

## **Automatic measurement of choroidal thickness with SS-OCT as a clinical method of follow-up in acute Western Europe Vogt-Koyanagi-Harada disease.**

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### Case summary

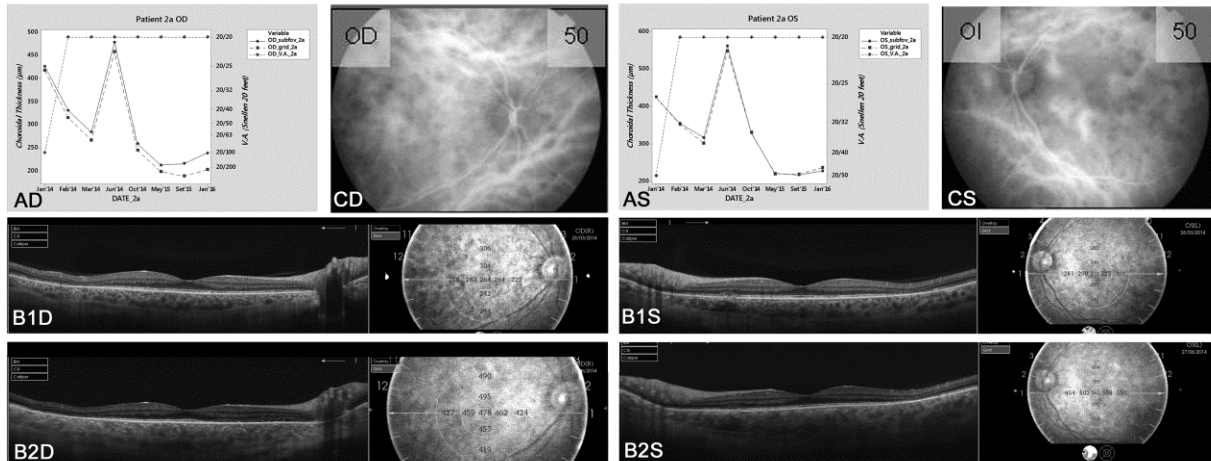
Prospective, longitudinal case-control study of 9 acute VKH disease Caucasian patients during 2 years follow-up. Choroidal thickness was automatically measured by SS-OCT (prototype Atlantis DRI-1 OCT, Topcon). The course of choroidal thickness was analyzed and compared with visual acuity (VA) and indocyanine green angiography (ICGA). Images of 18 eyes of patients were compared to 24 eyes of normal subjects. At baseline the mean subfoveal choroidal thickness (SFCT) in acute VKH was 667  $\mu\text{m}$  versus 303  $\mu\text{m}$  in matched controls ( $p=0.00$ ) and at study end SFCT was 328  $\mu\text{m}$  versus 298  $\mu\text{m}$  ( $p=0.371$ ). There was an association between VA and SFCT, decreasing the thickness and increasing VA with treatment and increasing the thickness with decreasing of VA in posterior relapses. From 16 diagnosed posterior relapses with an increased SFCT 10 (62.5%) had no decrease in VA although signs of inflammation were found with ICGA. So SS-OCT could not only check response to treatment but also diagnose asymptomatic relapses.

Automatic measurement of choroidal thickness was a non invasive and fast way of detecting posterior recurrent inflammation used in the clinical practice. SS-OCT could reduce the need of ICGA for the follow-up of VKH patients.

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Figure 1

Patient's 2 follow-up of choroidal thickness measurements and visual acuity. Comparison of swept-source optical coherence tomography image and indocyanine green angiography of a bilateral posterior relapse.



**A:** Subfoveal choroidal thickness (SFCT) and grid choroidal thickness in micrometers ( $\mu\text{m}$ ) and Snellen visual acuity (VA) of patient 2 throughout the study (**AD** right eye, **AS** left eye) from January 2014 to January 2016. There was an asymptomatic posterior recurrence diagnosed by SS-OCT in March 2014; no other signs of inflammation in the eye were observed but the relapse was confirmed with ICGA. At study completion, choroidal thickness and VA were normal (239  $\mu\text{m}$  right eye, 228 $\mu\text{m}$  left eye).

**B:** SS-OCT images with choroidal thickness in  $\mu\text{m}$ . Right eye (**B1D**) and left eye (**B1S**) in February 2014. Choroidal thickness was normal ( $< 320 \mu\text{m}$ ) in both eyes without retinal anomalies. **B2:** SS-OCT March 2014 with increased SFCT: 478  $\mu\text{m}$  in right eye (**B2D**) and 562  $\mu\text{m}$  in left eye (**B2S**), no retinal lesions.

**C:** Indocyanine green angiography of right eye (**CD**) and left eye (**CS**), March 2014 where inflammation was confirmed (hypopigmented spots and hyperfluorescence of choroidal vessels).

Table

## Analysis of relapses during follow-up

|           | VA Pre-Relapse | VA at Relapse | Decrease in vision | SFCT (µm) Pre-Relapse | SFCT (µm) at Relapse | Increase in Thickness | Change in treatment  | Months since diagnosis at R | Years at study end |
|-----------|----------------|---------------|--------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------------|--------------------|
| P1 1R OD  | 1              | 1             | no                 | 296                   | 363                  | 67                    | No(assay)            | 7                           | 2                  |
| P1 2R OS  | 1              | 1             | no                 | 363                   | 415                  | 52                    | No (assay)           | 7                           | 2                  |
| P1 3R OS  | 1              | 0.9           | yes                | 434                   | 465                  | 31                    | No(patient rejected) | 16                          | 2                  |
| P1 4R OD  | 0.7            | 0.025         | yes                | 297                   | 900                  | 603                   | Yes new biolog       | 17                          | 2                  |
| P1 5R OS  | 0.7            | 0.7           | no                 | 358                   | 416                  | 58                    | Yes (bilateral R)    | 17                          | 2                  |
| P2 6R OS  | 1              | 1             | no                 | 284                   | 478                  | 192                   | Yes >PDN             | 5                           | 2                  |
| P2 7R OD  | 1              | 1             | no                 | 317                   | 562                  | 245                   | Yes +Imurel          | 5                           | 2                  |
| P3 8R OD  | 0.9            | 0.9           | no                 | 505                   | 680                  | 175                   | Yes >PDN             | 4                           | 2                  |
| P3 9R OS  | 0.9            | 0.9           | no                 | 417                   | 478                  | 61                    | Yes (bilateral R)    | 4                           | 2                  |
| P5 10R OS | 1              | 0.8           | yes                | 340                   | 1000                 | 660                   | Yes >PDN             | 1                           | 1                  |
| P5 11R OD | 1              | 1             | no                 | 339                   | 401                  | 62                    | Yes >PDN             | 11                          | 1                  |
| P5 12R OS | 1              | 1             | no                 | 392                   | 485                  | 91                    | Yes +MMF             | 11                          | 1                  |
| P6 13R OS | 1              | 1             | no                 | 346                   | 534                  | 188                   | Yes >PDN             | 6                           | 1                  |
| P6 14R OD | 0.75           | 0.4           | yes                | 383                   | 438                  | 55                    | Yes +MMF             | 8                           | 1                  |
| P6 15R OD | 1              | 0.4           | yes                | 388                   | 468                  | 80                    | Yes +CsA             | 11                          | 1                  |
| P6 16R OS | 1              | 0,25          | yes                | 382                   | 438                  | 56                    | Yes +biologic        | 11                          | 1                  |

P patient, R relapse, OD right eye, OS left eye, VA visual acuity(decimal), SFCT subfoveal choroidal thickness, µm micrometers, PDN prednisone, MMF micofenolate mophetil, CsA cyclosporine A