

# Swept source optical coherence tomography in various causes of infectious retinitis

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## Background:

- Imaging the choroid and retina have been done by various authors using different types of OCT.
- Time domain OCT has a low signal to noise ratio and hence not useful in assessing choroidal thickness.
- Choroidal thickness in normal subjects was recently reported as  $287 \pm 76 \mu\text{m}$  (mean  $\pm$  SD) on the Spectralis and  $272 \pm 81 \mu\text{m}$  on the Cirrus device. (Margolis et al. and Manjunath et al.)
- Choroidal imaging characteristics may vary depending on the etiology of retinitis and there are very few studies on them.
- Increased thickness of the retina with thickening and disorganization of the choroid has been demonstrated in eyes with active ocular toxoplasmosis. (Oréfice et al.)
- We report the swept source optical coherence tomography (SS-OCT) findings in patients with infectious retinitis due to varied etiology (viral and toxoplasma)

## Patients & Methods:

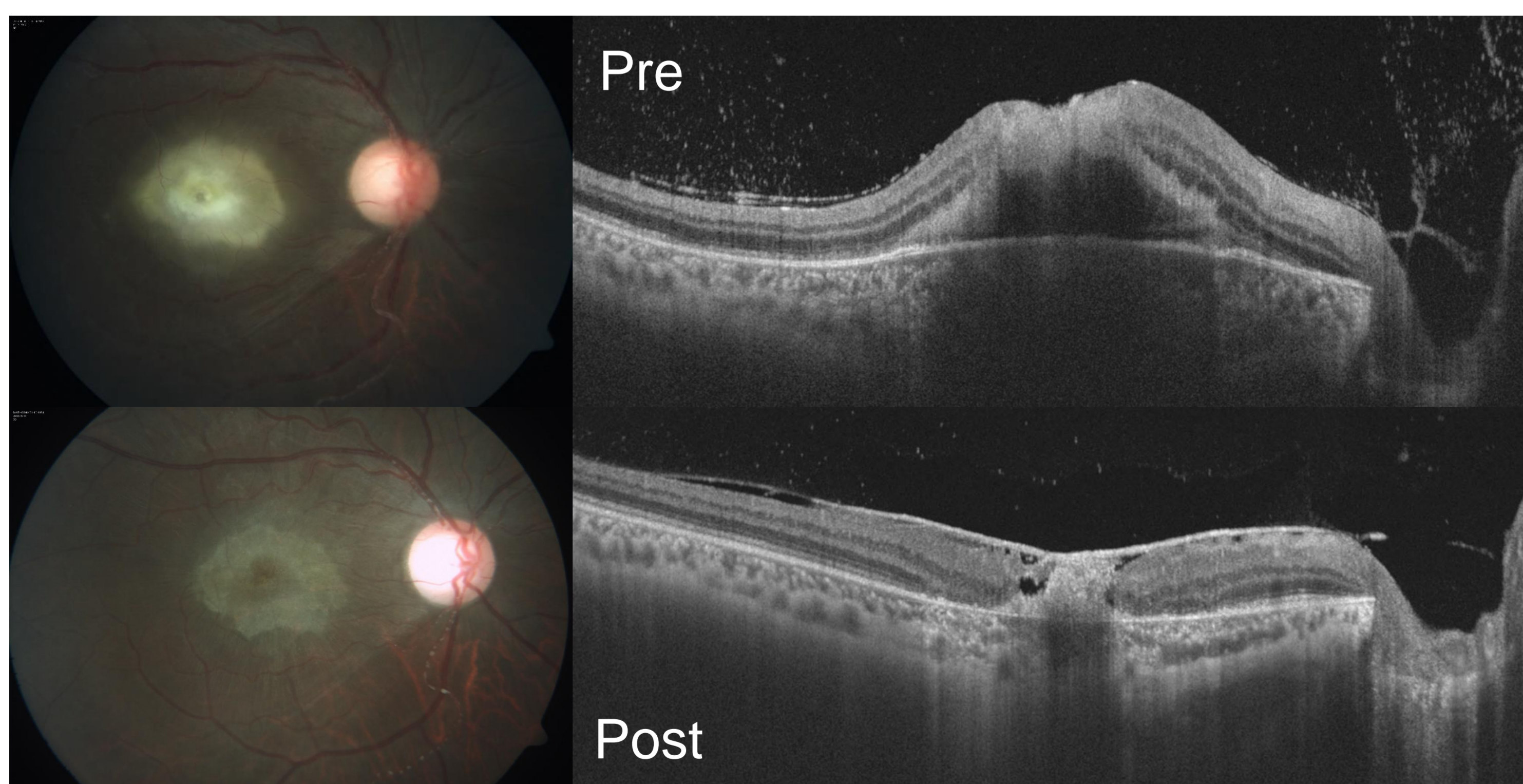
- Retrospective study of patients with infectious retinitis who underwent SS-OCT at baseline.
- Clinical and visual outcome, SS-OCT findings such as foveal thickness (FT) and sub-foveal choroidal thickness (SFCT) were analysed between different etiologies and between HIV positive and negative groups.

## Treatment protocol:

- All patients were treated with appropriate anti-infective therapy viz, triple therapy (cotrimoxazole, clindamycin and systemic steroids) for ocular toxoplasmosis, systemic acyclovir and ganciclovir for herpetic and CMV respectively along with systemic steroids

**Table 1:** Baseline characteristics

Age in years (Mean $\pm$ SD)	35.07 $\pm$ 14.54
Gender, N (%)	
Male	12 (52.17)
Female	11 (47.83)
HIV positive, N (%)	14 (60.87)
Type of Infection, N (%)	
Toxoplasmosis	10 (43.48)
Cytomegalovirus	11 (47.83)
Herpetic	1 (4.35)
Chikungunya	1 (4.35)
Mean baseline visual acuity in logMAR (Snellen)	0.86 (6/45)
Foveal thickness in $\mu\text{m}$ (Mean $\pm$ SD)	300.41 $\pm$ 276.89
Subfoveal choroidal thickness in $\mu\text{m}$ (Mean $\pm$ SD)	288.50 $\pm$ 120.15



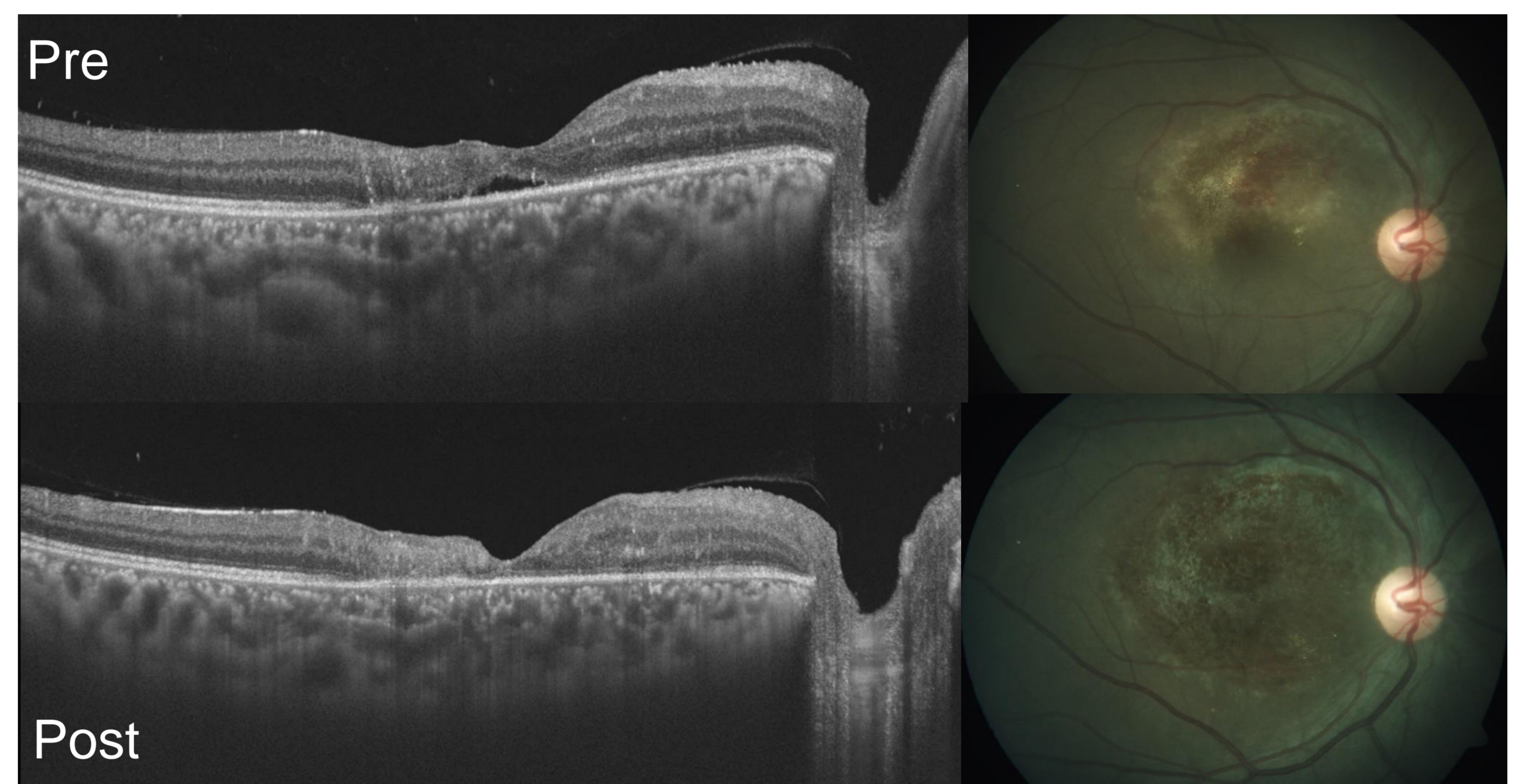
**Figure 1B:** Pre and post treatment fundus image and SS-OCT of a patient with ocular toxoplasmosis, showing reduction in extent of inflammatory activity following treatment. The FT significantly decreased from 572 microns to 238 microns and SFCT significantly decreased from 719 microns to 249 microns.

## Comments:

- Inflammation of choroid (SFCT) in patients with ocular toxoplasmosis measured using SS-OCT is significantly higher when compared to viral lesions whereas no significant difference was noted in retinal thickness.
- HIV negative patients showed better visual and structural outcome compared to HIV positive patients in our study.

## Conclusions:

SS-OCT is a useful tool in demonstrating retinal and choroidal changes over SD-OCT in retinitis and retinochoroiditis as SFCT plays an important role in differentiating disease etiology over FT.



**Figure 1A:** Pre and post treatment fundus image and SS-OCT of a patient with herpetic retinitis, showing complete elimination of sub-retinal fluid following treatment. The FT decreased from 150  $\mu\text{m}$  to 70  $\mu\text{m}$ , whereas SFCT remained stable being 362  $\mu\text{m}$  in pre and 370  $\mu\text{m}$  in post

## Results:

- Thirty-three eyes of 23 patients were included for pre treatment analysis.
- Baseline foveal thickness (FT) and subfoveal choroidal thickness (SFCT) were compared between the viral and toxoplasmosis groups.
- Independent t-test analysis (Mann-Whitney) revealed statistically significant difference in SFCT between these groups ( $p=0.02$ ).
- Mean SFCT of ocular toxoplasmosis group was 319.44  $\mu\text{m}$  and that of viral group was 259.47  $\mu\text{m}$ .
- Mean FT of toxoplasmosis group was 235.45  $\mu\text{m}$  and viral group was 334.43  $\mu\text{m}$ . No statistically significant difference was noted for FT.

## Treatment outcome:

- Significant association ( $p=0.008$ ) was noted between presence of HIV and clinical outcome.
- Improvement in vision was significantly better in HIV negative patients when compared with HIV positive patients.
- Mean logMAR difference before and after treatment in HIV positive group was -0.12 (worsened after treatment), whereas HIV negative group was 0.26 (improvement).
- Thirteen eyes underwent SS-OCT at follow-up visit and showed clinically significant difference in improvement of FT and SFCT irrespective of HIV status and infection etiology.