

Correlation of “Panoramic” Optical Coherence Tomography Angiography With Indocyanine Green Angiography Characteristics of Serpiginous-Like Choroiditis

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BACKGROUND AND OBJECTIVES: To analyze the panoramic optical coherence tomography angiography (P-OCTA) characteristics of serpiginous-like choroiditis (SLC) and to correlate these findings with indocyanine green angiography (ICGA).

PATIENTS AND METHODS: Prospective, observational study of 32 eyes of 24 patients. Twenty-seven eyes of 16 patients who met inclusion criteria were included in the final study. Multimodal imaging was performed using P-OCTA, OCT, fundus autofluorescence, fluorescein angiography, and ICGA. Morphologic features at the site of lesions were analyzed using P-OCTA and correlated with ICGA.

RESULTS: P-OCTA in active phase revealed areas of large flow void, which correlated with hypofluorescent areas on ICGA. Healing phase revealed appearance of vascular network due unmasking of choriocapillaris that corresponded to reduced hypofluorescence on ICGA.

CONCLUSION: P-OCTA as a noninvasive tool provides widefield and high-resolution images that can be used as an complementary tool to ICGA for diagnosis of SLC cases.

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INTRODUCTION

Choroiditis is a form of posterior uveitis with primary inflammation of the retinal pigment epithelium (RPE) and choriocapillaris and secondary involvement of the retina leading to chorioretinal scar formation.^{1,2,3} It has a wide spectrum of presentation with several variants reported in literature.⁴ Lying at the ends of spectrum are two distinct uveitic entities: serpiginous choroiditis (SC) and serpiginous-like choroiditis (SLC).^{5,6}

Since 2003, SLC, has been described as a form of choroiditis with predominant underlying etiology being tuberculosis. It is usually unilateral, since the inflammation is usually active in one eye at a time and is characterized by multifocal, irregular lesions involving the midperiphery, periphery, and at times the macular region, as well.^{5,6,7}

Various multimodal imaging tools are employed to investigate clinical features and plan management. Indocyanine green angiography (ICGA) is considered as test of choice for assessing choroiditis lesions but, being an invasive procedure, it carries certain risks.^{7,8}

Optical coherence tomography angiography (OCTA) is a noninvasive tool that works on the principle of “decorrelation” and results in the formation of en face images of retinal capillary network and choroidal vasculature without requiring dye. AngioScan OCT Angiography software on the RS-3000 Advance OCT (Nidek, Gamagori, Japan) provides “panoramic images” with larger fields of view (Figure 1). Panoramic OCTA (P-OCTA) images allow three-dimensional analysis, are repeatable on follow-up examinations,

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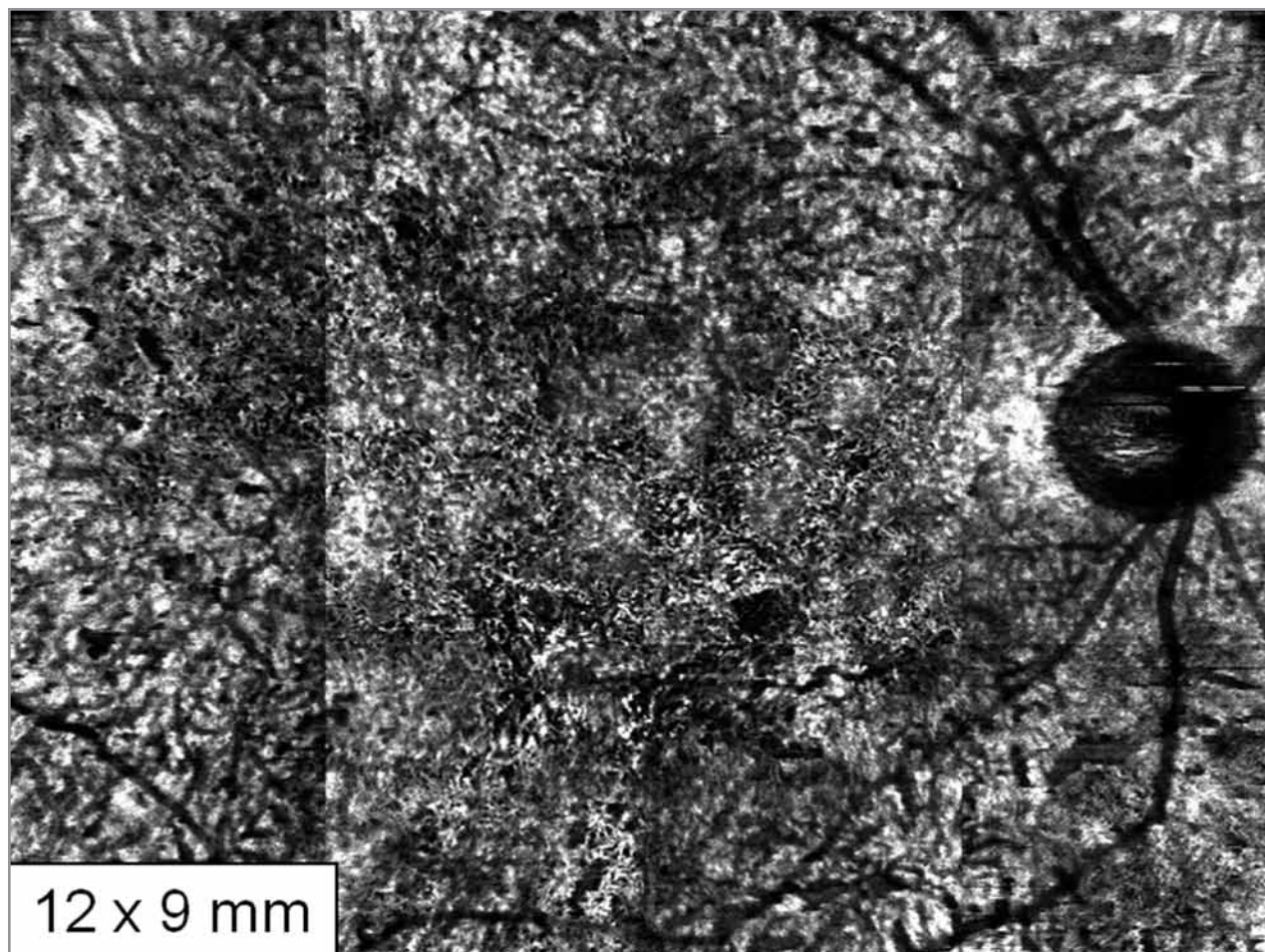


Figure 1. Optical coherence tomography angiography (AngioScan OCT Angiography software on the RS-3000 Advance OCT; Nidek, Gamagori, Japan) of a normal subject at the retinal pigment epithelium-Bruch's membrane level provides panoramic images of the choriocapillaris and choroidal vasculature with large field of view 12 mm × 9 mm (40° × 30°).

and, to a certain extent, are comparable to fluorescein angiography (FA) and ICGA in terms of resolution.⁸ This study aims to analyze the noninvasive P-OCTA imaging characteristics of SLC and to correlate these findings with ICGA features.

PATIENTS AND METHODS

Study Design and Patient Enrolment

This is a single-center, prospective, observational study approved by the institutional review board. All cases provided informed consent to be enrolled in the study and data were collected from patients diagnosed as SLC at retina clinic from October 2016 to June 2017.

Eligibility Criteria and Data Collection

Inclusion criteria were: clinical findings consistent with active stage of SLC pre-treatment at presentation and with healing stage of SLC post-treatment during

follow-up on ICGA, follow-up of at least 6 months with regular medications, and complete availability of documentation until the last follow-up. If any one of the above-mentioned inclusion criteria was not met, patients were excluded from the study.

Investigations

Diagnosis of tuberculosis (TB) was made by clinical or relevant laboratory tests, and cases were classified as confirmed, probable, or possible as per the criteria given below: i) Confirmed intraocular TB: microbiological confirmation of tuberculosis from ocular fluids / tissues. ii) Probable intraocular TB: Chest X-ray consistent with TB infection or clinical evidence of extraocular TB or microbiological confirmation from sputum or extraocular sites along with immunological evidence of TB. iii) Possible intraocular TB: positive immunological tests for TB (tuberculin skin test: posi-

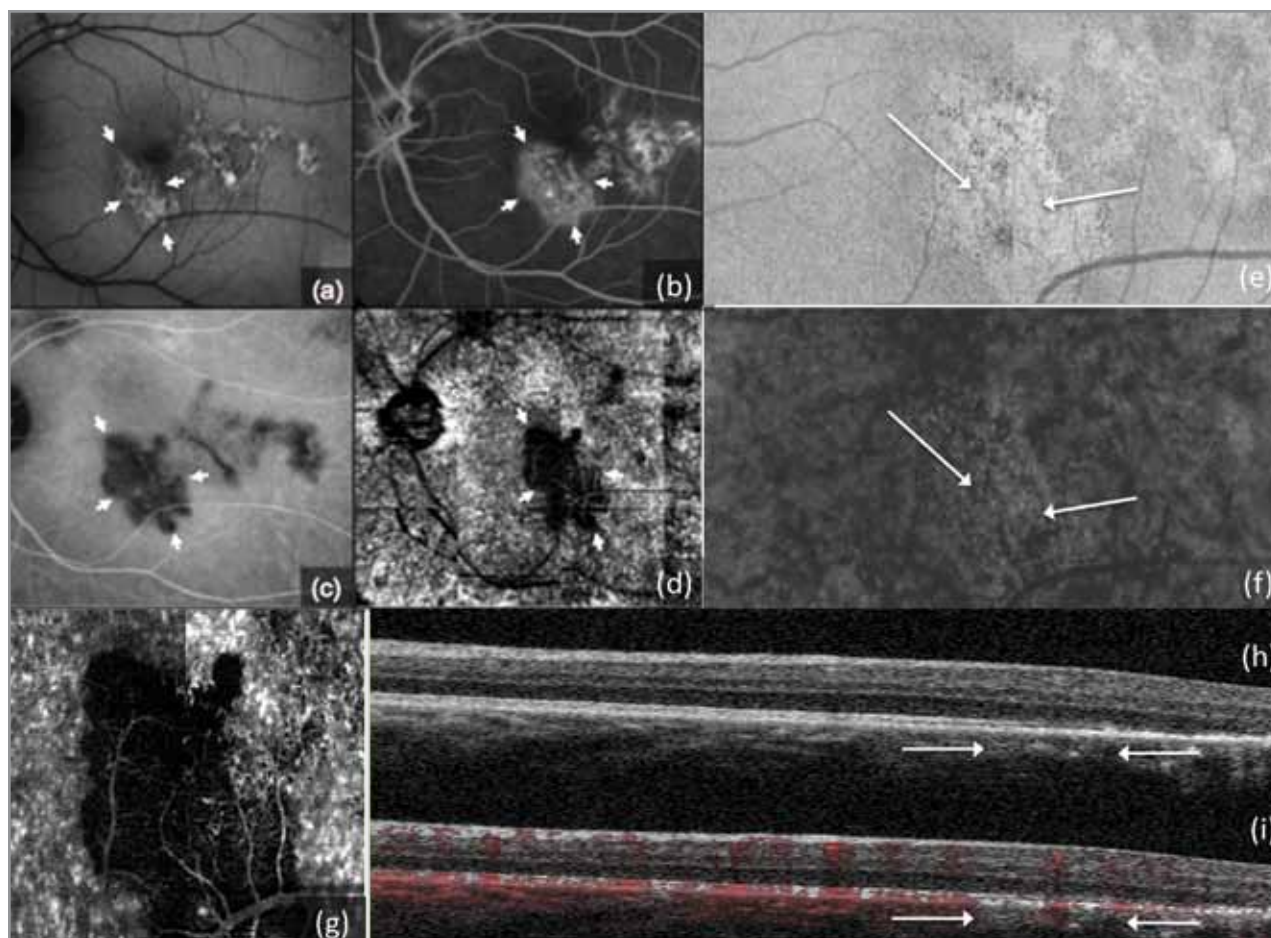


Figure 2. Multimodal imaging of active serpiginous-like choroiditis lesions in a 35-year-old female. (a) Fundus autofluorescence image (Stage 1) showing ill-defined hyperautofluorescence throughout the lesion, indicated by white arrows. (b) Fluorescein angiography image showing hyperfluorescence of the lesion in late frames. (c) Corresponding indocyanine green angiography showing areas of hypofluorescence in the late frames. (d) Panoramic optical coherence tomography angiography (OCTA) en face image of the choriocapillaris layer showing the large flow void areas with faintly visible medium- and large-sized choriocapillaris. (e, f) Structural en face OCTA at the level of avascular zone and retinal pigment epithelium-Bruch's membrane, respectively, showing that the corresponding area has a decrease in OCT signal transmission, indicating that either there is flow void, possibly because of loss of blood flow, or a reduced transmission of OCT signals. (g) OCTA 3 mm × 3 mm cube through the lesion, indicating the area of cross-section OCT B-scan taken. (h) Cross-sectional OCTA B-scan passing through the area of lesion as indicated in (g) shows that there is reduction of OCT signals, possibly due to shadowing and leading to decrease in the signal transmission, or due to true loss of blood flow within choriocapillaris. (i) Cross-sectional OCTA B-scan with blood flow overlay passing through the area of lesion as indicated in (g) shows that there is reduction of blood flow in the area of decreased OCT signals.

tive induration of 10 mm × 10 mm after 48 to 72 hours or positive interferon gamma release assay test: positive QuantiFERON of 0.35 IU/mL or positive T-SPOT.TB) or chest X-ray consistent with TB infection.

Treatment Regimen

Patients were treated with a tapering course of oral corticosteroids (1 mg/kg/day to 1.5 mg/kg/day) and patients diagnosed with tuberculosis were treated with anti-tubercular therapy.⁹ Patients di-

agnosed with tuberculosis were treated with isoniazid 300 mg, rifampicin (Rifadin; Sanofi-Aventis, Wilmington, DE) 450 mg, and pyrazinamide 1,200 mg/day initially for 2 to 3 months. Thereafter, rifampicin and isoniazid were used for at least another 9 to 12 months.⁹ In few cases with macular-involving/threatening lesions, patients also received intravenous methylprednisolone (1,000 mg in 150 mL of normal saline given as slow infusion over 30 to 45 minutes under physician's supervision) for a period of 3 days.

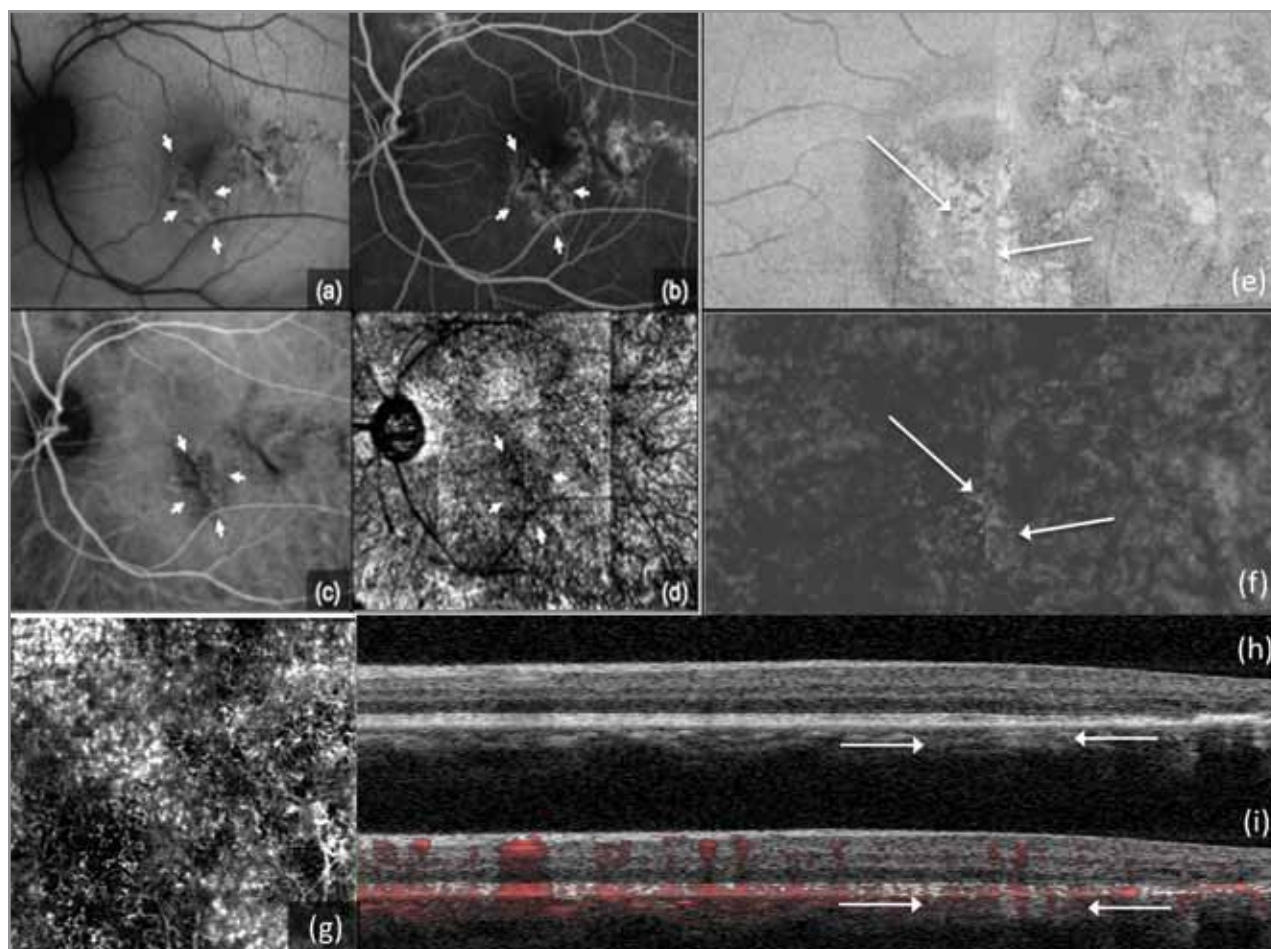


Figure 3. Multimodal imaging of healed serpinginous-like choroiditis lesions in the same 35-year-old female 6 months post-treatment. (a) Fundus autofluorescence image (Stage 4) showing uniform hypoautofluorescence within the lesion indicated by white arrows. (b) Fluorescein angiography image showing less intense hyperfluorescence of the lesion as compared to active lesion of Figure 2 in late frames. (c) Corresponding indocyanine green angiography (ICGA) showing lesions as less hypofluorescent, well-demarcated, and delineated as compared to active lesions on ICGA in Figure 2. (d) Panoramic optical coherence tomography angiography (OCTA) en face image of the choriocapillaris layer showing a marked decrease / reduction in large flow void areas and unmasking of middle and large choriocapillaris architecture. (e, f) Structural en face OCTA at the level of avascular zone and retinal pigment epithelium-Bruch's membrane respectively showing that the corresponding area has now increase in OCT signal transmission (compared to figure 2). (g) OCTA 3 mm × 3 mm cube through the lesion indicating the area of cross-section OCT B-scan taken. (h) Cross-sectional OCTA B-scan passing through the area of lesion as indicated in (g) shows that there is improved transmission of OCT signals (compared to figure 2). (i) Cross-sectional OCTA B-scan with blood flow overlay passing through the area of lesion as indicated in (g).

Study Parameters

All cases underwent a complete eye examination at presentation and also at every follow-up visit. The examination protocol included dilated fundoscopic examination (showing geographic patches of gray or creamy yellow placoid lesions in the peripapillary region, with finger-like or serpentine projections), color fundus images (TRC-50DX; Topcon Medical Systems, Oakland, NJ), fundus autofluorescence (FAF), fundus fluorescein angiography (FFA), ICGA (Spectralis; Heidelberg Engineering, Heidelberg, Germany), and

spectral-domain OCT (SD-OCT) (Spectralis). P-OCTA (RS-3000 Advance OCT) was performed in all eyes centered on the fovea covering 12 mm × 9 mm area (40° × 30° field of view). AngioScan RS-3000 Advance software was used to segment the outer retinal layers and choriocapillaris.

Image Analysis

For all cases, images acquired at presentation and subsequent follow-up examination were examined by two independent masked examiners.

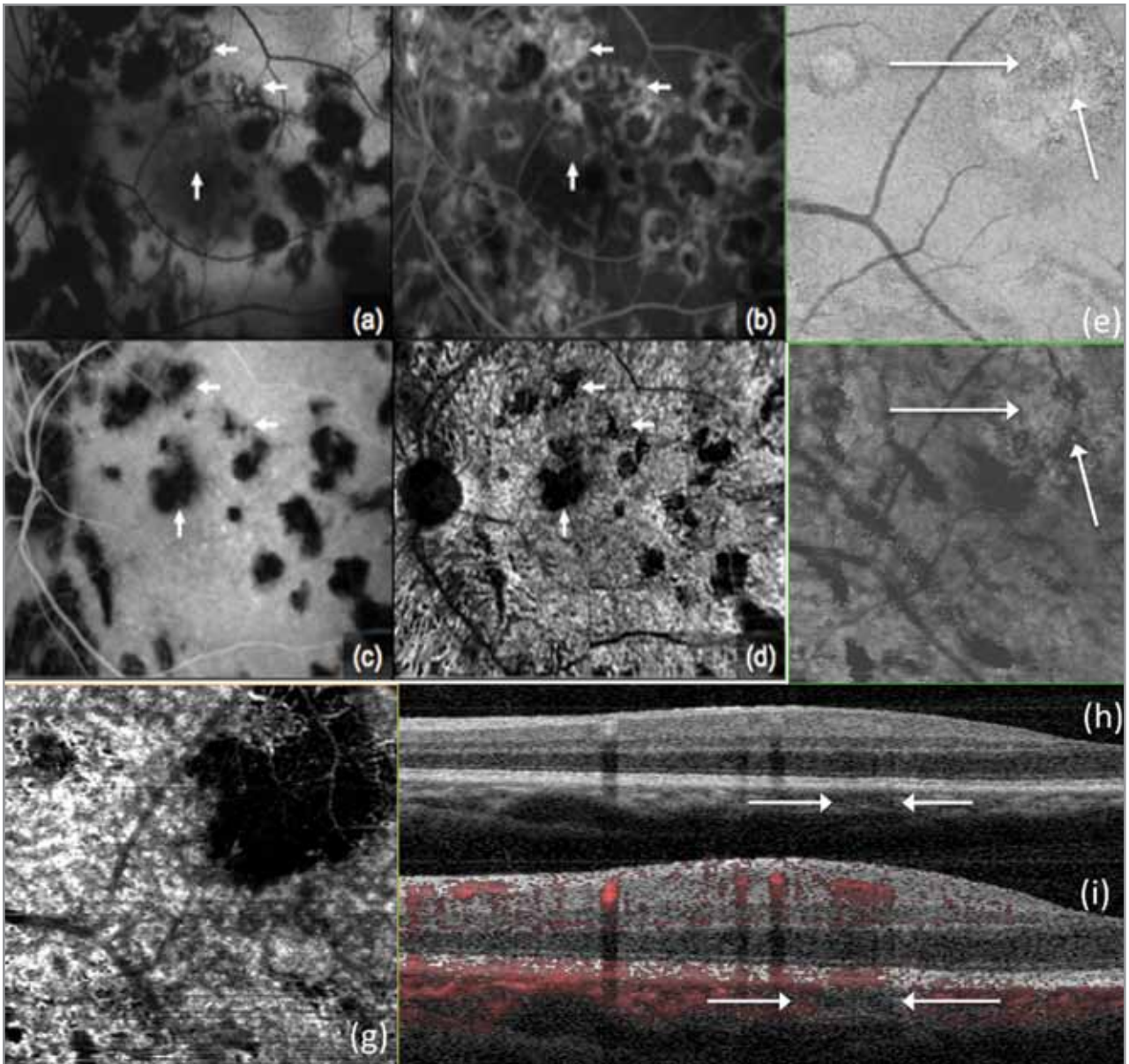


Figure 4. Multimodal imaging of active serpiginous-like choroiditis lesions in a 39-year-old male. (a) Fundus autofluorescence image (Stage 2) showing lesions as ill-defined hyperautofluorescence throughout the lesion surrounded by thin rim of hypoautofluorescence indicated by white arrows. (b) Fluorescein angiography image showing hyperfluorescence of the lesion. (c) Corresponding indocyanine green angiography showing areas of hypofluorescence in the late frames. (d) Panoramic optical coherence tomography angiography (OCTA) en face image of the choriocapillaris layer showing the large flow void areas or areas of decreased decorrelation signal. (e, f) Structural en face OCTA showing that the corresponding area has decrease in OCT signal transmission indicating that either there is flow void may be because of loss of blood flow or a possibly reduced transmission of OCT signals. (g) OCTA 3 mm × 3 mm cube through the lesion indicating the area of cross-section OCT B-scan taken. (h) Cross-sectional OCTA B-scan passing through the area of lesion as indicated in (g) shows that there is reduction of OCT signals, possibly due to shadowing and leading to decrease in the signal transmission or due to true loss of blood flow within choriocapillaris. (i) Cross-sectional OCTA B-scan with blood flow overlay passing through the area of lesion as indicated in (g).

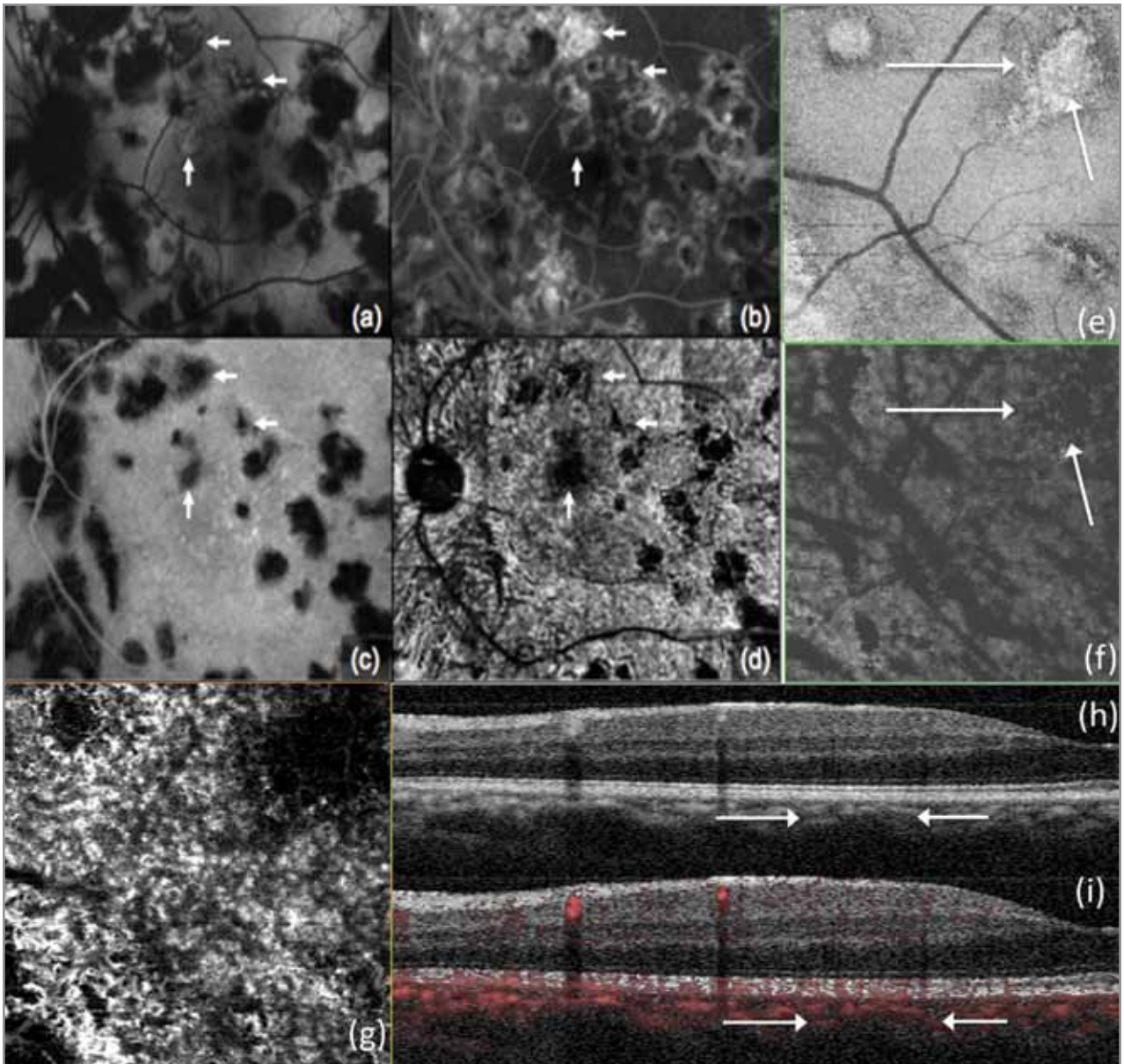


Figure 5. Multimodal imaging of healing serpiginous-like choroiditis lesions in the same 39-year-old male 6 months post treatment. (a) Fundus autofluorescence image (Stage 3) showing predominantly hypoautofluorescent lesion with stippled pattern indicated by white arrows. (b) Fluorescein angiography image showing less intense hyperfluorescence of the lesion as compared to active lesion of Figure 2. (c) ICGA showing lesions as less hypofluorescent, well demarcated and delineated as compared to active lesions on indocyanine green angiography in Figure 2. (d) Panoramic optical coherence tomography angiography (OCTA) en face image shows a marked decrease / reduction in large flow void areas and unmasking of middle and large choriocapillaris architecture. (e, f) Structural en face OCTA at the level of avascular zone and retinal pigment epithelium-Bruch's membrane, respectively, showing that the corresponding area has now increase in OCT signal transmission (compared to Figure 2). (g) OCTA 3 mm × 3 mm cube through the lesion indicating the area of cross-section OCT B-scan taken. (h) Cross-sectional OCTA B-scan passing through the area of lesion as indicated in (g) shows that there is improved transmission of OCT signals (compared to figure 2). (i) Cross-sectional OCTA B-scan with blood flow overlay passing through the area of lesion as indicated in (g) shows that there is improvement of blood flow in the area of lesion.

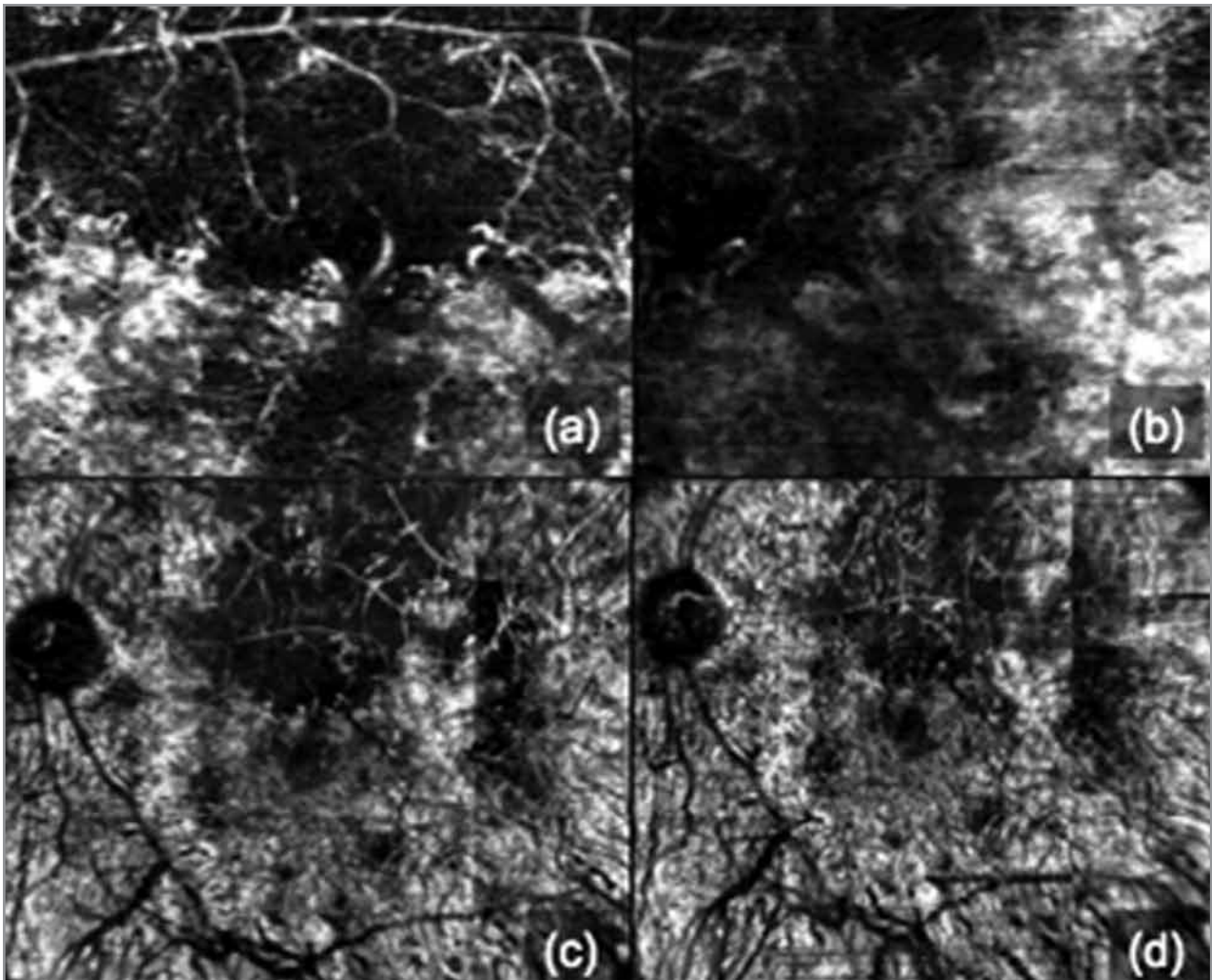


Figure 6. (a) En face optical coherence tomography angiography (OCTA) image encompassing 3 mm × 3 mm area (10° × 10° field of view) showing a large area of flow void with few unmasked medium and large sized choriocapillaris. (b) En face OCTA image encompassing 3 mm × 3 mm area (10° × 10° field of view) of same subject in healing phase at the level of retinal pigment epithelium-Bruch's membrane showing a decreased area of large area of flow void with unmasked medium and large sized choriocapillaris. (c) Panoramic OCTA en face image of the choriocapillaris layer encompassing 12 mm × 9 mm area (40° × 30°) with similar resolution as of 3 mm × 3 mm cube (corresponding to image a) showing the large flow void areas or areas of decreased decorrelation signal with few unmasked medium and large sized choriocapillaris. (d) Panoramic OCTA en face image of the choriocapillaris layer encompassing 12 mm × 9 mm area (40° × 30°) with similar resolution as of 3 mm × 3 mm cube (corresponding to image b) showing a marked decrease / reduction in large flow void areas or areas of decreased de-correlation signal and unmasking of middle and large choriocapillaris architecture due to reperfusion of choriocapillaris.

Statistical Analysis

Descriptive analysis was used to compare the appearance of the panoramic OCTA imaging with ICGA, EDI-OCT, and FAF.

RESULTS

Thirty-five eyes of 24 patients were studied. Out of these, only 27 eyes of 16 patients with SLC who met our inclusion criteria were included in the study. The mean age at presentation was 35.8 years ± 11.6

years (range: 13 years to 62 years). The gender distribution comprised 17 eyes of 10 males. The average duration of follow-up was 6 months (from the start of treatment). All eyes included had lesions in posterior pole. The demographic details of patients are listed in Table 1.

P-OCTA Features

At presentation, all eyes with active lesions on P-OCTA (stage 1 and 2 on FAF) demonstrated areas

TABLE 1
Demographic Features of Patients With SLC Included in Study

| Subject No. | Sex | Age (In Years) | Laterality | Eye | Type of SLC | BCVA |
|-------------|-----|----------------|------------|-----|-------------|--------|
| 1 | M | 23 | UL | OD | Multifocal | 20/30 |
| 2 | M | 28 | BL | OU | Placoid | 20/80 |
| 3 | M | 34 | BL | OU | Multifocal | 20/120 |
| 4 | F | 32 | BL | OU | Multifocal | 20/200 |
| 5 | F | 20 | BL | OU | Multifocal | 20/80 |
| 6 | M | 38 | UL | OD | Placoid | 20/200 |
| 7 | M | 21 | UL | OS | Placoid | 20/120 |
| 8 | F | 50 | UL | OD | Multifocal | 20/30 |
| 9 | M | 39 | BL | OU | Multifocal | 20/80 |
| 10 | F | 28 | UL | OS | Multifocal | 20/40 |
| 11 | M | 60 | BL | OU | Multifocal | 20/80 |
| 12 | M | 24 | BL | OU | Multifocal | 20/40 |
| 13 | F | 35 | BL | OU | Placoid | 20/120 |
| 14 | M | 15 | BL | OU | Placoid | 20/200 |
| 15 | F | 55 | BL | OU | Multifocal | 20/30 |
| 16 | M | 30 | BL | OU | Multifocal | 20/80 |

SLC = serpiginous-like choroiditis; BCVA = best-corrected visual acuity; M = male; F = female; UL = unilateral; BL = bilateral; OD = right eye; OS = left eye; OU = both eyes

of large flow void or dark areas with decreased decorrelation signal. These areas were noncontiguous and multifocal in distribution. However, these features on P-OCTA could be attributed to either choriocapillaris hypoperfusion or decreased transmission of signals (Figures 2 and 4).

At subsequent follow-up visits post-treatment, in all eyes, the lesions in various stages of healing (stage 3 and 4 on FAF) were studied. These eyes demonstrated areas of reduced large flow void or appearance of increased decorrelation signals with unmasking of choriocapillaris within the flow void areas. Corresponding to active phase, in healing phase, the areas of reduced flow void were again noncontiguous and multifocal in distribution (Figures 3 and 5).

Comparisons Between P-OCTA, ICGA, and FA

FA in all eyes with active phase demonstrated abnormal sites in early frames as multiple, ill-defined, scattered areas of hypofluorescence (secondary to atrophy of choriocapillaris), with progressive hyperfluorescence at the margins of the lesion (eventual diffuse late staining of the underlying sclera) in late frames. In all eyes with healing phase, FA revealed similar features as of active stag; however, the lesions in early frames were less hypofluorescent and

in late frames, hyperfluorescence at the margins was less intense. The lesions were now better demarcated with well-defined edges and borders.

ICGA during active phase in all eyes revealed pathological sites as multiple, poorly defined areas of hypofluorescence in the early and late frames (representing choriocapillaris nonperfusion and corresponding to a primary inflammatory choriocapillaropathy) and as demonstrated in clinical fundus picture, the lesions were noncontiguous and multifocal in distribution. Post-treatment, the lesions became less hypofluorescent (possibly due to choriocapillaris reperfusion), well-demarcated and delineated, as the disease progressed from active to healing phase.

The active lesions seen in all eyes on ICGA exactly correlated with P-OCTA, in terms of their location and distribution. The large flow void areas or areas of decreased decorrelation signal corresponded with area of hypofluorescence on ICGA. In all eyes with lesions during various stages of healing, there was unmasking of middle and large choriocapillaris architecture possibly due to reperfusion of choriocapillaris. This feature was seen only on P-OCTA, which was not demonstrated on ICGA (Table 2).

TABLE 2
Correlation and Comparison of Panoramic OCTA and ICGA Features With FAF Staging in SLC⁵

| *Stage (Of FAF) | FAF Features | ICGA Features | P-OCTA Features |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Active (Stage 1 of FAF) | Ill-defined hyperautofluorescence throughout the lesion | Early and late hypofluorescence, fuzzy margins | Choriocapillaris flow void (large flow void areas)/ possible signal attenuation; no medium/large choroidal vessels seen. Lesions were much delineated. |
| Healing (Stage 2 & 3 of FAF) | Thin rim of hypoautofluorescence surrounding the lesion with predominantly hypoautofluorescent lesion with stippled pattern | Early hypofluorescence with discrete margins, faint late central reduced hypofluorescence | Decreased irregular areas of choriocapillaris flow void (decreased large flow void areas)/ possible signal attenuation; no medium/large choroidal vessels seen. Lesions were better delineated and demarcated. |
| Healed (Stage 4 of FAF) | Uniform hypoautofluorescence within the lesion. | Early and late hypofluorescence; hyperfluorescent large deep choroidal vessels with discrete margins | Presence of vascular tufts/tangled vessels in inner choroid due to further unmasking of middle and large choriocapillaris architecture. Lesions were better delineated and demarcated. |

**Staging of choroiditis lesions was based on fundus auto-fluorescence imaging.*

SLC = serpiginous-like choroiditis; FAF = fundus autofluorescence; OCTA = optical coherence tomography angiography; ICGA = indocyanine green angiography

Comparisons Between P-OCTA and FAF Imaging

The characteristic features of lesions during both active and healing phases on P-OCTA and FAF are compared, correlated, and described in Table 2 (Figures 4 and 5).

Comparisons Between P-OCTA and Routine 3 mm × 3 mm OCTA

P-OCTA scores over a routine 3 mm × 3 mm cube of OCTA in terms of field of view and scan acquisition time. P-OCTA offers a maximum field of view of 40° × 30° (12 mm × 9 mm) as compared to a routine 3 mm × 3 mm scan, which offers 10° × 10° field of view only. In terms of scan acquisition time, 3 mm × 3 mm routine OCTA scan takes less time (30 seconds to 1 minute) as compared to P-OCTA scan (10 to 15 minutes). The resolution of both 3 mm × 3 mm and P-OCTA is 11.7 μm. Since P-OCTA is prepared by taking multiple 3 mm × 3 mm cubes at different locations and then integrated immediately by the software, the resolution remains exactly the same (Figure 6).

DISCUSSION

The basic underlying pathogenic mechanism in patients of SLC proposed in literature is either ischemia of choriocapillaris (a persistent decrease in choriocapillaris vascularity) or inflammatory choriocapillaropathy (destruction of the choriocapillaris associated with choroidal inflammation). This causes disruption of the RPE and photoreceptors, which are fed by the choriocapillaris, resulting in permanent visual loss.^{5,10} However, enough data are yet not available to explain the alterations or the changes occurring during active, healing, and healed stages of SLC.

ICGA is considered as the gold standard test for SLC that can provide information related to state of choriocapillaris. It provides true extent of the condition by identifying and reporting all the lesions. Despite of ICGA's unique ability to provide information about choriocapillaris, it carries certain major disadvantages. First, it fails to explain the microstructural details of affected choriocapillaris. Second, being an invasive procedure, it car-

ries significant inherent risks due to dye injection and is contraindicated in pregnancy and patients with raised creatinine levels, and it is also not preferred in children. Third, being expensive and time-consuming, it may not be logistically feasible to perform ICGA during each and every follow-up visit.^{1,5,11}

In our study, the classical finding obtained in all eyes with active lesions of SLC on OCTA was the presence of possible large flow void or decreased decorrelation signals at the level of choriocapillaris. In their study on SLC cases, Mandadi et al. also reported similar findings of OCTA during active stage, proposing that this might be due to decreased signal transmission rather than true loss of blood flow.⁵

However, availability of corresponding B-scans along with OCTA images (Figures 2-5) to certain extent show this is not an artifact in the form of reduced signal transmission, but rather there appears to be a true loss of blood flow.

While comparing features seen on OCTA during active stage of disease with ICGA features during same stage, the hypofluorescent lesions on ICGA correlated exactly with large flow void or decreased decorrelation signals in terms of location, size, and distribution. However, the lesions are better demarcated and delineated in OCTA compared to ICGA.

Similarly, during the various healing stages of disease seen in all eyes in our study, the OCTA demonstrated areas of reduced large flow void or appearance of increased decorrelation signals, with unmasking of choriocapillaris within the flow void areas. The presence of this feature strongly suggests that the areas of large flow void or dark areas with decreased decorrelation signal on P-OCTA during active phase represent choriocapillaris hypoperfusion. Mandadi et al. have proposed that these larger vessels may represent either compensatory response to the atrophy or could be vessels from the Sattler layer that have been pushed toward the RPE–Bruch complex because of choriocapillaris atrophy.⁵ While comparing features seen on OCTA during healing stage of disease with ICGA features during same stage, the reduced hypofluorescent lesions on ICGA correlated exactly with reduced large flow void areas in terms of location, size, and distribution.

Montorio et al. analyzed choroidal vascular density of affected and nonaffected areas in active and inactive SC by means of swept-source OCTA (SS-OCTA). They included 22 eyes of 11 patients diagnosed with SC. Their results state that all inactive inflammatory lesions in their study were characterized by atrophy of choriocapillaris with an impairment of its detectable flow and greater visibility of choroidal ves-

sels. On the other hand, all active inflammatory lesions showed an area of complete absence of decorrelation signal.¹² These results interpreted by Montorio et al. and Mandadi et al. support our findings that the flow void areas during the active phase of disease occur due to choriocapillaris hypoperfusion.

In OCTA during the active stages, the choriocapillaris are faintly visible, probably due to ischemia and hypoperfusion, but in healing stages due to reperfusion, these choriocapillaris became unmasked and more obvious due to reduction of choroidal ischemia and / or reperfusion of choriocapillaris post-treatment. Hence, it can be mentioned that OCTA noninvasively not only correlates with the ICGA findings, but also provides supplement information on morphology of choroidal vasculature in various stages of disease and thus helps to better understand the underlying pathology.

OCTA although is a revolutionary imaging modality; however, it carries major limitations that need due attention. It is a nascent technology, which still needs lot of understanding, common vocabulary among interpreters, and some technical refinement.^{13,14} Owing to the presence of projection artifacts of superficial layers onto the deeper layers, the lesions at the level of choroid and choriocapillaris needs to be studied and evaluated carefully. Also, the SD-OCTA has less penetration in acute inflammation of choroid, which an examiner can overcome with introduction of SS-OCTA, but it is yet to be commercially available.^{5,8}

The most important disadvantage as reported by previous studies who made an attempt to study the morphological features of SLC during various active and healing stages with OCTA was the small field of view.⁵ The field of study obtained in a 3 × 3 cube of OCTA is not comparable to field offered by FA and ICGA. If the interpreter increases the field size, it reduces the resolution of images significantly, hampering interpretation and correlation to a major extent. The “panorama” feature, included for the first time in our study, overcomes this significant disadvantage. Thus, it allows the examiner to correlate the invasive ICGA findings with noninvasive OCTA findings in the best possible way.⁸

With the advent of the panoramic imaging feature, it was possible to obtain large field of view (12 mm × 9 mm; 40° × 30°) equivalent to field of view provided by ICGA and FA in a particular image centered at fovea and enabled us to cover majority of the lesions.

FAF also contributes to a certain extent in diagnosing the stage of SLC based on presence of certain characteristic features. These findings of choroiditis on FAF present a diverse spectrum and on this basis several authors in few published reports have divided

choroiditis into three to four stages, depending upon the activity and its correlation with FAF findings.^{15,16} The information decoded by FAF concerns RPE, whereas OCTA provides information about retinal and choroidal vasculature. Future improved technologies in ocular imaging will better help in analyzing and correlating the FAF and OCTA features.^{5,15,16,17,18}

Our study has a few limitations, including: a majority of the patients in the study were in the group of “possible intraocular TB;” a small number of cohorts; a lack of further long-term follow-up beyond 6 months; the presence of projection artifacts of overlying superficial retinal vessels over choriocapillaris in images and nonavailability of swept-source OCTA that can further provide more insight in context to morphological changes of choriocapillaris.

To conclude, this study describes and establishes correlation among features provided by multimodal imaging techniques during active and healing stages of SLC. Future longitudinal studies with the ongoing development in the field of biomedical engineering using panorama feature and preferably swept-source technology will definitely go a long way in analyzing and further understanding the pathologic alterations seen on OCTA. Nonetheless, P-OCTA is certainly a promising imaging modality that can be used as a complementary diagnostic test.

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