Non-Ischemic Central Retinal Vein Occlusion (CRVO) and its Management using Ayurvedic Therapies: A Case Series

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ABSTRACT

Introduction: Central retinal vein occlusion (CRVO) may result in either blurring of vision in the non-ischemic variety or vision loss in the ischemic variety. The two varieties of CRVO are identifiable by distinctive fundus findings. Observation is the first line of management in non-ischemic CRVO, but this does not always produce desired results. Hence, options in complementary and alternative medicine, including Ayurveda, may be sought.

Case Series: Data about three patients of non-ischemic CRVO who underwent conventional management but got marginal relief of their symptoms are presented here. The patients were managed using specially-tailored Ayurvedic treatments such as oral medicines, purification procedures, and local therapies for both the eyes and head.

Results: Satisfactory results in visual acuity, posterior segment examination, and optical coherence tomography (OCT) were noted.

Conclusion: The main aim and challenge in management were to improve visual acuity while bringing back normal findings and maintaining the integrity of the retina by both fundus examination and OCT. The results obtained in this series indicate the potential of Ayurvedic treatments to manage non-ischemic CRVO.

Key Words: Case report, Kriyakalpa, Panchakarma Therapy, Timira

INTRODUCTION

CRVO, a major cause of vision impairment and blindness,¹ has a prevalence of 0.1-0.7 per cent in population-based studies.² Its division into ischemic and non-ischemic varieties, though arbitrary, is important as up to 2/3 of patients with the ischemic variety develop rubecious iridis and neovascular glaucoma.³ In some cases, CRVO may be idiopathic. Diabetes mellitus as a cause for CRVO may be attributed to its association with cardiovascular risk factors such as hypertension; its inadequate control may predispose to CRVO either in the same or fellow eye.⁴

Ischemic and non-ischemic CRVO are differentiated based on cardinal signs and symptoms. Although the prognosis of non-ischemic CRVO is good, its chances for progression into ischemic CRVO is 15% within 4 months and 34% within 3 years.⁵ As convincing evidence of conventional management that alters the natural course of CRVO does not exist,⁶ alternative options in the realms of complementary and alternative medicine (CAM), including Ayurveda, may be sought.⁷

Methodology

A systematic review of data about three patients of non-ischemic CRVO, along with their specially-tailored Ayurvedic treatments, is described in this case series. Informed written consent was obtained from the patients for detailing their cases. The series was prepared as per the Case Report (CARE) guidelines to ensure transparency and efficiency in reporting.⁸
**Case 1**
A 52-year-old non-diabetic and non-hypertensive female presented with a 7-month history of gradual blurring of vision associated with floaters in her right eye (OD). She consulted an ophthalmologist, who advised injection of anti-VEGF, which she denied. She was put under observation, but no results were obtained. She consulted Sreedhareeyam, where she was diagnosed with non-ischemic CRVO. Her immediate family members do not present with similar complaints. Personal history, review of systems, and vital signs were within normal limits.

Unaided distant visual acuity (DVA) was LogMAR 1 OD and LogMAR 0 OS (left eye) and near visual acuity (NVA) was N6 OU. Anterior segment examination in both eyes (OU) was within normal limits. Direct and consensual pupillary reflexes were sluggish OD and normal OS. Posterior segment examination OD was remarkable for tortuous blood vessels, cotton-wool spots, and a few haemorrhages in the superior and inferior quadrants (Figure 1a), while fundus examination OS showed normal findings. Optical coherence tomography (OCT) scanning OD demonstrated cystoid macular oedema (Figure 1b), while normal findings were demonstrated OS. Routine haematology, fasting blood glucose, and lipid profile showed normal findings. She was admitted for an eight-day course of inpatient treatment.

Both DVA and NVA were maintained at discharge. Fundus examination OD showed resolution of tortuous blood vessels, cotton-wool spots, and haemorrhages (Figure 1c), and OCT scanning showed resolution in the cystic lesions (Figure 1d). DVA improved to LogMAR 0.77 OD at one follow-up and was maintained at another follow-up. DVA of LogMAR 0.6 with pinhole acuity improving to LogMAR 0.5 was noted at a third follow-up.

**Case 2**
A 31-year-old non-diabetic and non-hypertensive female presented with a 1-month history of sudden blurring of vision OS. She consulted an ophthalmologist upon the initial starting of the symptom and was advised anti-VEGF injection. She took one course but got marginal relief. In October 2014 she consulted Sreedhareeyam. Her immediate family members do not present with similar complaints. Personal history, review of systems, and vital signs were within normal limits.

Unaided DVA was LogMAR 1 OD, aided DVA was LogMAR 0 OU, and NVA was N18 OD and N12 OS. Anterior segment examination OU was within normal limits. Pupillary examination OU showed normal responses to both direct and consensual reflexes. Posterior segment examination OD showed normal findings, while tortuous blood vessels, cotton-wool spots, and haemorrhages in the superior quadrant OS (Figure 2a). OCT scanning OD was normal, while signs of macular oedema were observed OS (Figure 2b) She underwent 2 courses of inpatient treatment.

DVA at discharge after the first course of treatment was LogMAR 0 OD and LogMAR 0.5 OS. The same readings were reported at discharge after the second course of treatment. DVA at the first follow-up improved to LogMAR 0 OU and was maintained at a second follow-up. Posterior segment examination OS demonstrated resolution of haemorrhages, cotton-wool spots, and tortuosity of blood vessels (Figure 2c). OCT scanning OS showed complete absorption of the subretinal fluid and re-establishment of the foveal contour (Figure 2d).

**Case 3**
A 53-year-old diabetic and hypertensive male presented with a 1-month complaint of foggy vision and inability to see during the morning hours OS. He took some allopathic medicines for the same and got symptomatic relief. He developed the same symptoms later on in the month and came to Sreedhareeyam seeking further options. He is currently under Metformin (1000mg), Thyrox (75mg), and Ecosprin (1mg) for diabetes and hypertension. His immediate family members do not present with similar complaints. His personal history, review of systems, and vital signs were all within normal limits.

Unaided DVA was LogMAR 1 OU, aided DVA was LogMAR 0 OU, and NVA was N18 OD and N12 OS. Anterior segment examination OU was within normal limits. Pupillary examination OU showed normal responses to both direct and consensual reflexes. Posterior segment examination OD showed normal findings, while tortuous blood vessels, cotton-wool spots, and haemorrhages in the superior quadrant were noted OS. (Figure 3a) OCT scanning was normal OD and fluid collection at the macula was noted OS. He was managed on an outpatient basis and had five consultations (Figure 3b).

Unaided DVA at the second consultation improved to LogMAR 0.78 OU and was maintained at the subsequent consultations. Aided DVA was maintained at LogMAR 0 OU and NVA at N12 OD and N18 OS throughout the other consultations. Gradual reduction in haemorrhages, tortuous blood vessels, and cotton-wool spots was observed during the second, third, and fourth consultations (Figure 3c,e,g). OCT scanning showed a gradual reduction of macular oedema during the second and third consultations (Figures 3d,f). At the fourth consultation, OCT scanning was not done and posterior segment examination was by direct ophthalmoscopy. Complete absorption of subretinal fluid and reappearance of the foveal contour was observed on OCT scanning at the fifth consultation. (Figure 3h).
**Additional Information**

The inpatient treatments consisted of Ayurvedic oral medicines (Table 1) and external therapies, which consisted of *Neta Kriyakalpa* (local ophthalmic therapies), treatments for the head, *Sodhana* (bio-purification) procedures, and *Jalaukavacarana* (leeching) (Table 2).

Medicines prescribed at discharge for all patients are indicated in Tables 1 and 2. Timeline of events for all cases is described in Tables 3-5.

All medicines, except Chimiumco tablet, were manufactured at Sreekhareyam Farmherbs India, Pvt. Ltd, the hospital’s GMP-certified manufacturing unit. Chimiumco Tablet was manufactured at J&J Dechane Laboratories, Telangana State, India.8,10

**DISCUSSION**

The pathogenesis of CRVO is believed to follow Virchow’s triad of thrombogenesis, including damage, stasis, and hyper-coagulability of the blood vessels.11-13 External occlusion of the central retinal vein by the sclerotic central retinal artery; occlusion by inflammatory or degenerative primary diseases of the vessel wall; and hemodynamic disturbances produced by factors such as hypotension, arterial spasms, and blood dyscrasias constitute other pathogenic factors for primary thrombus formation and blood stagnation.14 These result in alteration in the vessel’s rheology properties, which ultimately result in stasis, the formation of a thrombus, and occlusion.14,15

The symptoms of the patients may be compared to *Timira* (blurring of vision), a *Drishhtigata Roga* (disease of vision) explained by *Ayurveda*. *Timira* encompasses a range of symptoms starting from *Ayyakta Rupa* (indistinct vision) to *Andhya* (blindness). Immediate and comprehensive management is warranted for *Timira* as it can progress to *Kaca* (diminished vision) and finally to *Linganasas* (complete blindness) if untreated. *Acarya Videha* explains that increased *Doshas* (humours) traverse the *Rupavaha Sira* (vessels of sight) and lodge in the innermost *Patala* (layer) of the *Netra* (eye) to cause *Timira*. *Susruta* explains *Timira* when the *Doshas* settle in the third *Patala*, while *Vagbhata* explains it when the *Doshas* settle in the second *Patala*.17

In these patients, *Acakshushya Ahara* and *Vihara* (diet and lifestyle that are detrimental to eye health) caused *Pitta* (bile) and *Kapha* (phlegm) *Doshas* (senses of humour) to increase. These factors caused *Rakta Dhatu* (blood tissue) to pathologically increase and lodge in the eye because of its *Asraya-Asrayi Bhava* (homologous relationship) with *Pitta*.

*Mandagni* (impaired gastric fire) and the resultant increase of the *Doshas* and *Rakta Dhatu* resulted in compromised delivery of vital nutrients to the eye due to *Sanga* (obstruction) and *VimargaGamana* (diversion of flow to improper places) of the *Raktavaha Srotas* (channels transporting blood).

Oedema and tortuous blood vessels were a direct result of *Sanga* and *VimargaGamana*, in which the retinal blood vessels became pathologically affected and leak serum into the retina. Cotton-wool spots were caused by *Sanga* in the fact that the inadequate supply of nutrients caused by obstruction resulted in hypoxia, which leads to tissue infarction.

The oral medicines enhanced the *Jatharagni* (gastric fire) by *Ama Pacana* (digestion of toxic products), and thus helped to clear up the obstruction in the *Srotas* and allow nutrition to reach both the retina and the eye as a whole.

*Virecana* (therapeutic purgation) enabled absorption of the subretinal fluid and correction of vascular pathology by expelling morbid humour from the body and thus further opening the *Srotas* for delivery of essential nutrients. *Nasya* prevented excess *Kapha* from accumulating in the head.

*Jalaukavacarana* (leeching) expelled impure blood from the eye. This relieved the obstruction in the retinal blood vessels and absorbed sub-retinal fluid, thus enhancing circulation. Leech saliva has more than 100 bio-active substances that possess anaesthetic, anti-inflammatory, anti-coagulant, thrombolytic, anti-edematous, and blood-circulation-enhancing properties.17

*Seka, Netra Dhara, Pindi* and *Purampada* enabled more bio-availability of drugs, enhanced peripheral circulation, enabled faster elimination of toxins, and promoted vaso-dilatation of the blood vessels. *Anjana* allowed minute particles to penetrate through the ocular barriers to reach the target tissue. Absorption of subretinal fluid and reconfiguration of the vascular network of the retina were the results of these treatments as their actions enabled essential nutrients to reach the target tissues.

*Lepa* (application of paste) to the forehead and *Tala* (application of paste on a cotton gauze) to the head facilitated vasodilatation, which allowed faster absorption of toxins and resolution of oedema. *Takradhara* (pouring of medicated buttermilk) facilitated absorption of the subretinal fluid and cooling down of the body.

*Samirapanakam Kvatha* is indicated in *Raktaja* (blood-related) and *Pittaaja* (Pitta-related) disorders. OphthaCap is indicated in disorders of the eye. Some of the key ingredients in these medicines, viz., *Tinospora cordifolia Miers.*, *Terminalia chebula Retz.*, *Terminalia bellercina Linn.*, *Emblica Officinalis Gaertn.*, *Azadirachta indica A. Juss.*, *Adathoda vasica Nees.*, and *Santalum album Linn.*, manage both *Pitta* and *Rakta* by their blood-purifying and vision-promoting properties.

Chimiumco is made from *Rheum emodi*Wall., *Picrorrhiza kurroa* Royle ex. Benth., *Quercus infectoria* Oliv., *Cinnamo-
CONCLUSION

One of the main challenges in these patients was the restoration and maintenance of vision. One of the three patients had complete restoration of vision, while the other two patients’ visual acuity could be maintained. However, satisfactory fundus and OCT findings could be obtained at both discharges and subsequent follow-ups. In the end, the patients themselves were satisfied with the results. The results of this series may be validated with large-sample trials and studies.

ACKNOWLEDGEMENT

The authors thank Sreedhareeyam Ayurvedic Eye Hospital and Research Center, and Sreedhareeyam Farmherbs India Pvt. Ltd., for their help in preparing this case report. The authors acknowledge the immense help received from the scholars whose articles are cited and included in references to this manuscript. The authors are also grateful to the authors/editors/publishers of all those articles, journals, and books from where the literature for this article has been reviewed and discussed.

Conflicts of Interest: None declared

Sources of Funding: None declared

Abbreviations:

CRVO: central retinal vein occlusion
DVA: distant visual acuity
NVA: near visual acuity
OD: oculus dexter
OS: oculus sinister
OU: oculus uterque
OCT: optical coherence tomography

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### Table 1: Oral Medicines

| Medicine                              | Dose  | Anupana (post-prandial drink) | Case | Duration |
|---------------------------------------|-------|-------------------------------|------|----------|
| Kvatha (Herbal Decoctions)            |       |                               |      |          |
| SamirapancakamKvatha*                 | 30mL  | Sukhoshna Jala                | 1    | 5 days   |
| Punarnavadi Kvatha*                   | 30mL  | SamirapancakamKvatha          | 1°   | 2 months |
| Patolamuladi Kvatha*                  | 60mL  | Sukhoshna Jala                | 2    | 13 days  |
| Guducyadi Kvatha*                     | 15mL  | Sukhoshna Jala                | 2    | 25 days  |
| BhunimbadiKvatha                      | 15mL  | Sukhoshna Jala                | 2°   | 2 months |
| AmrtottaramKvatha                     | 15mL  | Sukhoshna Jala                | 2    | 25 days  |
| DasamulaKatutrayamKvatha              | 15mL  | AmrtottaramKvatha             | 2    | 13 days  |
| Kvathaprepared from Kantakari, Tukasi, and Vasa | 15mL  | Sukhoshna Jala                | 2    | 13 days  |
| Tablets                               |       |                               |      |          |
| Guggulu PancapalaTablet               | 1 tablet twice a day after food | Sukhoshna Jala | 1°   | 2 months |
| Triphala Guggulu*                     | 1 tablet twice a day after food | Sukhoshna Jala | 1    | 4 days   |
| SudarsanamTablet*                     |       |                               | 2    | 25 days  |
| Chimiumco Tablet*                     | 1 tablet twice a day after food | Sukhoshna Jala | 3    | 2 months |
| Bilvadi Gutika*                       | 1 tablet twice a day before food | Sukhoshna Jala | 3    | 2 months |
| Ophtha Cap*                           |       |                               | 3    | 2 months |
| Kalka (herbal pastes)                 |       |                               | 1    | 4 days   |
| Kalka prepared from Haridra and Tulasi| 20g   |                               |      |          |

### Table 2: External Purification and Local Therapies

| Treatment                                    | Medicine                       | Procedure                                                                 | Time of Administration | Case No. | Duration |
|----------------------------------------------|--------------------------------|---------------------------------------------------------------------------|-------------------------|----------|----------|
| Sodhana(purification) and Raktamokshana (bloodletting) | Virecana (therapeutic purgation) Avipattikara Yoga* | 6g of the powder was given to the patient in the early morning. The number of urges were recorded | Morning                 | 2        | 5 days   |
|                                              | Pratimarsa Nasya (nasal medication) Anutailla*          | 2 drops of the lukewarm oil were instilled into each nostril.              | Morning                 | 2        | 14 days  |
|                                              | Jalaukavacarana (leeching)                                | The Jalauka (leech) is suspended in a solution of Haridra until it gains motility. It is then applied to the desired spot and made to suck impure blood. Once the patient feels itching or pricking type of pain, the leech is removed. | Morning                 | 1        | 1 day    |
**Table 2: (Continued)**

| Treatment | Medicine | Procedure | Time of Administration | Case No. | Duration |
|-----------|----------|-----------|------------------------|---------|----------|
| Netra Kriyakalpa (Local Ocular Therapeutics) | | | | | |
| Ascyotana (eye drops) | Sunetra Regular* | The patient lies supine and a drop of the medicine is instilled into the eye at the inner canthus. | Twice a day | 1 | 8 days |
| | Darsana Drops* | | | 2 | 2 days |
| | Nalikeranjana | | | 2 | 2 days |
| | Candanadi Anjana | | | | |
| | Netramrtam | | | | |
| Anjana (collyrium drops) | Lodhra, Laksha | A decoction is prepared from the ingredients. This is poured in a thin stream over the closed eyes. | Morning | 1 | 6 days |
| | KasyapamKvatha* | | | 2 | 9 days |
| Seka (pouring of liquids over the eye) | Lodhira, Laksha | A paste is prepared from the ingredients. It is partitioned into two and put on a piece of gauze. This is rolled into a circular bolus and is placed over the closed eyes. | Morning | 1 | 7 days |
| | Nalikeranjana | | | 2 | 9 days |
| | Candanadi Anjana | | | | |
| | Netramrtam | | | | |
| Heat Treatments | | | | | |
| Takradhara | VasaguducyadiKvatha, Amalaki, AmalakiKvatha | 2mL of medicated buttermilk was prepared from 300mL of decoction and 60g of the powder. This was poured over the head in a thin stream with the patient lying supine on the treatment table. | Morning | 2 | 1 day |
| Talapotticchil (paste over the head covered with a plantain leaf) | Manjishta, Lodhira, VasalakshadiChurna | A paste is prepared from the ingredients. It is then applied uniformly over the head. The head is then covered with a plantain leaf. | Morning | 1 | 7 days |
| Tala (paste over the head using a square piece of cotton) | VasaguducyadiKasha, | A paste is prepared from the ingredients and placed on a cotton gauze, which is applied to the centre of the patient's scalp. | Evening | 1 | 7 days |
| | KacchuradiChurnaand NimbamrtaDhura Taila | | | | |
| Lepa (application of paste) over the forehead | AmalakiChurna mixed with milk | A paste prepared from the ingredients was applied over the forehead. | Morning | 1 | 4 days |
| | AmalakiCurna, milk | | | 2 | 3 days |
| | Musta and Amalaki | | | 3 | 2 months |
Table 3: Timeline of Events: Case 1

| Date          | Event                                                                 |
|---------------|----------------------------------------------------------------------|
| September 2016 | • Patient first experiences blurring of vision                        |
| October 2016 - March 2017 | • Advised intra-vitreal injection of anti-VEGF by an ophthalmologist, which she denies. |
| April 8th, 2017 | • Consults Sreedhareeyam Hospital and is advised inpatient management. She gets admitted for an 8-day course of treatment. |
|               | • DVA (unaided): LogMAR 1 OD, LogMAR 0 OS                           |
|               | • NVA: N6 OU                                                         |
|               | • Anterior segment examination: Within normal limits OU              |
|               | • Pupils: Sluggish with no afferent pupillary defect OD, normal reactions OS |
|               | • Posterior segment examination: tortuous blood vessels cotton-wool spots, and a few haemorrhages in the superior and inferior quadrants OD, normal findings OS |
|               | • OCT: cystoid macular oedema OD, normal findings OS               |
|               | • Ascycotana is started.                                            |
| April 9th, 2017 | • Seka, Pindi, Talapotichil, and Lepa over the forehead are started. |
|               | • SamirapancakamKvatha, PunarnavadiKvatha, and PatolamuladiKvathaare started. |
| April 10th, 2017 | • Tala is started.                                                  |
| April 11th, 2017 | • Jalaukavacaranais done.                                            |
|               | • Kalka with Haridra and Tulasi, and Triphala Guggulu are started. |
| April 12th, 2017 | • Lepa over the forehead is stopped.                                |
|               | • Lepa over the temporal region is started.                         |
| April 14th, 2017 | • Seka and Lepa over the temporal region are stopped.                |
| April 15th, 2017 | • All treatments and oral medicines are stopped. The patient is discharged. |
|               | • DVA (unaided): LogMAR 1 OD, LogMAR 0 OS                           |
|               | • NVA: N6 OU                                                         |
|               | • Posterior segment examination: the resolution of tortuous blood vessels, cotton-wool spots and haemorrhages OD |
|               | • OCT: resolution in the cystic lesions OD                          |
| September 24th, 2018 | • DVA (unaided): LogMAR 1 OD, LogMAR 0 OS                           |
|               | • NVA: N6 OU                                                         |
| March 23rd, 2019  | • DVA (unaided): LogMAR 0.77 OD, LogMAR 0 OS                       |
|               | • NVA: N6 OU                                                         |
| January 23rd, 2020 | • DVA (unaided): LogMAR 0.77 OD, LogMAR 0 OS                       |
|               | • NVA: N6 OU                                                         |

Table 4: Timeline of Events: Case 2

| Date          | Event                                                                 |
|---------------|----------------------------------------------------------------------|
| August 2014   | • Patient experiences blurring of vision OS. She gets diagnosed with non-ischemic CRVO by an ophthalmologist |
|               | • She undergoes one round of anti-VEGF injection but gets marginal relief |
| October 2014  | • Consults Sreedhareeyam Hospital and is advised inpatient management |
|               | • DVA: LogMAR 0 OD, LogMAR 0.78 OS                                   |
|               | • NVA: N6 OD, N8 OS                                                  |
|               | • Anterior segment examination: Within normal limits OU              |
|               | • Pupils: normal responses to direct and consensual reflexes OU      |
|               | • Posterior segment examination: Normal findings OD, haemorrhages, cotton-wool spots, tortuous blood vessels OS |
|               | • OCT: normal findings OD, macular oedema OS                        |

First Course of Treatment (04/10/2014 - 28/10/2014)

| Date          | Event                                                                 |
|---------------|----------------------------------------------------------------------|
| October 4th, 2014 | • Admitted for the first course of treatment                          |
|               | • Oral medicines are started                                         |
| October 5th, 2014 | • Anjana is started.                                                 |
Table 4: (Continued)

| Date          | Event                                                                 |
|---------------|----------------------------------------------------------------------|
| October 6th, 2014 | • Anjana is stopped  
                   | • Tala with KaccuradiChurnaand NimbamrtadiEranda Taila is done  
                   | • Pratimarsa Nasya with Anutailais done |
| October 7th, 2014 | • Talapoticchil with Vasa, Yashtimadhu, Musta, Satavari, and Amalaki mixed with Vasaguducyadi Kashaya is started  
                   | • Lepa with Amalakiand Takra is started  
                   | • Purampada with MukkadiPurampadais done |
| October 8th, 2014 | • Pindi with Biphytum sensittivumis started |
| October 11th, 2014 | • Talapoticchil and Lepa are stopped |
| October 13th, 2014 | • Pindi is stopped |
| October 15th, 2014 | • Lepa, Talapoticchil, and Pindi are restarted |
| October 17th, 2014 | • Talapoticchil is stopped |
| October 19th, 2014 | • Virecana with Avipattikara Yoga is done |
| October 20th, 2014 | • Tala and Pratimarsa Nasya are restarted |
| October 21st, 2014 | • Virecana is done |
| October 23rd, 2014 | • Virecana, Pratimarsa Nasya, Tala, Lepa, and Pindi are stopped |
| October 25th, 2014 | • All treatments are stopped. The patient is discharged.  
                   | • DVA: 6/6 OD and 6/18 OS  
                   | • NVA: N6 OD, N8 OS |

Second Course of Treatment (15/01/2015 - 29/01/2015)

15/01/2015 | • Oral medicines are started  
            | • Seka is started  
            | • Anjana is started  
            | • Tula is started |
16/01/2015 | • Tala is stopped  
            | • Pratimarsa Nasya is started  
            | • Talapoticchil with is started |
21/01/2015 | • Pratimarsa Nasya is stopped |
22/01/2015 | • Anjana is stopped  
            | • Talapoticchil is stopped  
            | • Netra Picu is started |
23/01/2015 | • Seka is stopped  
            | • Takradharais done |
27/01/2015 | • Sirolepa with is started |
29/01/2015 | • All medicines and treatments are stopped. The patient is discharged.  
            | • DVA: LogMAR O OD, LogMAR 0.5 OS |
25/08/2016 | • DVA: LogMAR O OU |
01/01/2018 | • DVA: LogMAR O OU  
            | • Posterior segment examination: reduction in cotton-wool spots and tortuous blood vessels, and re-establishment of the foveal reflex OS  
            | • OCT: absorption of subretinal fluid OS |
**Table 5: Timeline of Events: Case 3**

| Date                | Event                                                                 |
|---------------------|-----------------------------------------------------------------------|
| **August 2018**     | The patient first experienced fogginess of vision and inability to see in the morning hours. He is administered medicines; these provide symptomatic relief |
| **September 9th, 2018** | Consults at Sreedhareeyam Eye Hospital. Visual Acuity (VA) Posterior Segment Examination OCT Medicines |
|                     | Unaided DVA: LogMAR 1 OU Aided DVA: LogMAR 0 OU NVA: N12 OD, N18 OS | Haemorrhages, tortuous blood vessels, cotton-wool spots | Macular oedema | Samirapancakam Kashaya* Ophtha Cap* BilvadiGutika Lepa with Musta and Amalaki |
| **September 24th, 2018** | Unaided DVA: LogMAR 0.78 OU Aided DVA: LogMAR 0 OU NVA: N12 OD, N18 OS | Reduction in haemorrhages and tortuous blood vessels | Reduction in macular oedema | Samirapancakam Kashaya* Chimiumco Tablet^ BilvadiGutika Lepa with Musta and Amalaki |
| **December 10th, 2018** | Unaided DVA: LogMAR 0.78 OU Aided DVA: LogMAR 0 OU NVA: N12 OD, N18 OS | Reduction in haemorrhages and tortuous blood vessels | Reduction in macular oedema | Samirapancakam Kashaya* Chimiumco Tablet^ BilvadiGutika Lepa with Musta and Amalaki |
| **April 1st, 2019** | Unaided DVA: LogMAR 0.78 OU Aided DVA: LogMAR 0 OU NVA: N12 OD, N18 OS | Reduction in tortuous blood vessels | - | Samirapancakam Kashaya* Chimiumco Tablet BilvadiGutika Lepa with Musta and Amalaki |
| **May 27th, 2019**  | Unaided DVA: LogMAR 0.78 OU Aided DVA: LogMAR 0 OU NVA: N12 OD, N18 OS | Complete resolution of haemorrhages, tortuous blood vessels, and cotton-wool spots | The reappearance of the foveal contour | Samirapancakam Kashaya* Chimiumco Tablet BilvadiGutika Lepa with Musta and Amalaki |

*Patented medicines of Sreedhareeyam Ayurvedic Eye Hospital and Research Center
^Patented medicine of J&J Dechane Laboratories, Hyderabad, Telangana State, India
°Prescribed at discharge
IMAGES: CASE 1

Figure 1a: Posterior segment examination OD at admission.

Figure 1b: OCT examination OD at admission.

Figure 1c: Posterior segment examination OD at discharge.

Figure 1d: OCT Scanning OD at discharge.

IMAGES: CASE 2

Figure 2a: Posterior segment examination OS at admission.

Figure 2b: OCT scan OS at admission.

Figure 2c: Posterior segment examination OS at discharge.

Figure 2d: OCT scan OS at discharge.
**IMAGES: CASE 3**

**Figure 3a:** Posterior segment examination OS on September 9th, 2018.

**Figure 3b:** OCT scan OS on September 9th, 2018.

**Figure 3c:** Posterior segment examination OS on September 24th, 2018.

**Figure 3d:** OCT scanning OS on September 24th, 2018.

**Figure 3e:** Posterior segment examination OS on December 10th, 2018.

**Figure 3f:** OCT scanning OS on December 10th, 2018.

**Figure 3g:** Posterior segment examination OS on May 27th, 2019.

**Figure 3h:** OCT scanning OS on May 27th, 2019.