial detachment, visual acuity 6/60; **(B)** 1 month after follow-up of laser application, resolution of subretinal fluid with improvement of visual acuity to 6/12.

Discussion

Central serous chorioretinopathy mainly affects young individuals aged 20-50. It typically resolves within three months, with 95% of patients recovering within 4-8 weeks. Recurrences are common in one-third to one-half of patients, with severe visual loss occurring in only 5% of cases. The disease is self-limiting, so no treatment is recommended initially. After waiting three months for spontaneous resolution, laser photo-coagulation of the leak can be done if the leak site is at least one-fourth disc diameter away from the fovea.[9-12] Other treatment options can be considered if no improvement is seen within the first three months. However, it's important to note that laser photocoagulation has limitations and carries a 2-5% risk of developing choroidal neovascularization after several months of treatment.[11-14]

Photocoagulation has shown beneficial effects in previous studies. A large study involved 139 untreated cases; 109 cases treated with photocoagulation. Patients of chronic CSCR had atrophic changes in the neurosensory layer of the retina, gross loss of the photoreceptor layer, and foveal atrophy.[9] Similar beneficial effects of photocoagulation have been reported in several studies.[11,13,14] These cases of chronic long-standing CSCR had atrophic changes in a neurosensory layer of the retina. There was gross loss of the photoreceptor layer and atrophy of the fovea.[15] The RPE cells absorb the laser energy, potentially stimulating diseased RPE cells to absorb excess fluid. Inadequate reaction was observed in 7(28%) cases during treatment.[15] In our study, spontaneous resolution occurred in seven cases. After three months of follow-up, SRF disappeared in 87.5% of cases who treated with laser photocoagulation. A study assessed the effectiveness of anti-vascular endothelial growth factors on CSR's functional and structural aspects in 339 eyes. Anti-VEGF therapy has been reported to significantly reduce macular thickness and resolve SRF in managing chronic CSR without side effects. Unfortunately, vision did not improve significantly with drug treatment.[16] Another study investigated the anatomic and functional outcomes of a single combined therapy session, including photodynamic therapy with verteporfin (PDT) and anti-VEGF, in patients with chronic central serous chorioretinopathy. Combined PDT and anti-VEGF treatment rapidly resolved macular neurosensory retinal detachment and improved vision, with no recurrences at 12 months.[17]

Conclusion

Central serous chorioretinopathy is most commonly present without any specific cause. Due to professional demand, most cases need intervention, which results in fruitful outcomes of improvement of visual acuity with reduced subjective contrast. Focal laser photocoagulation of the FFA leaking point results in rapid recovery and improved visual acuity. Intravitreal anti-VEGF is an effective alternative for managing recurrent, nonspecific leakage and chronic subfoveal leakage.

References

1. *Hussain D, Gass JD. Idiopathic central serous chorioretinopathy. Indian J Ophthalmol. 1998;46(3):131-7.*
2. *Jalali S, Gupta A, Jain IS, Ram J. Visual prognosis in central serous choroidopathy: residual amsler grid changes. Can J Ophthalmol. 1991;26:270-2.*

3. *Mutlak JA, Dutton GN. Fluorescein angiographic features of acute central serous retinopathy. A retrospective study. Acta Ophthalmol (Copenh). 1989;67(4):467-9.*
4. *Guyer DR, Pulia CA. Digital indocyanine green angiography in chorioretinal disorders. Ophthalmology. 1992;99:287-91.*
5. *Hee MR, Puliafito CA, Wong C, Reichel E, Duker JS, Schuman JS, et al. Optical coherence tomography of central serous chorioretinopathy. Am J Ophthalmol. 1995;120(1):65-74.*
6. *Lee H, Bae K, Kang S, Woo S, Han G. Morphologic characteristics of choroid in the major choroidal thickening diseases, studied by optical coherence tomography. PLoS One. 2016;11(1):e0147139.*
7. *Spaide RF. Questioning optical coherence tomography. Ophthalmology. 2012;119(11):2203-4.*
8. *Gloesmann M, Hermann B, Schubert C, Sattmann H, Ahnelt PK, Drexler W. Histologic correlation of pig retina radial stratification with ultrahigh-resolution optical coherence tomography. Invest Ophthalmol Vis Sci. 2003;44(4):1696-703.*
9. *Spitznas M. Central serous retinopathy. In: Ryan SJ. ed. Retina. St. Luis: CV Mosby: 1989.*
10. *Wang MS, Sanders B, Larsen M. Retinal atrophy in Idiopathic central serous chorioretinopathy. Am J Ophthalmol. 2002;133:787-93.*
11. *Wong R, Chopdar A, Brown M. Five-to-15-year follow-up of resolved idiopathic central serous chorioretinopathy. Eye. 2004;18:262-8.*
12. *Abu el-Asrar AM. Central serous chorioretinopathy complicating systemic corticosteroid therapy. Eur J Ophthalmol. 1997;7(3):297-300.*
13. *Lee GW, Kim YY, Choi KJ, Kang SW. Factors related to changes in visual symptoms after successful photodynamic therapy in central serous chorioretinopathy. PLoS One. 2023;18(4):e0284899.*
14. *Mathur V, Parihar J, Maggon R, Mishra SK. Role of Transpupillary Thermotherapy in Central Serous Chorio-Retinopathy. Med J Armed Forces India. 2009;65(4):323-7.*
15. *Lin D, Luo X, Meng L, Zhang G, Chen W, Chen H. Optical intensities of different compartments of subretinal fluid in acute Vogt-Koyanagi-Harada disease. PLoS One. 2016;11(2):e0149376.*
16. *Palakkamanil M, Munro M, Sethi A, Adatia F. Intravitreal anti-vascular endothelial growth factor for the treatment of chronic central serous retinopathy: a meta-analysis of the literature. BMJ Open Ophthalmol. 2023;8(1):e001310.*
17. *Arevalo JF, Espinoza JV. Single-session combined photodynamic therapy with verteporfin and intravitreal anti-vascular endothelial growth factor therapy for chronic central serous chorioretinopathy: a pilot study at 12-month follow-up. Graefes Arch Clin Exp Ophthalmol. 2011;249(8):1159-66.*