INFLAMMATORY CHOROIDAL NEOVASCULARIZATION IMAGED BY OPTICAL COHERENCE TOMOGRAPHY – ANGIOGRAPHY

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Background:

To describe the optical coherence tomography - angiography (OCT- A) findings in patients with inflammatory choroidal neovascularization (CNV).

Patients & Methods:

Inclusion criteria :

All patients diagnosed with inflammatory CNV at the Pitie Salpetriere hospital between 2016/09/01 and 2017/01/17.

Methods:

All patients were assessed including best corrected visual acuity, clinical inflammatory parameters, multimodality imaging, FA, ICG and SD-OCT or SS-OCT. All patients underwent OCT angiography with SS-OCT DRI Triton (Topcon, Japan) or/and Spectralis Angiography OCT (HRA, Heidelberg, Germany). OCT-A images were analyzed and compared with structural OCT B-scan.

Results:

Clinical features of patients:

- 9 eyes, 8 patients, 3 M/5 W
- Median age of patients: 55 years
- Mean duration of uveitis : 24.6 months
- Uveitic etiologies : ocular sarcoidosis (3), Birdshot retino-choroidopathy (1), sympathetic ophthalmia (1), punctate inner choroidopathy (PIC) (1), HSV 2 chronic retinitis (1) and presumed tuberculosis-related chorioretinopathy (1).

OCT-A findings: type 2 CNV.

- location : sub foveal (5), papillo-macular (2) and eccentric (2).
- well-defined shape with multiple anastomosis and loops (9/9), tiny capillaries network (9/9), peripheral arcades (8/9), surrounded by a dark halo on Bruch segmentation (7/9) ; mask effect of retinal hemorrhages (2/9).
- CNV as a complication of stromal inflammatory choroiditis seems to have higher voluminous signal, multiple thicker pedicles, less branching and less vessel termini (figures 1 and 2). On the contrary, CNV as a complication of primary inflammatory choriocapillaropathies seems to be smaller, with “glomerule” shape, a single pedicle, many tiny branching, as AMD neo-vessels type 2.

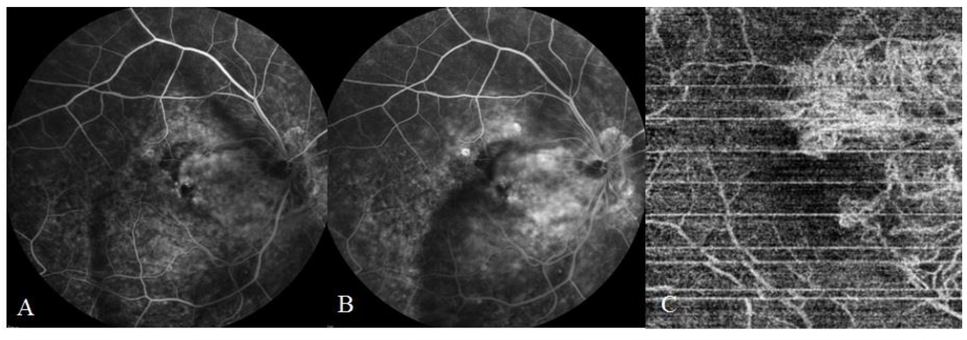

Figure 1. OD. Inflammatory CNV is hyperfluorescent on the early phase of angiogram and there is a progressive leakage in the overlying subsensory retinal space during the late phases of angiograms, despite the mask effect of hyalitis (A and B). *En face* OCT – A at the level of choriocapillaris : neovascular membrane appears as a well-defined network with large anastomotic arcade and multiple pedicles.

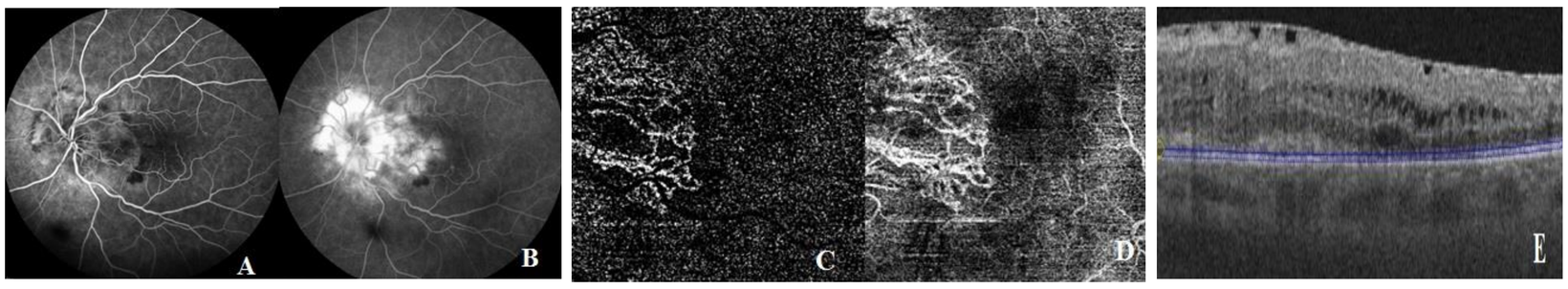

Figure 2. Multimodal imaging of the left eye of 58-year-old woman showing active inter papillo macular inflammatory CNV complicating ocular sarcoidosis, similar with the first case (figure 1) even if tiny capillaries and interconnexions seem to be rare.
Early and late phases of FA show a type 2 CNV (A and B). En face OCT-A segments of outer retina and choriocapillaris layers (C and D) show hyper-flow CNV. In B - scan, CNV appears as a discrete gray lesion above retinal pigment epithelium (E). Cystoid spaces already exist and could be explained by both macular edema and tractional epiretinal membrane.

OCT-A findings one month after anti-VEGF therapy:

After the optimization of anti inflammatory treatment and one anti-VEGF IVI, iCNV remain active for 5/8eyes.

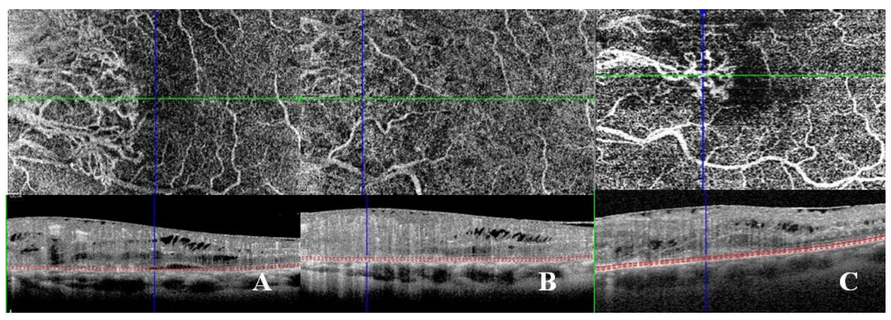

Figure 3. *En face* OCT-A segment of choriocapillaris of the same patient (figure 2). One month after anti VEGF injection, large CNV has completely disappeared (A and B) but relapsed at 6 weeks (C) with the same pattern, large truck vessel, loops, anastomosis arcade and peripheral dark ring

Discussion:

Inflammatory CNV is a rare complication of posterior uveitis or panuveitis reported in 2.3 – 4.6%, with a higher prevalence for PIC (≈70%), multifocal choroiditis (≈ 30%), serpiginous choroiditis and VKH uveitis (≈ 10%)

Advantages of OCT-A for inflammatory CNV :

- Its ability to detect CNV, earlier and before it becomes an exudative lesion. It seems to be a new complementary exam, particularly in case of equivocal AF (the distinction between inflammatory lesion of CMF or PIC and iCNV could be difficult with AF). Structural SD-OCT permits to detect indirect exudative signs of inflammatory CNV.
- Its ability to discriminate inflammatory CNV from sub retinal inflammatory or fibrotic tissue.
- Its ability to monitor the evolution of inflammatory CNV after systemic anti-inflammatory treatment (corticosteroid and/or immunosuppressive drugs) . The high rate of re treatment could be explained by the persistence of active arcade in OCT-A .
- Limits : small cohort of patients, the lack of CNV vessel area measurement and the limits of OCT-A technology, projection artefacts and segmentation errors.

Conclusion:

OCT-A seems to be a useful new imaging method to monitor inflammatory CNV. Nevertheless, further studies on a larger number of patients with a longer follow-up are needed before any further conclusions. OCT-A will allow better understanding of the changes of CNV over time and a better anti-inflammatory and anti-VEGF treatment adjustment.