Research Article

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Non-Neovascular Subretinal Fluid with Serous Retinal Pigment Epithelial Detachment: Wait or Treat

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ABSTRACT

Introduction: *To describe the course of subretinal fluid (SRF) in eye with serous pigment epithelial detachment (serous PED) in the absence of macular neovascularization (non-neovascular AMD).*

Method: *This is a retrospective case study included one eye with non-neovascular SRF associated with serous PED. Swept source optical coherence tomography (SS-OCT) and optical coherence angiography (OCTA) were obtained at baseline and follow up with qualitative and quantitative analysis of macula, pigment epithelial detachment (PED), subretinal fluid (SRF) and the presence or absence of macular neovascular membrane (MNV) in addition to other multimodal imaging modalities like fluorescein angiography (FA) and fundus auto fluorescence (FAF).*

Results: *Our 66-year-old female has presented with left serous (PED) with apical (SRF) and no MNV on OCTA with baseline best corrected vision (BCVA) in Log MAR = 0.5. The SS-OCT, OCTA, and BCVA were stable over the initial five-month follow-up observation period with no MNV (non-neovascular SRF). One month later, the patient received an intravitreal anti-VEGF injection outside our clinic. 1-month post-outside clinic anti-VEGF injection, SS-OCT showed a small RPE tear with flattening of RPE detachment and preservation of BCVA =0.5. In the 3rd month post-outside clinic anti-VEGF injection, the SS-OCT showed slight flattening of RPE detachment with an obvious increase in SRF, still negative MNV on the OCTA associated with a drop in BCVA to 0.3. The decision was made to give the patient an initial three loading doses of aflibercept injections .The SS-OCT post 2nd aflibercept injection showed complete resolution and drying out of SRF, with an improvement of BCVA to 0.5. we continue completing the loading phase and then the patient was placed on treat and extend regimen (T&E). After the fifth aflibercept injection, the PED was completely flattened with appearance of MNV on OCTA after resolution of SRF.*

Conclusion: *Many published studies provide preliminary data about non-neovascular AMD with SRF. SRF could be present in the absence of MNV due to RPE decompensation or RPE pump failure. However, the non-neovascular SRF could be transformed with time into a neovascular one with the presence of MNV. Multimodal imaging approach is essential in differentiating non-neovascular versus neovascular SRF and avoiding unnecessary anti-VEGF injections.*

Keywords

Subretinal fluid, Biomarkers, serous PED, non-neovascular AMD.

Introduction

Subretinal fluid (SRF) has been considered as a biomarker of macular neovascular membrane (MNV) activity in wet AMD. Querques et al. noted the presence of SRF at the apex of an avascular serous pigment epithelial detachment (PED) in eyes with AMD [1]. Recent studies suggest that the presence of fluid does not always indicate neovascularization in AMD.

Hilely et al. [2] described several patterns of subretinal fluid (SRF)

associated with confluent soft drusen and drusenoid pigment epithelial detachment (PED) in eyes with non-neovascular AMD and the source of this SRF is being attributed to RPE pump failure. The aim of this short study case review is to describe the course of subretinal fluid (SRF) in the eye with serous pigment epithelial detachment (serous PED) in the absence of macular neovascularization (non-neovascular AMD).

Methods

This is a retrospective case study of 66 years old female, presented to our clinic with left eye blurred vision of 1-month duration.

BCVA was 0.5 in the left eye (OS) and 1.0 in the right eye (OD). SS-OCT, OCTA (OS): showed serous pigment epithelial detachment (serous PED) with apical subretinal fluid (Figure 1A) & no evidence of macular neovascular membrane (Figure 1B). FAF: showed hyper-autofluorescent macular drusen (Figure 1C).

Swept source optical coherence tomography (SS-OCT) and optical coherence angiography (OCTA) were obtained at baseline and follow up with qualitative and quantitative analysis of macula, pigment epithelial detachment (PED), subretinal fluid (SRF) and the presence or absence of macular neovascular membrane. Other multimodal imaging modalities like FAF & FA were included for analysis of AMD signs with SRF. Indocyanine green imaging modality was not available in JORDAN.

The patient underwent serial SS-OCT scans (Triton-Topcon) and OCTA 3x3 scans with manual adjustments and segmentation to detect any signs of neovascularization.

Results

In the initial 4 months of follow-up, the SS-OCT scans showed stable PED with stable apical SRF (Figure 2D-F) volume and no evidence of MNV on OCTA (Figure 3). However, in the 5th month of follow-up the SS-OCT showed slight flattening of RPE with change in the pattern of SRF and increase in the number of hyper-reflective foci (HF). As for vision, it remained stable BCVA=0.5.

One month later the patient took an intravitreal anti-VEGF injection outside our clinic in the left eye. SS-OCT image one month post outside clinic anti-VEGF injection showed RPE rip with unaffecting vision in the left eye (Figure 4).

3 months post outside clinic anti-VEGF injection, the patient came with further drop of vision to 0.3. SS-OCT (OS) showed further flattening of RPE detachment ,increased volume of SRF (Figure 5J) and no remarkable MNV biomarkers on OCTA or FA (Figure 5K-L).

Based on the new data, the decision was made to give the patient 3 loading doses of aflibercept. The risk of anti-VEGF enhancing effect on increasing RPE tear has been discussed with the patient.

The results were good after the 2nd aflibercept injection with complete clearance of SRF and improvement of vision to BCVA=0.5 (Figure 6M-O).

After the loading phase, the patient was placed on treat and extend regimen (T&E).Post the fifth aflibercept injection, the multiple SS-OCT radial scans showed flattening of RPE with surprisingly appearance of MNV on OCTA.

Fig.1-(A): SS-OCT that showing serous RPE detachment in the left eye with apical SRF,(B):OCTA with no evidence of MNV,(C)FAF showing hyper-autofluorescence macular drusen.

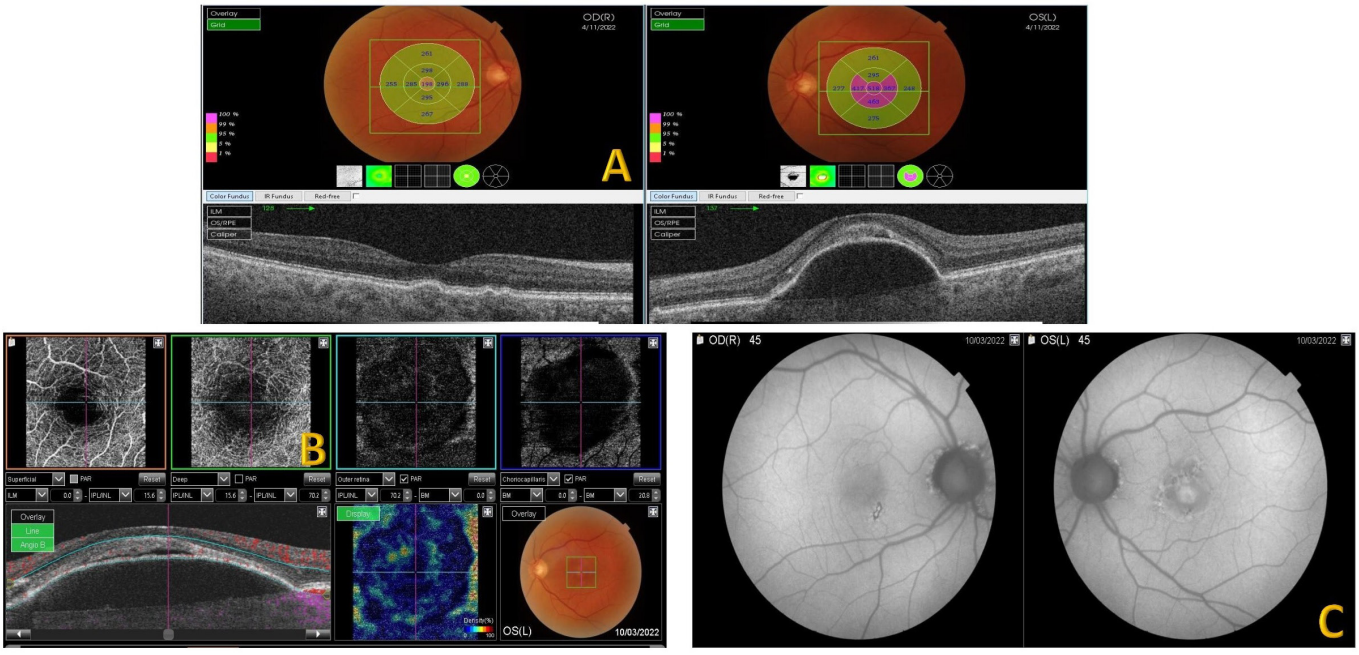


Fig.2-(D-F):Tracked SS-OCT compare scans during the first 4months of follow up that showed stable serous PED with no change in the apical SRF volume, (G):SS-OCT in the 5th month of follow -up that showed slight RPE flattening, change in the pattern of apical SRF with increased number of intraretinal of hyper-reflective foci (HF) .

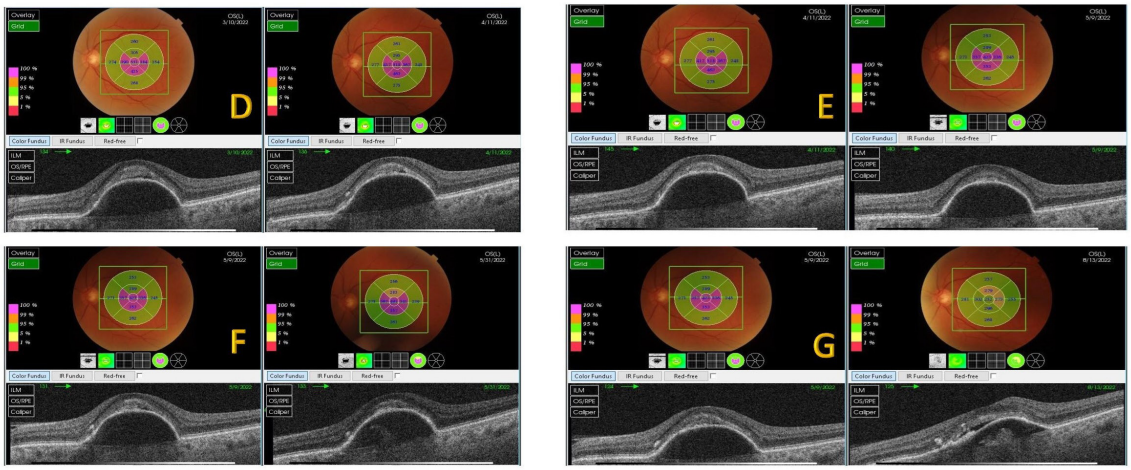


Fig.3-Serial OCTA scans during the first 5 months of follow-up with no evidence of MNV.

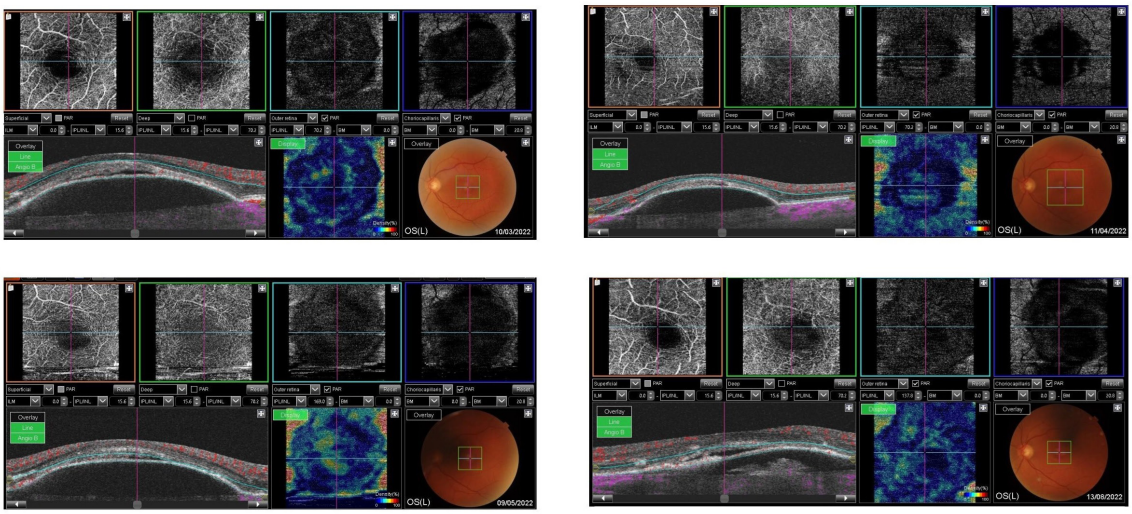


Fig.4- SS-OCT compare before (H) and after (I) (outside clinic Anti-VEGF injection) that showed a small RPE rip.

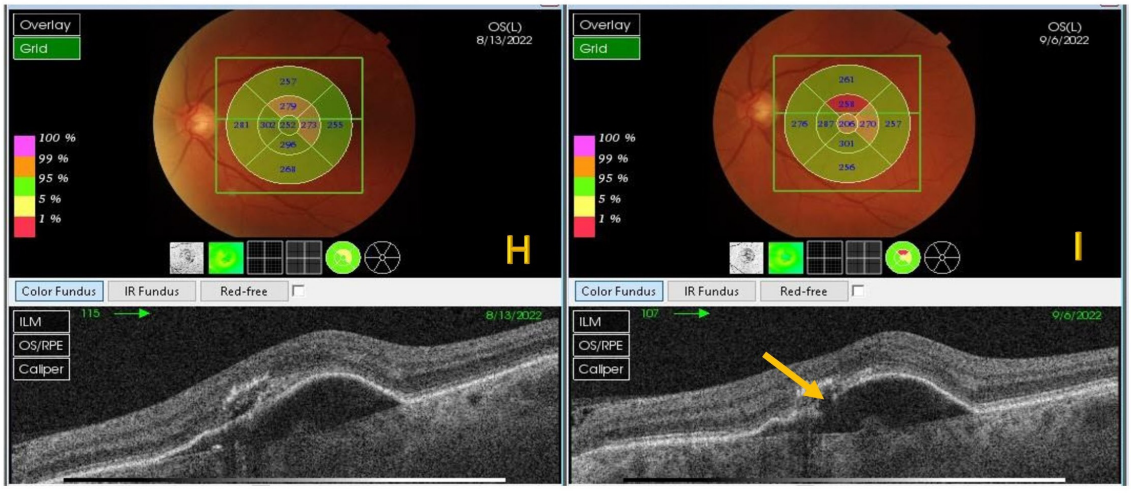


Fig.5- (J) SS-OCT compare 3months post outside clinic-anti-VEGF injection: showing flattening of RPE detachment with increase in the volume of SRF,(K,L) OCTA & FA that didn't show any clear MNV biomarkers.

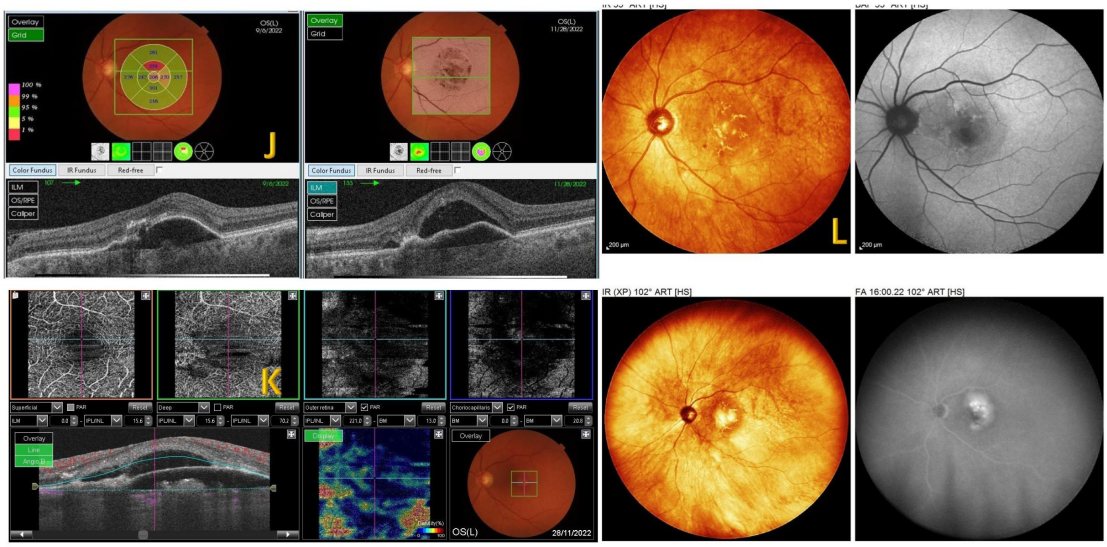
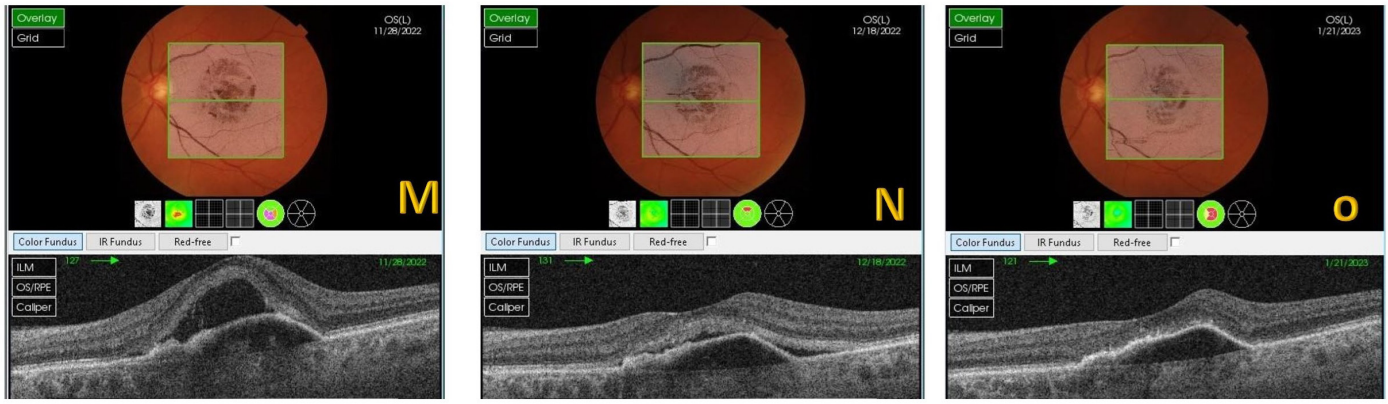


Fig.6- Serial SS-OCT scans before(M) , 1st month (N) & (O) 2nd month post aflibercept injection



Conclusion

In this case review study, we observed the course of SRF in eye with non-neovascular AMD. Many published studies provide preliminary data about non-neovascular AMD with SRF [2-7] as an important clinical entity that needs to be managed by observation and avoiding unnecessary anti-VEGF injection. However, some of these eyes may eventually develop MNV [2-5] that can be detected on multimodal imaging like OCT, OCTA & ICG. Careful monitoring to such cases is required to pick up earliest biomarkers of MNV.

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