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Acute Posterior Multifocal Placoid Pigment Epitheliopathy

Alain Gaudric



Service d'Ophtalmologie
Hôpital Lariboisière



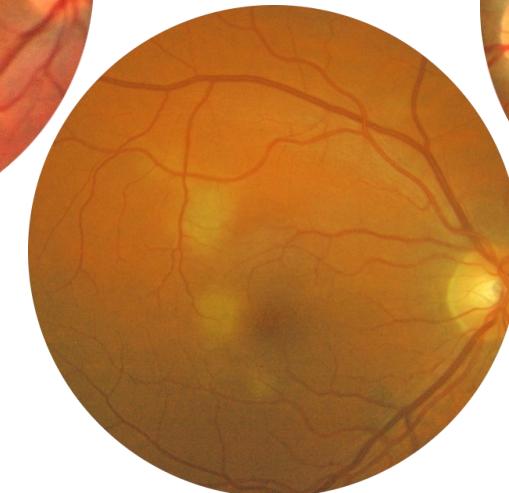
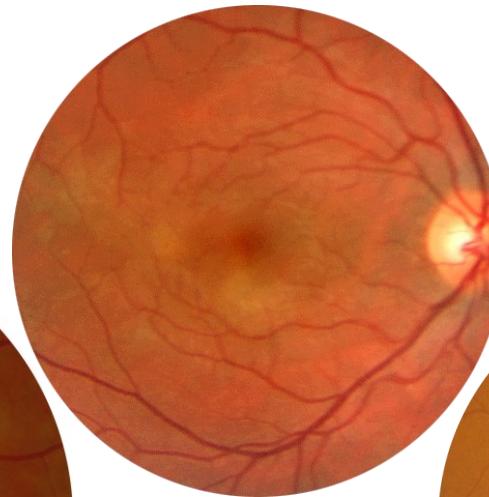
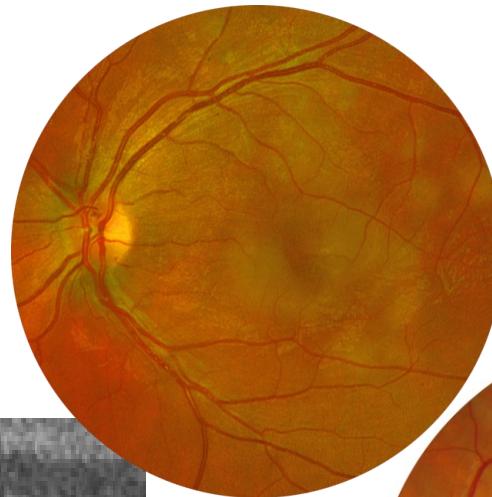
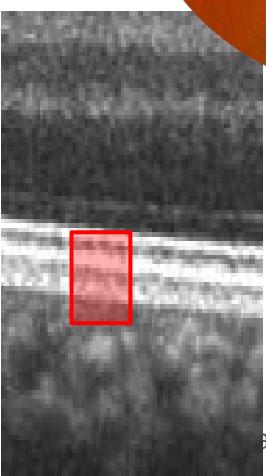
EURETINA
European Society of Retina Specialists

Educational Webinar Series

Épithéliopathie en plaques (APMPPE)

- L'épithéliopathie en plaques est en fait une "choriocapillarite"
 - avec lésions ischémiques sus jacentes de l'EP

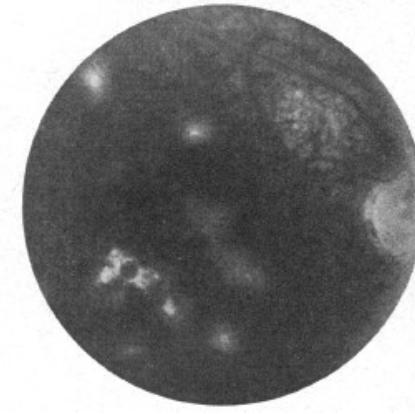
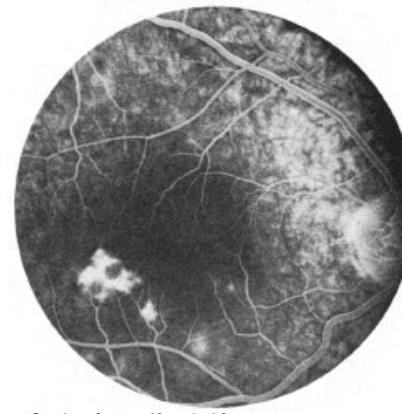
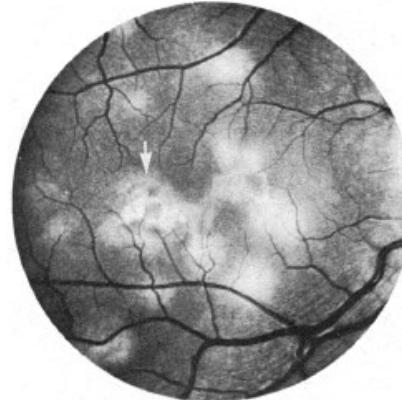
Deutman AF, et al. Acute posterior multifocal placoid pigment epitheliopathy. Pigment epitheliopathy of choriocapillaritis? Br J Ophthalmol. 1972;56(12):863-874.



Acute Posterior Multifocal Placoid Pigment Epitheliopathy

Acute Posterior Multifocal Placoid Pigment Epitheliopathy

J. Donald M. Gass, MD, Miami, Fla



THIS REPORT presents the clinical and fluorescein angiographic findings in three healthy young adult female patients who presented similar and peculiar ophthalmoscopic pictures. Each developed rapid loss of central vision secondary to multiple subretinal lesions resembling initially a disseminated embolic choroiditis. Spontaneous resolution of the lesions was rapid and was accompanied by marked visual improvement *dorsum prominent and permanent derangement*.

■ JDM Gass 1968

- 3 young adult females
- Subretinal yellow plaques
 - RPE opacification
- Fluorescein angiography
 - Early hypofluorescence by blockage of the background fluorescence
 - Late incomplete staining
 - Absence of serous retinal detachment
 - Absence of damage to the choroid
- Rapid resolution
 - Visual prognosis relatively good



JDM Gass 1923-2005

Controversies on the pathogenesis

Pigmentary Epitheliopathy and Erythema Nodosum

Arch Ophthalmol. 1971;85(3):369-372.

E. Michael Van Buskirk, MD;

Simmons Lessell, MD; and

Ephraim Friedman, MD, Boston

"This appears to represent delayed choriocapillaris filling rather than areas masking underlying choroidal fluorescence ... suggestive of focal choroidal vasculopathy"

Acute posterior multifocal placoid pigment epitheliopathy

Pigment epitheliopathy or choriocapillaritis

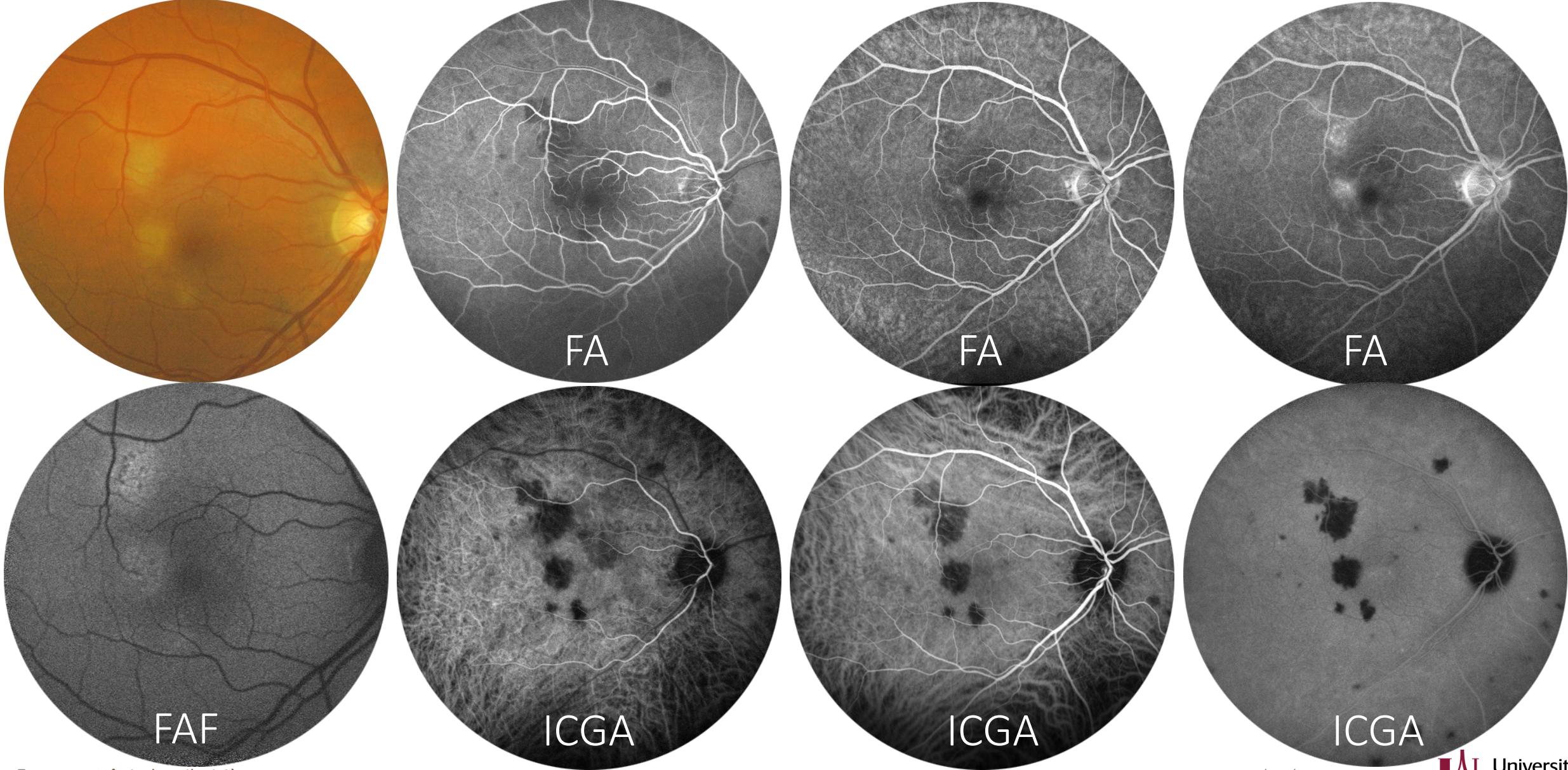
Br J Ophthalmol. 1972;56(12):863-874.

A. F. DEUTMAN, J. A. OOSTERHUIS, T. N. BOEN-TAN, AND
A. L. AAN DE KERK

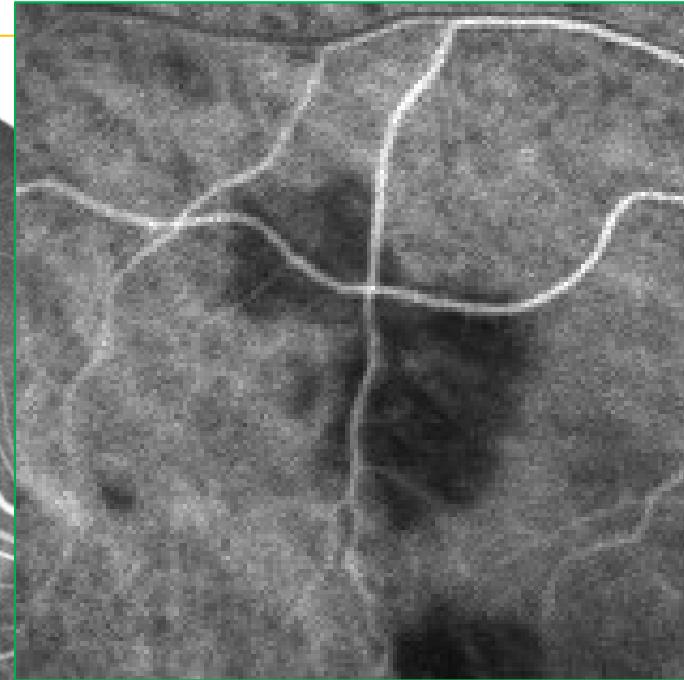
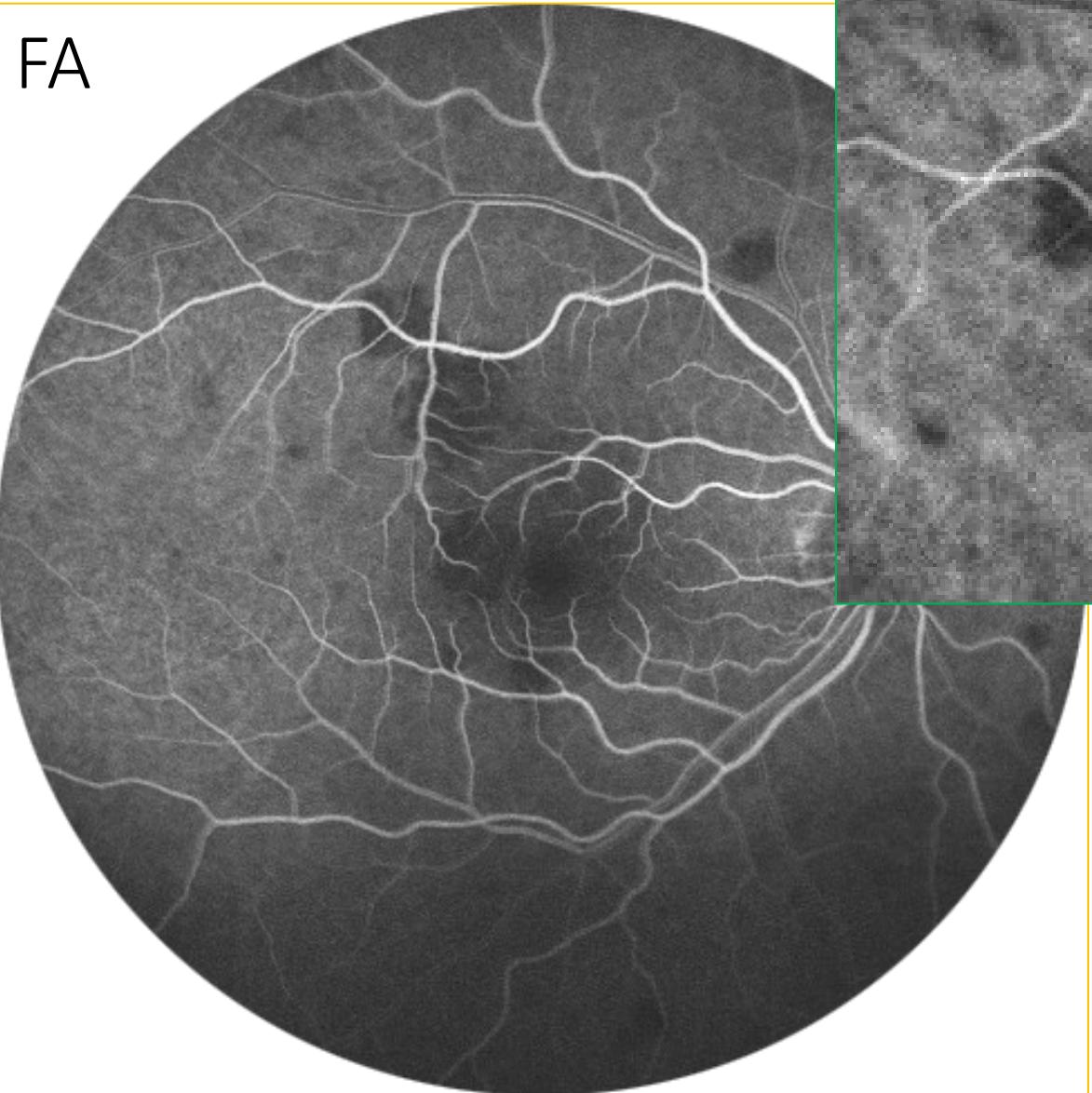
We do not think that the initially non-fluorescent patches are due to defective choroidal filling.

It is possible that this entity reflects an acute inflammation of the choriocapillaris which affects the pigment epithelium. We suggest the term "acute multifocal choriocapillaritis"

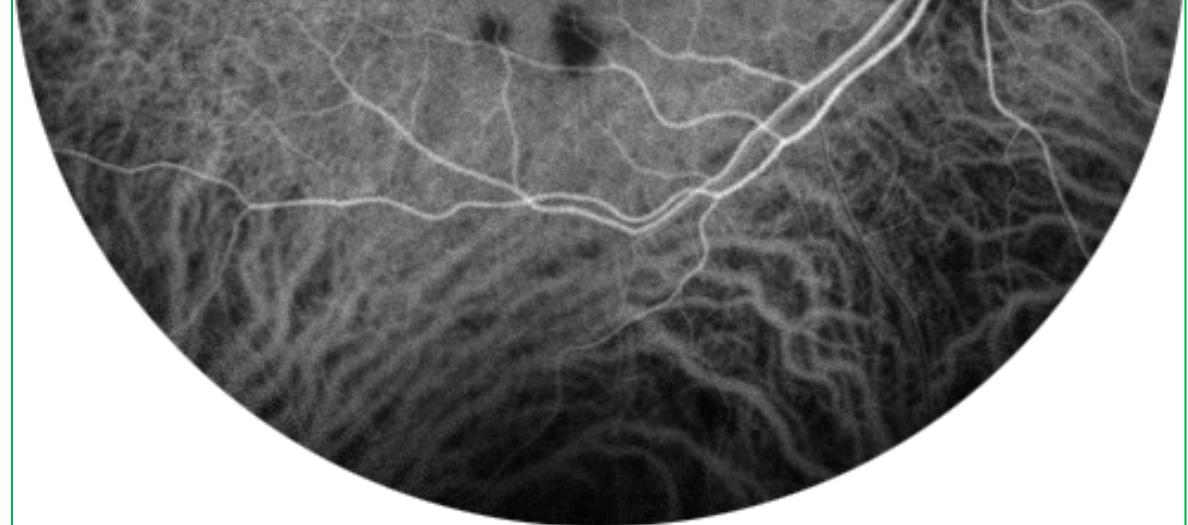
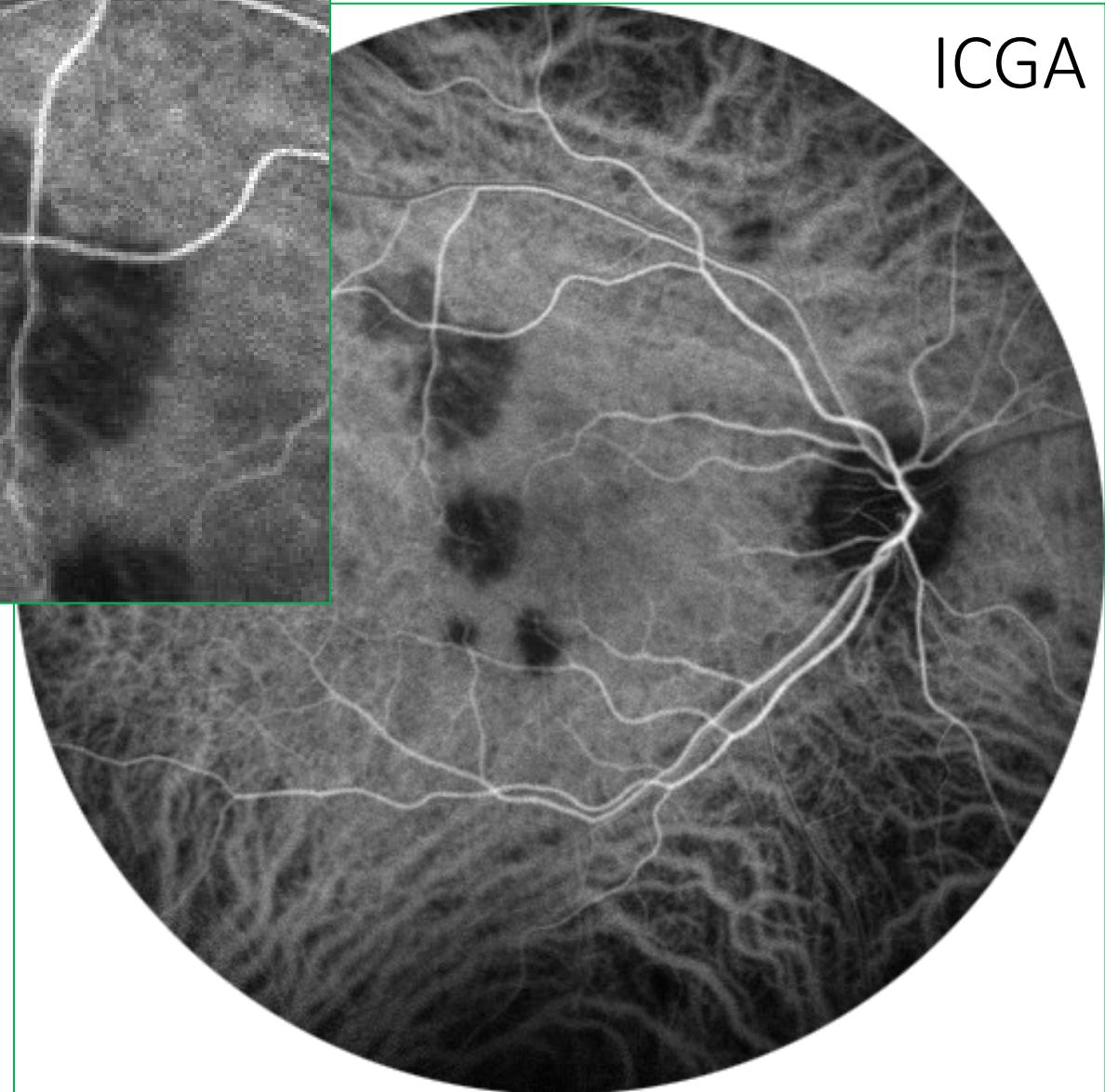
APMPPE Multimodal imaging



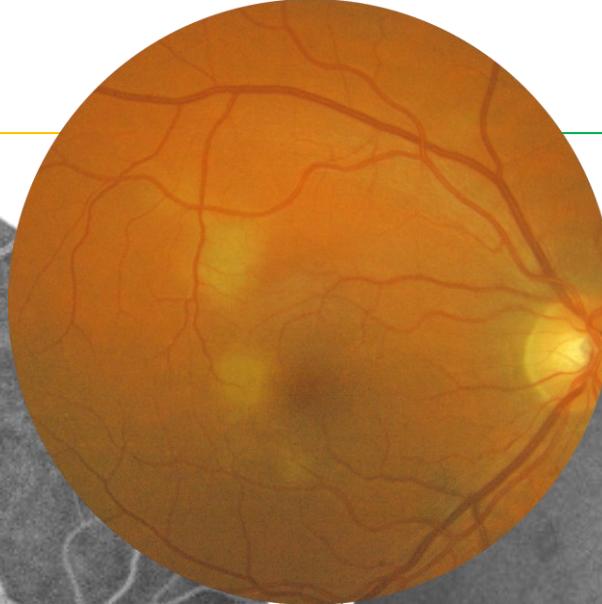
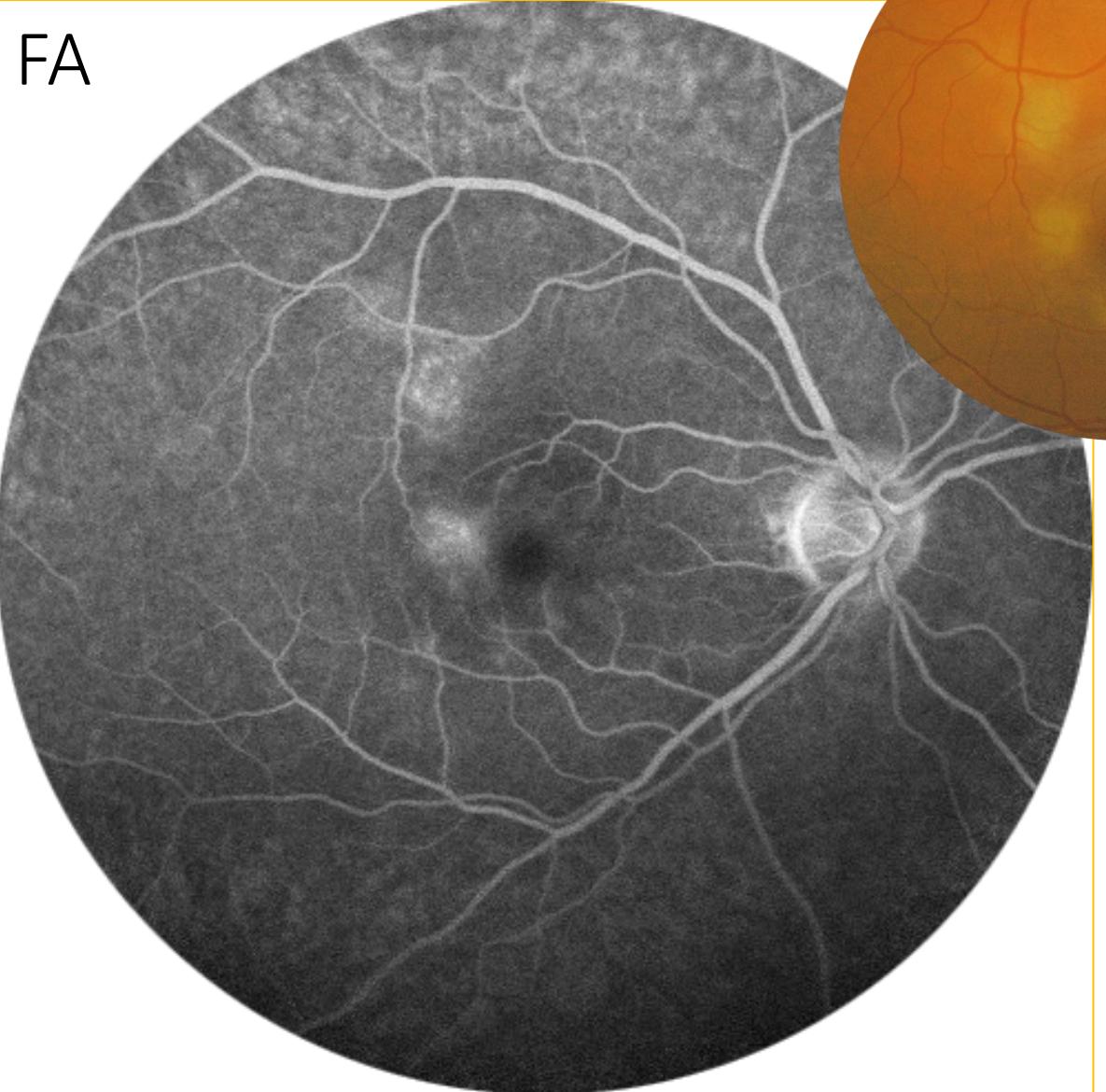
FA



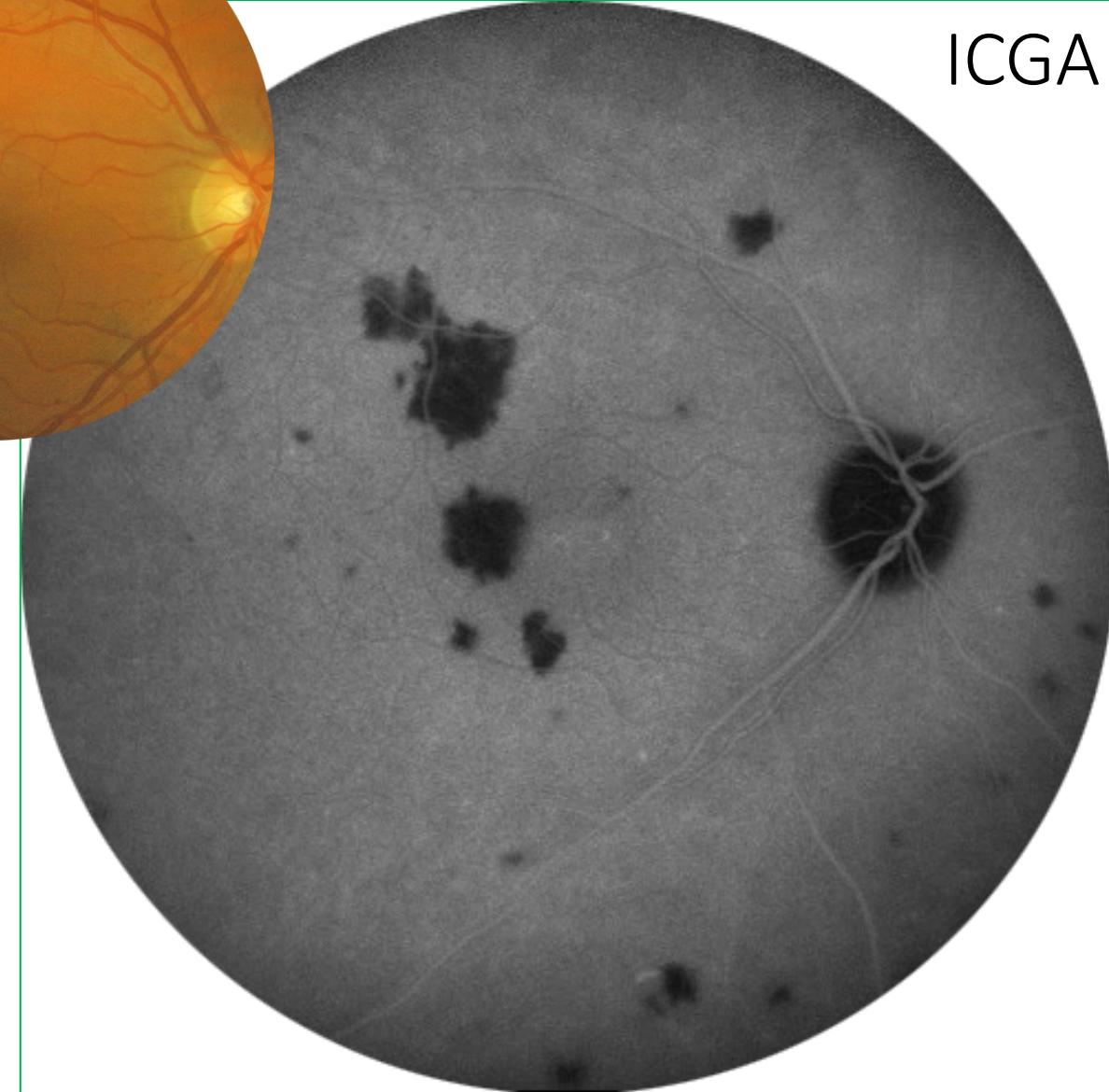
ICGA



FA

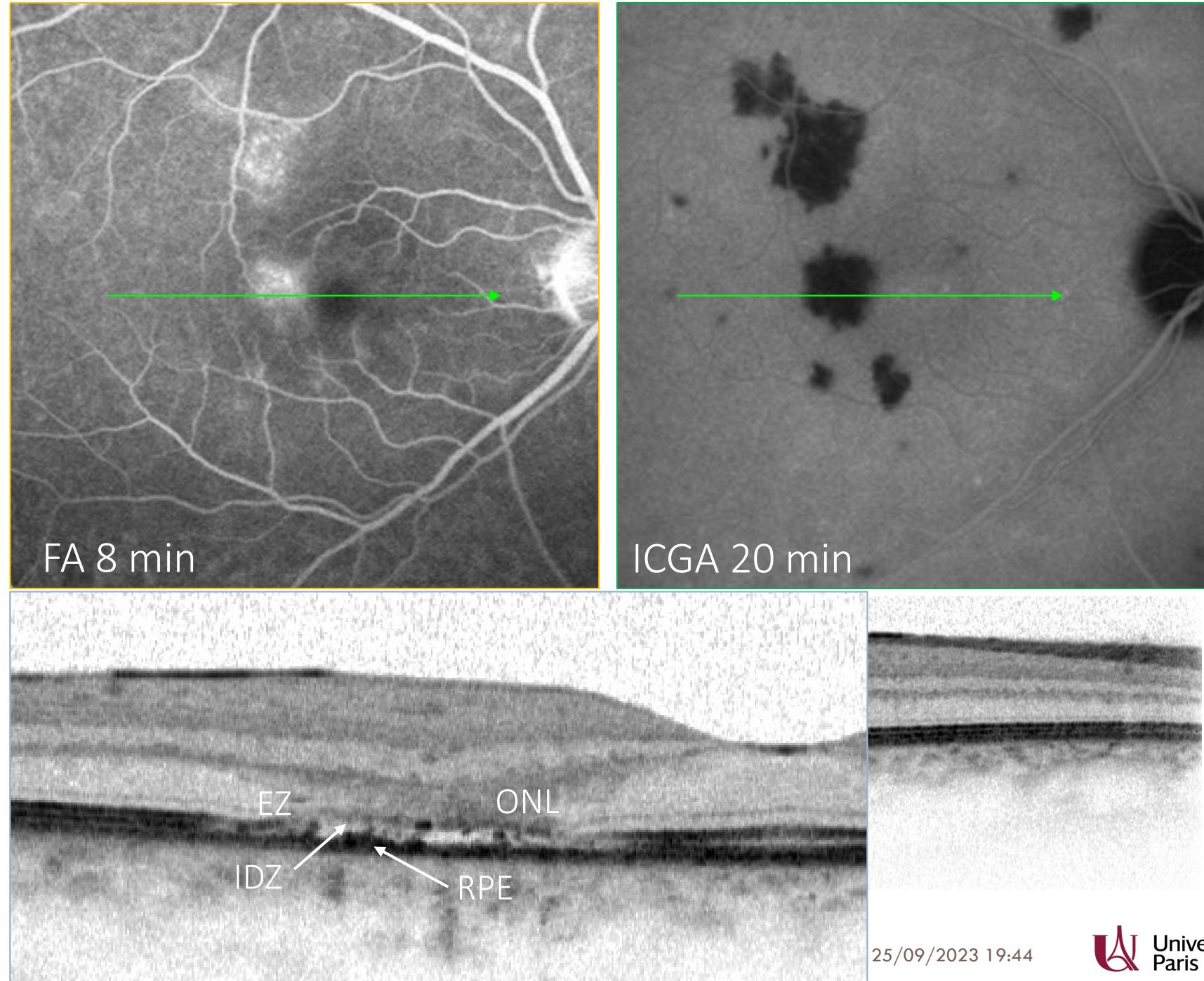


ICGA

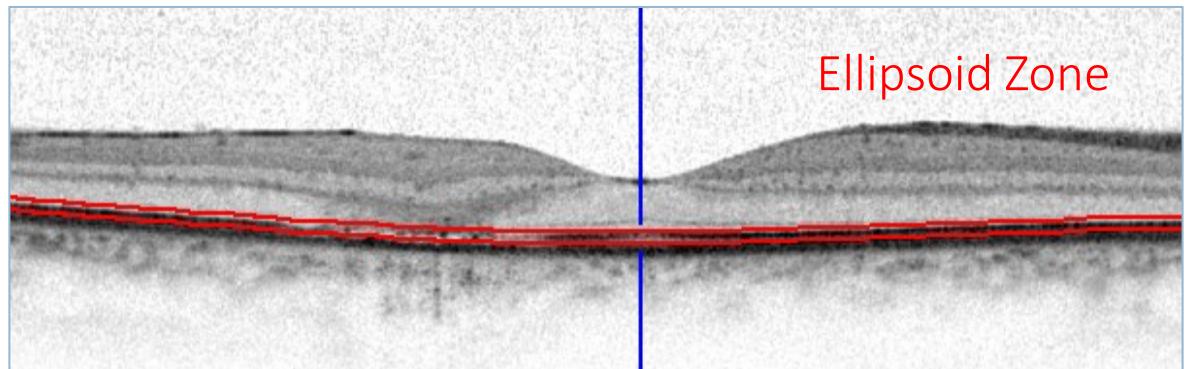
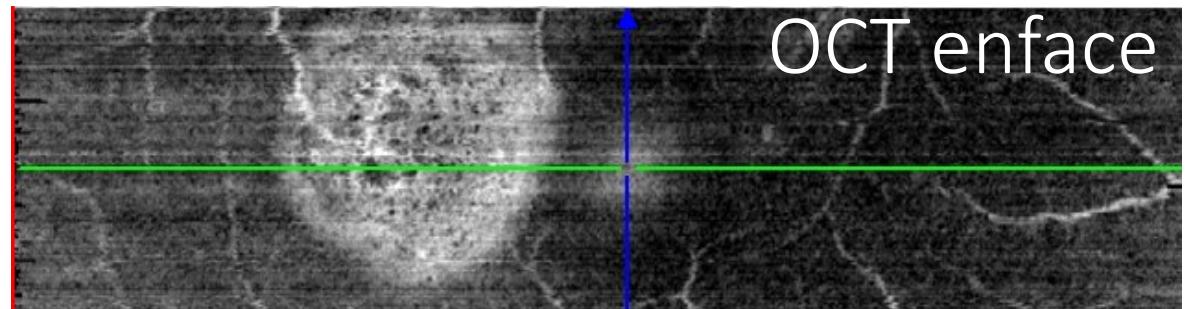
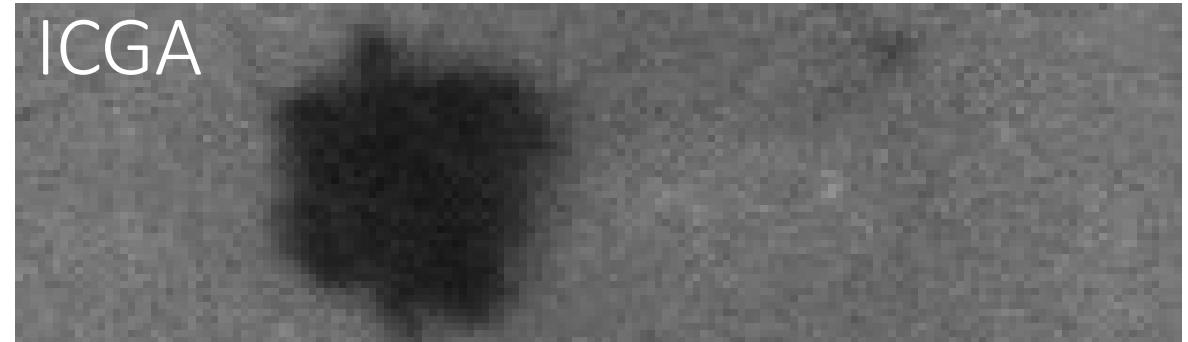


APMPPE Multimodal imaging OCT

- Plaques visible on FA and ICGA correspond to
 - ONL hyperreflectivity
 - EZ disruption
 - IDZ fragmentation
 - RPE granulations

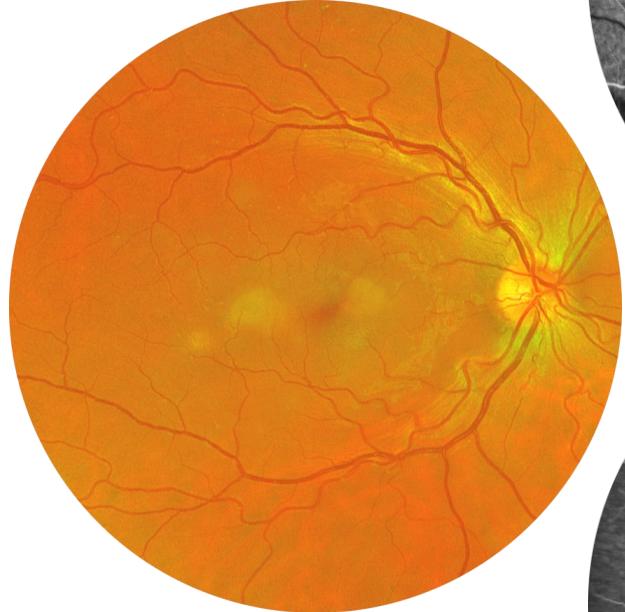


APMPPE Multimodal imaging



APMPPE

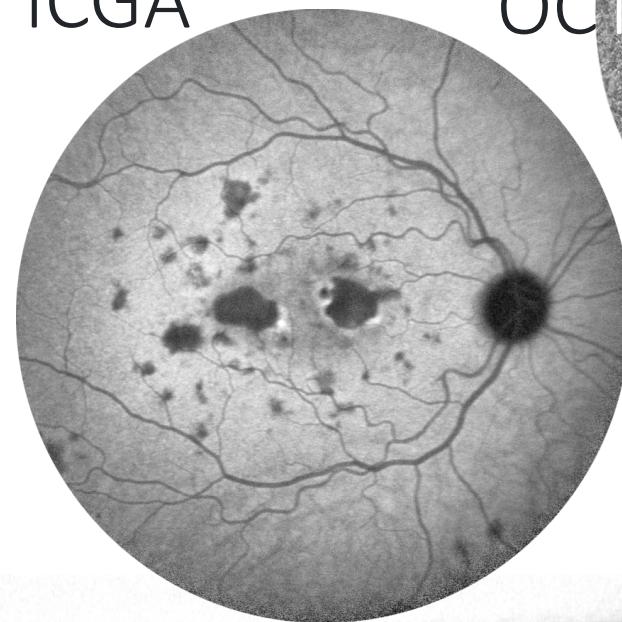
Multimodal imaging



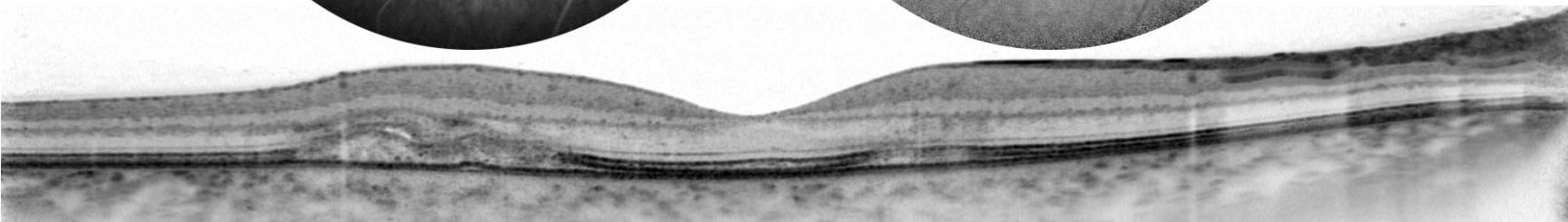
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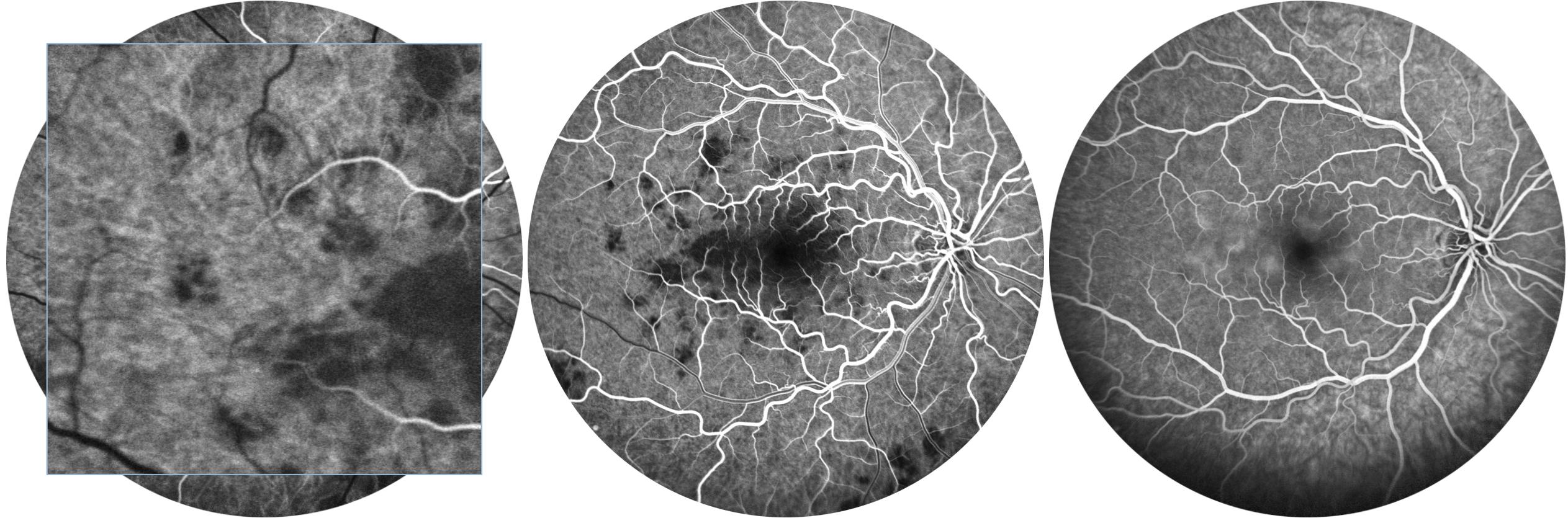
ICGA



OCTA

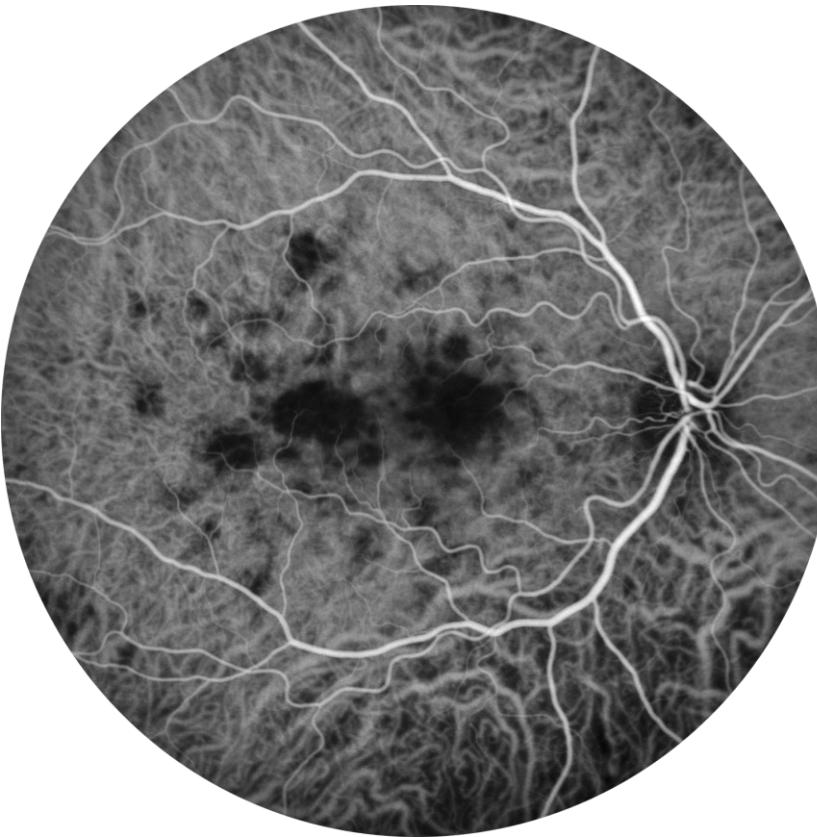


Fluorescein angiography



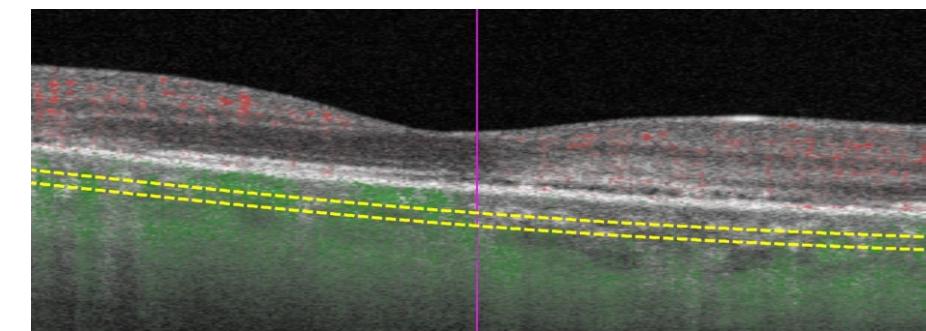
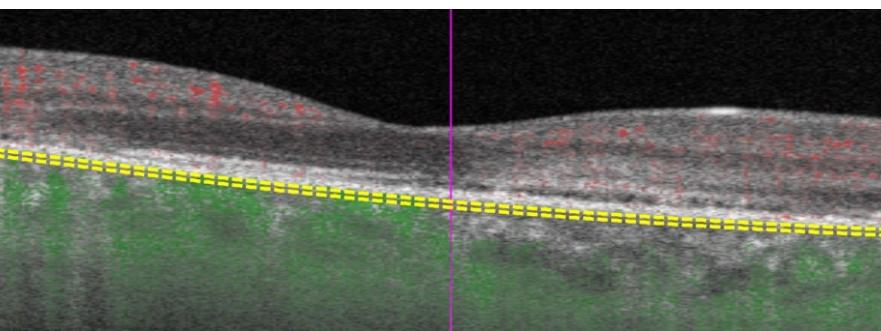
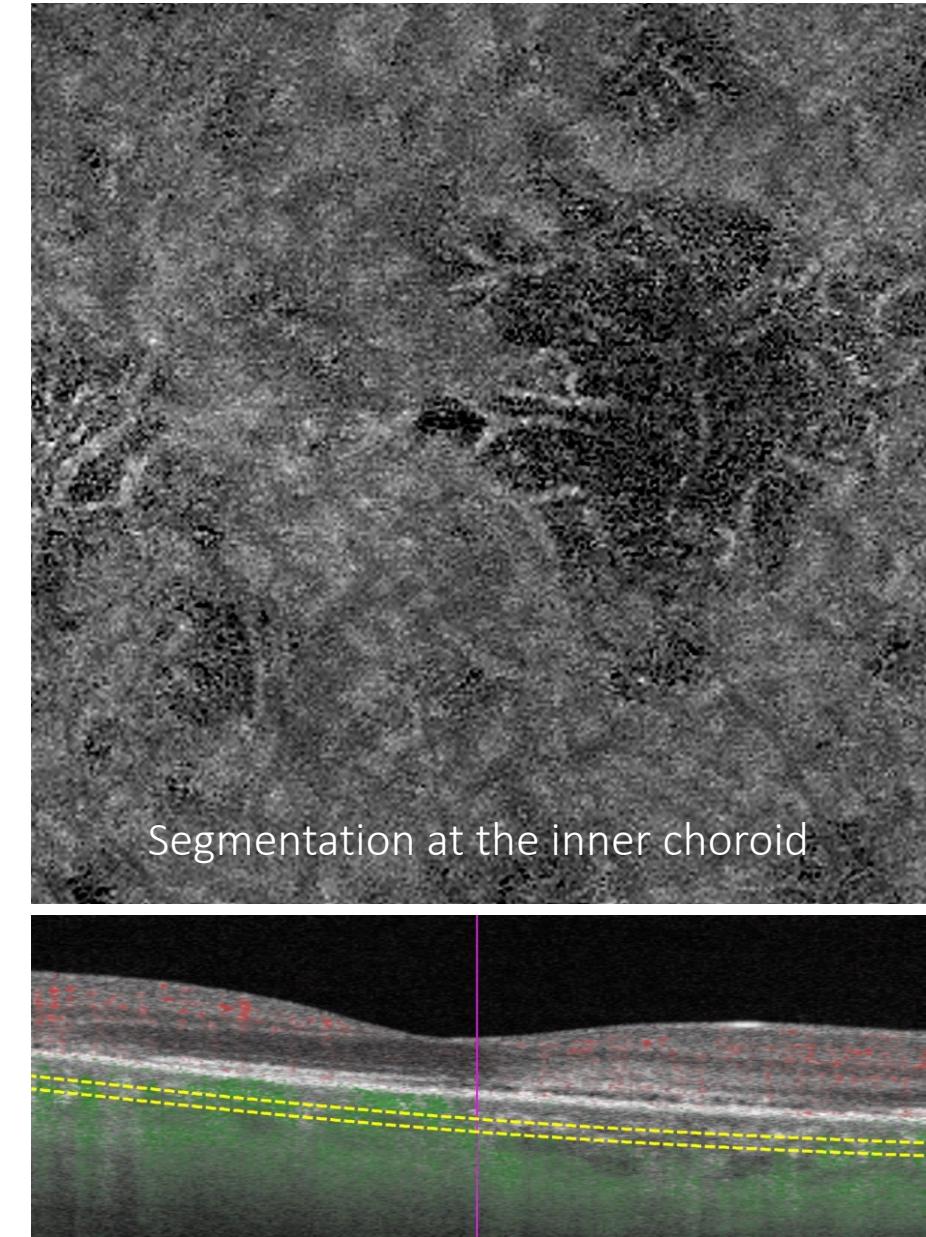
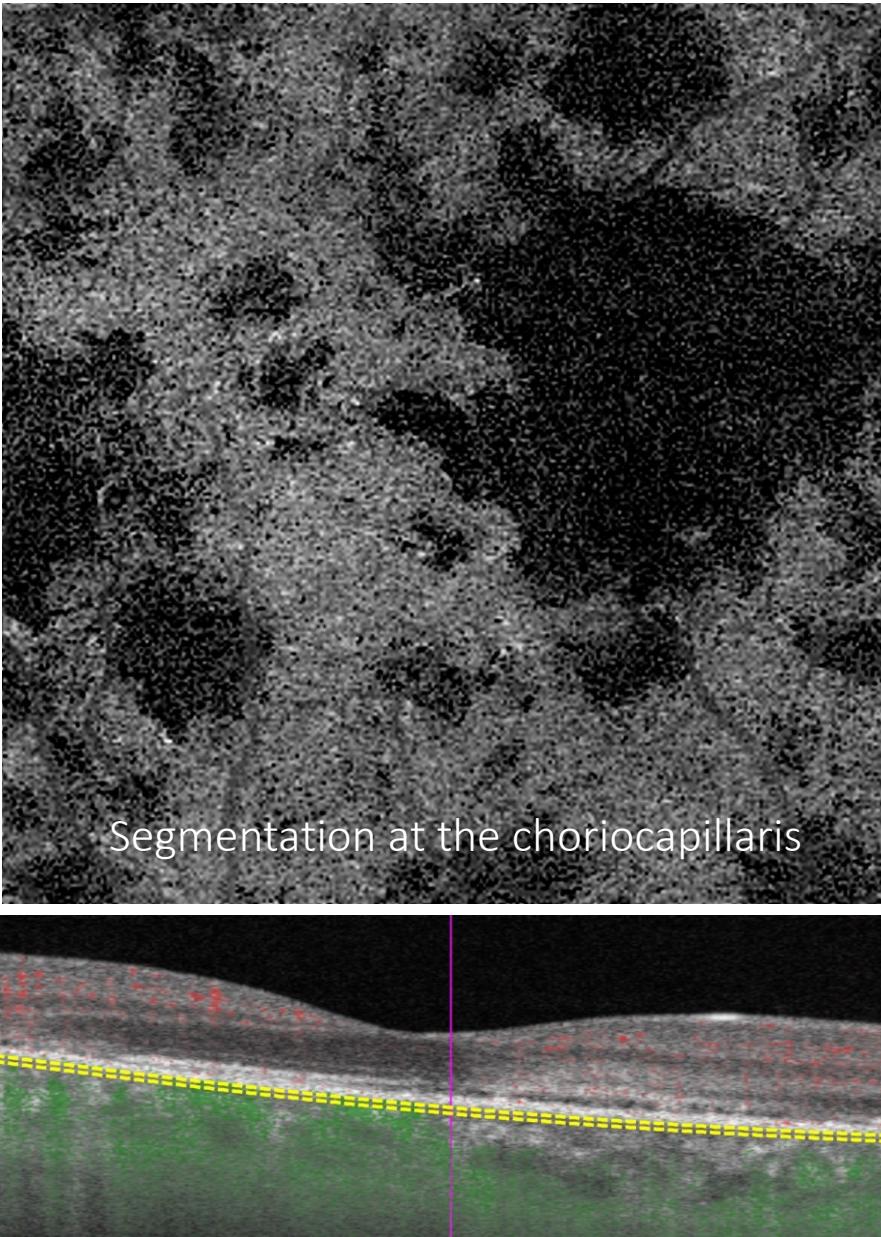
- Only a few hypofluorescent plaques give a late hyperfluorescence
- The visibility of large choroidal vessels through the hypofluorescent plaques , is in favor of hypoperfusion of the inner choroid.

ICG Angiography



- Late plaque hypofluorescence is likely due to RPE dysfunction secondary to choroidal hypoperfusion

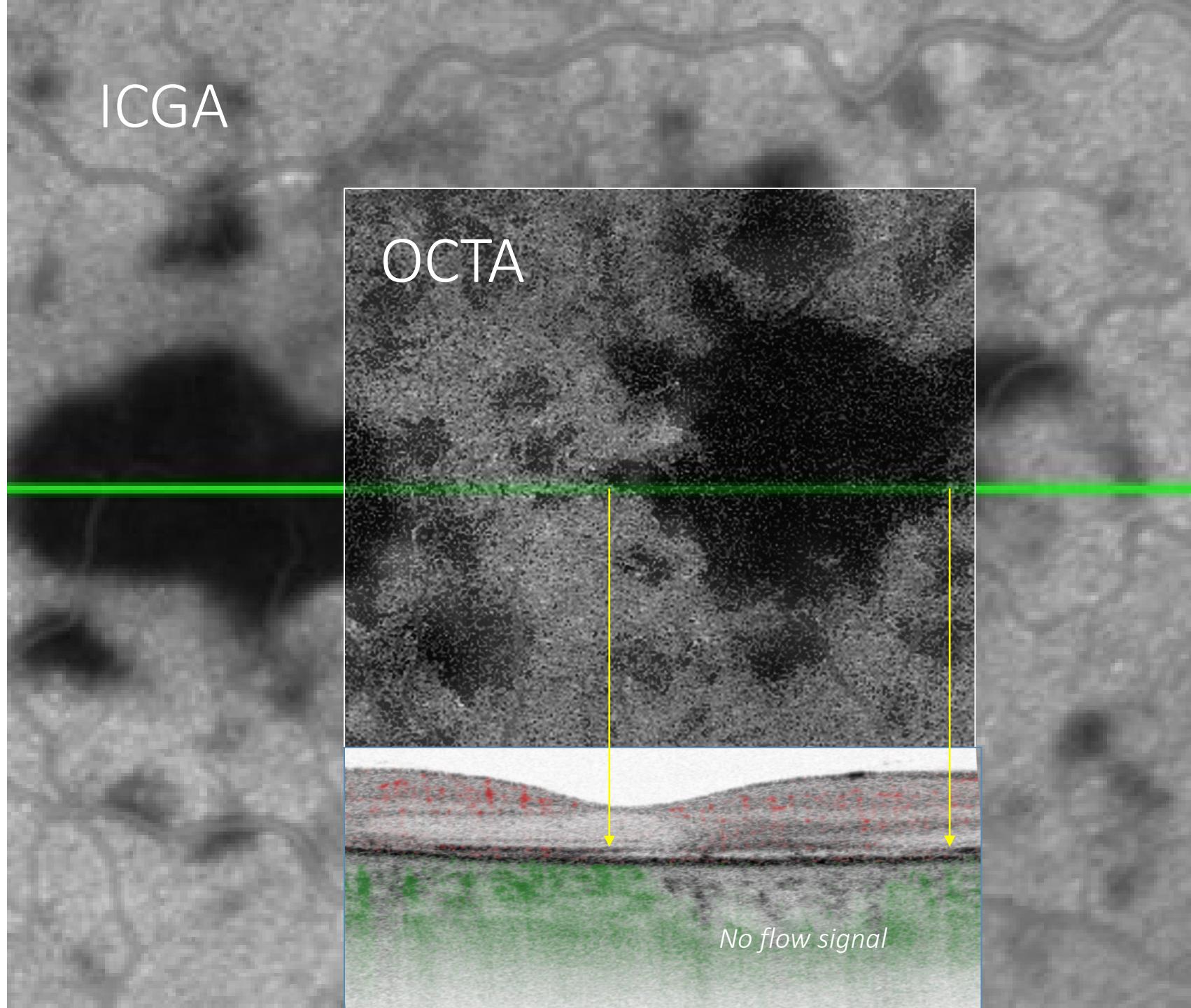
APMPPE OCTA



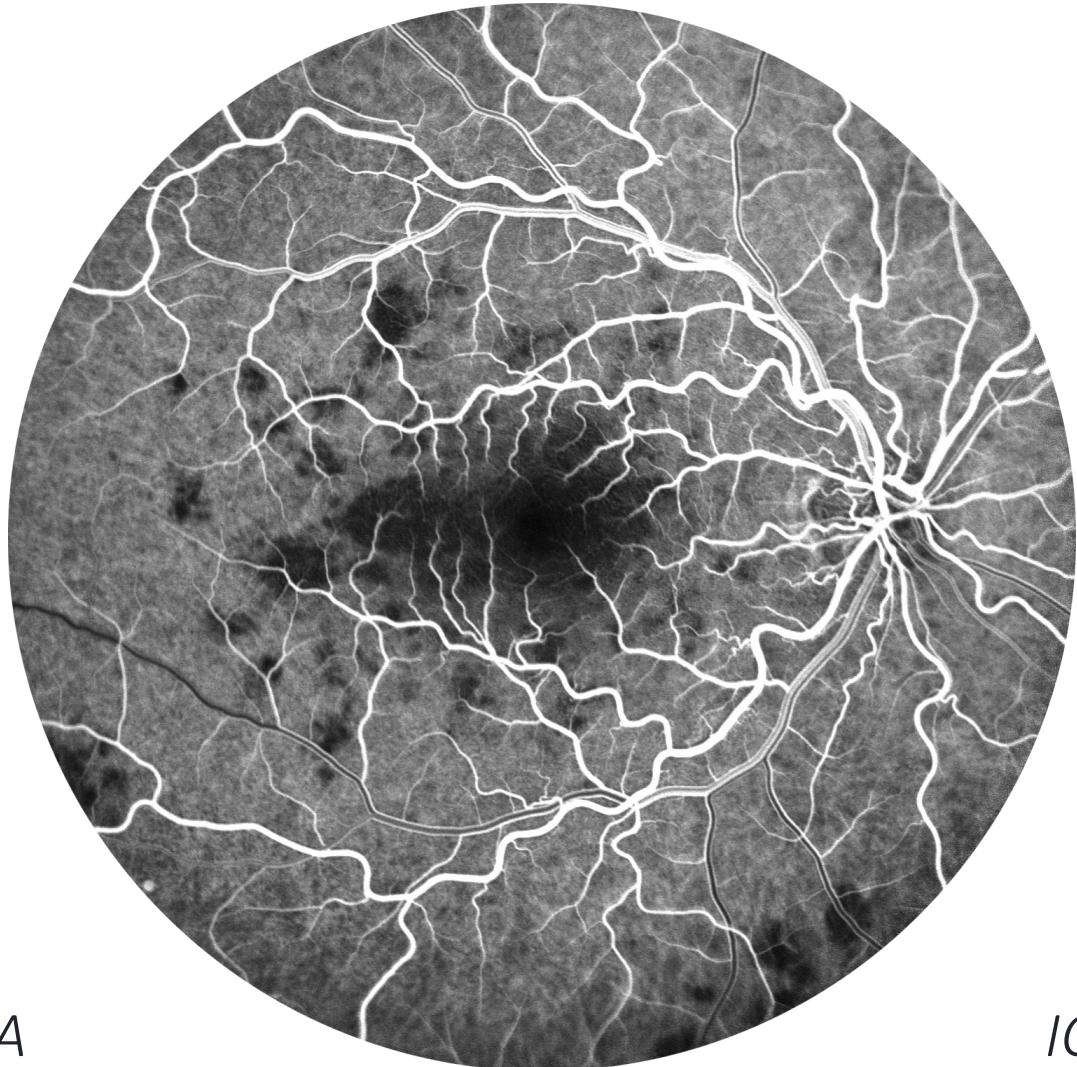
APMPPE

ICGA/OCTA

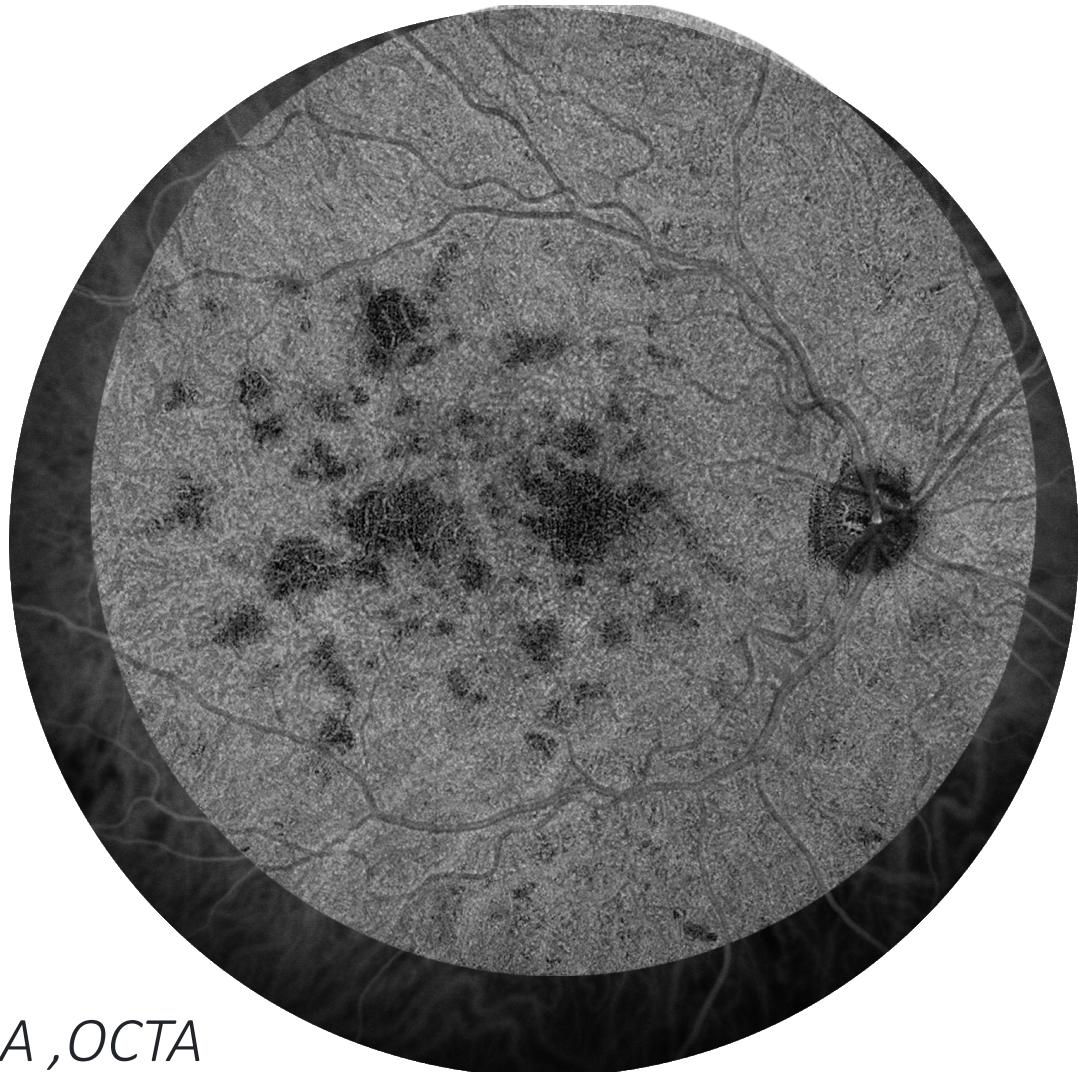
Klufas MA, Phasukkijwatana
N, Iafe NA, Sarraf D et al.
*OCTA Reveals Choriocapillaris
Flow Reduction in Placoid
Chorioretinitis. Ophthalmol
Retin.* 2017;1(1):77-91.



APMPPE : Multimodal imaging



FA



ICGA , OCTA

APMPPE : Choroidal hypoperfusion

- The concept of multifocal choroidal hypoperfusion responsible for mild RPE damage has been illustrated by many authors .

Gaudric A, Coscas G, Bird AC. *Choroidal Ischemia*. Am J Ophthalmol. 1982;94(4):489-498.

Park, D., Schatz, H., McDonald, H. R., & Johnson, R. N. (1995). APMPPE: a theory of pathogenesis. *Retina*, 15(4), 351-352.

Mrejen S, Sarraf D, Chexal S, Wald K, Freund KB. *Choroidal Involvement in APMPPE*. OSLI Retina. 2016;47(1):20-26.

- Recently, it has been proposed to rename this disease Acute Multifocal Choroidopathy

Zhang AY, Han IC, Goldberg MF. *Renaming of APMPPE to Acute Multifocal Placoid Choroidopathy (AMP-C)*. JAMA Ophthalmol. 2017;135(3):185

- However, no consensus has been reached

Jampol LM, Goldstein DA, Fawzi AA. *Keeping the Name of Acute Posterior Multifocal Placoid Pigment Epitheliopathy*. JAMA Ophthalmol.

Multimodal imaging features of APMPPE

Fundus examination	Multiple deep retinal yellow-white spots in the posterior pole and beyond
Fundus Auto Fluorescence	Mild hyper autofluorescence
Fluorescein Angiography	Early hypofluorescence Late hyperfluorescence
ICG Angiography	Early and late hypofluorescence
OCT	EZ Disruption , ONL hyper reflectivity, subretinal space enlargement, choroidal thickening
OCTA	Areas of flow void in the inner choroid corresponding to yellow spots

Adapted from: Testi I, Vermeirsch S, Pavesio C. J Ophthalmic Inflamm Infect. 2021;11(1):31.

APMPPE other ocular findings

- While usually yellow-white spots are the only sign of the disease
 - some cases are associated with other features

Associated features	Nb of publications	
Serous retinal detachment	14	including cases with Harada-like
Retinal vasculitis	5	including cases with CRVO
Scleritis	2	

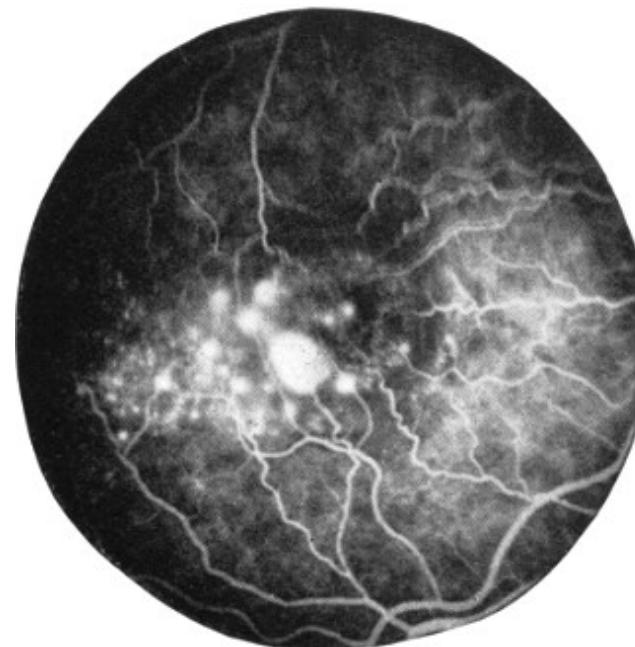
APMPPE and serous macular detachment

- First described on the basis of FA

- Bird et Hamilton 1972
- Young et Bird 1980

- "Central serous detachment of the retina may be an early feature of placoid pigment epitheliopathy"

- "In the acute stage of the disease, reduced blood flow in the choroidal capillaries causes focal swelling of the pigment epithelium due to ischaemia"



Prof Alan Bird

Brit. J. Ophthalm. (1972) 56, 881

Placoid pigment epitheliopathy

Presenting with bilateral serous retinal detachment

A. C. BIRD* AND A. M. HAMILTON†
Moorfields Eye Hospital, City Road, London, E.C.1

Gass (1968) described a syndrome affecting adults which he termed "acute posterior multifocal placoid pigment epitheliopathy". The patients present with bilateral visual loss and the condition is characterized by the presence at the posterior pole of multiple non-elevated grey-white lesions at the level of the pigment epithelium. Fluorescein angiography shows that these small lesions occlude the choroidal fluorescence during initial transit of dye, and become hyperfluorescent during subsequent minutes. The condition resolves spontaneously within a few weeks and visual recovery is usually good though it may be incomplete. After recovery scattered areas of depigmentation with pigment clumping remain.

In this paper two patients with features of acute posterior multifocal placoid pigment epitheliopathy are described, both of whom presented with detachment of the posterior retina.

Case reports

Case 1, a 28-year-old female student, presented with progressive blurring of vision of both eyes and micropsia for 5 days.

Her finger had become infected after mild trauma 3 weeks before and she had received an intramuscular injection of penicillin followed by a 5-day oral course. She had also been given a single injection of tetanus toxoid. She was otherwise well.

Examination

On admission, the visual acuity in the right eye was reduced to finger counting at 1 m. and in the left to 6/60. No cells were seen in the aqueous humour or vitreous body. There were two small serous detachments of the retina at the right posterior pole associated with multiple pale discrete lesions at the level of the pigment epithelium. The fundus was otherwise normal. Identical changes were seen in the left eye.

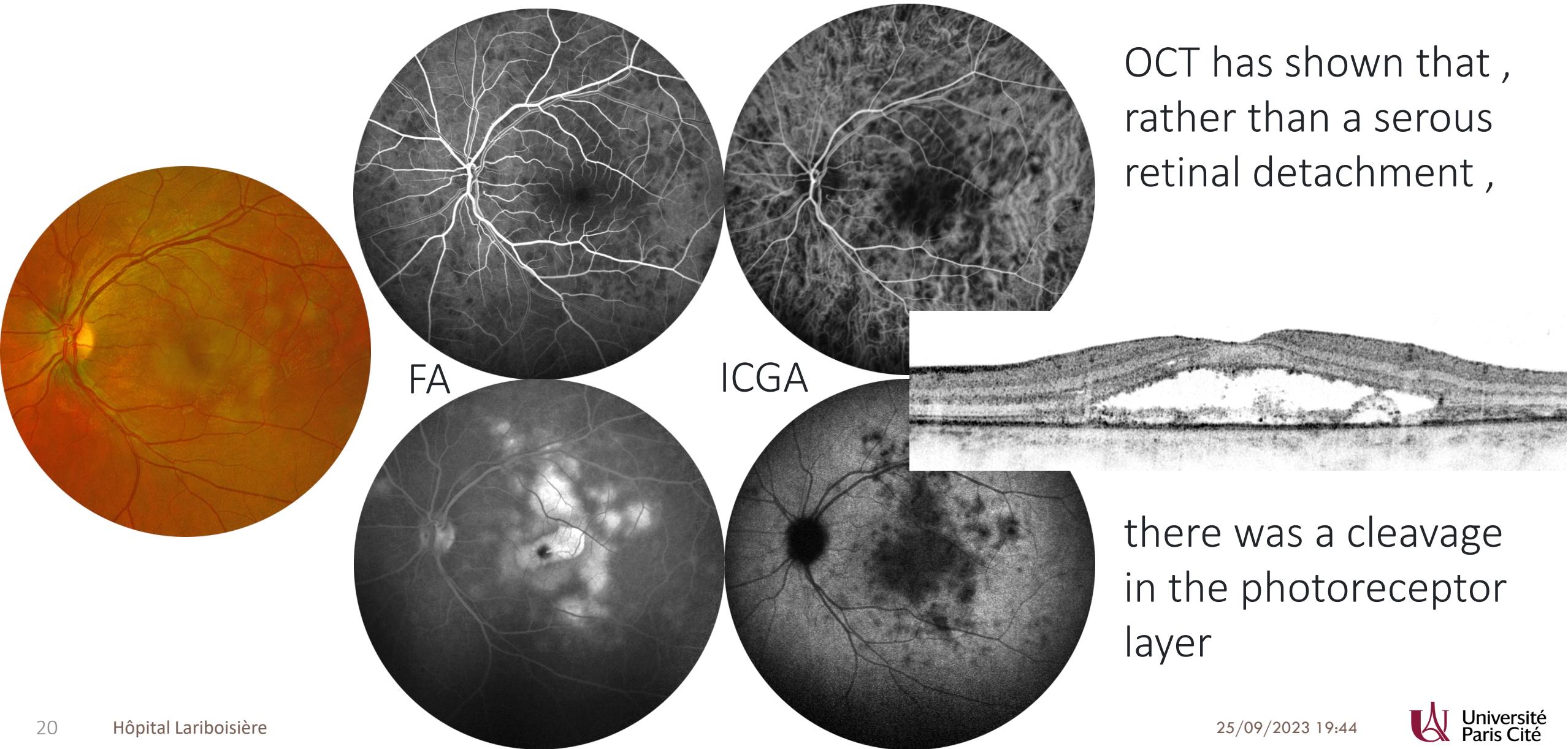
Angiography

Fluorescein angiography was performed on admission. During the initial transit of dye there were multiple discrete areas in which the background fluorescence was occluded. During the following minute these areas became hyperfluorescent (Fig. 1a), and within 5 minutes of dye injection the serous detachments were outlined by dye in the subretinal space (Fig. 1b). Identical changes occurred in the left eye (Fig. 1c).

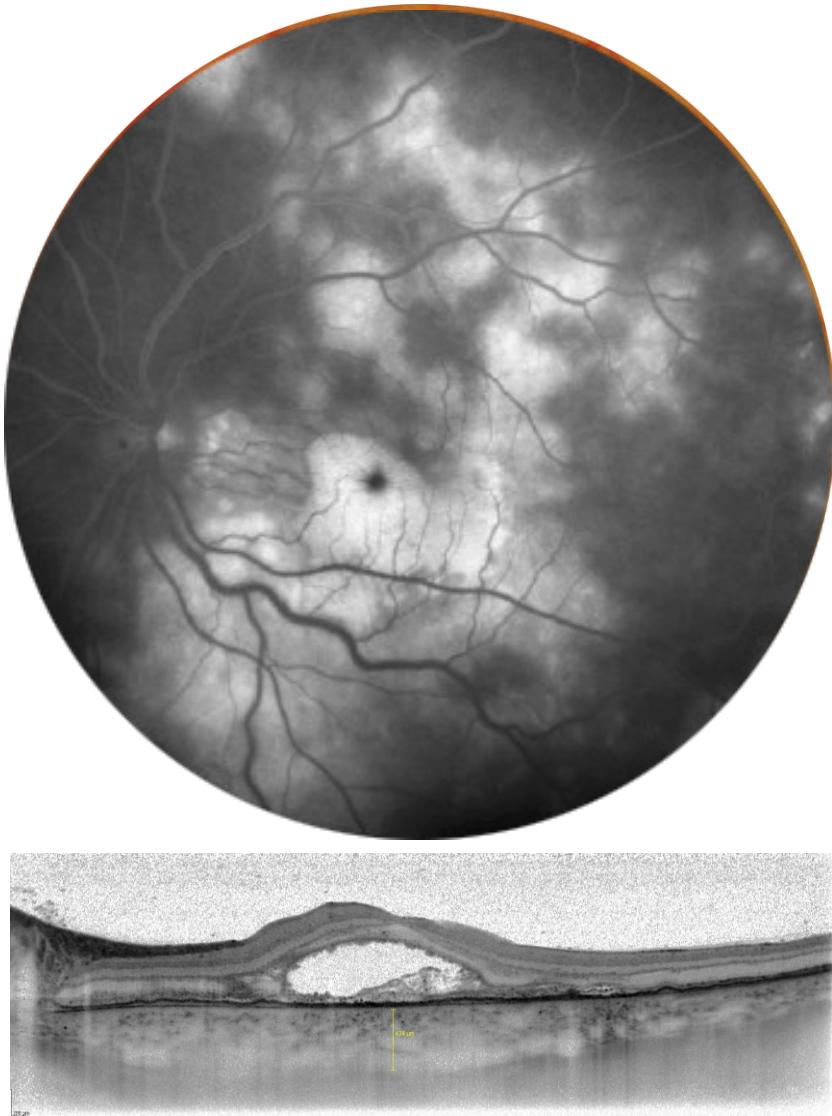
Laboratory investigations

The following investigations were performed and the results were normal: haemoglobin, white cell count, erythrocyte sedimentation rate, serum proteins and electrophoresis, immunoglobulins (IgG, IgA, IgE, and IgM), Paul-Bunnell (sheep's red cells), and standard serological tests for syphilis.

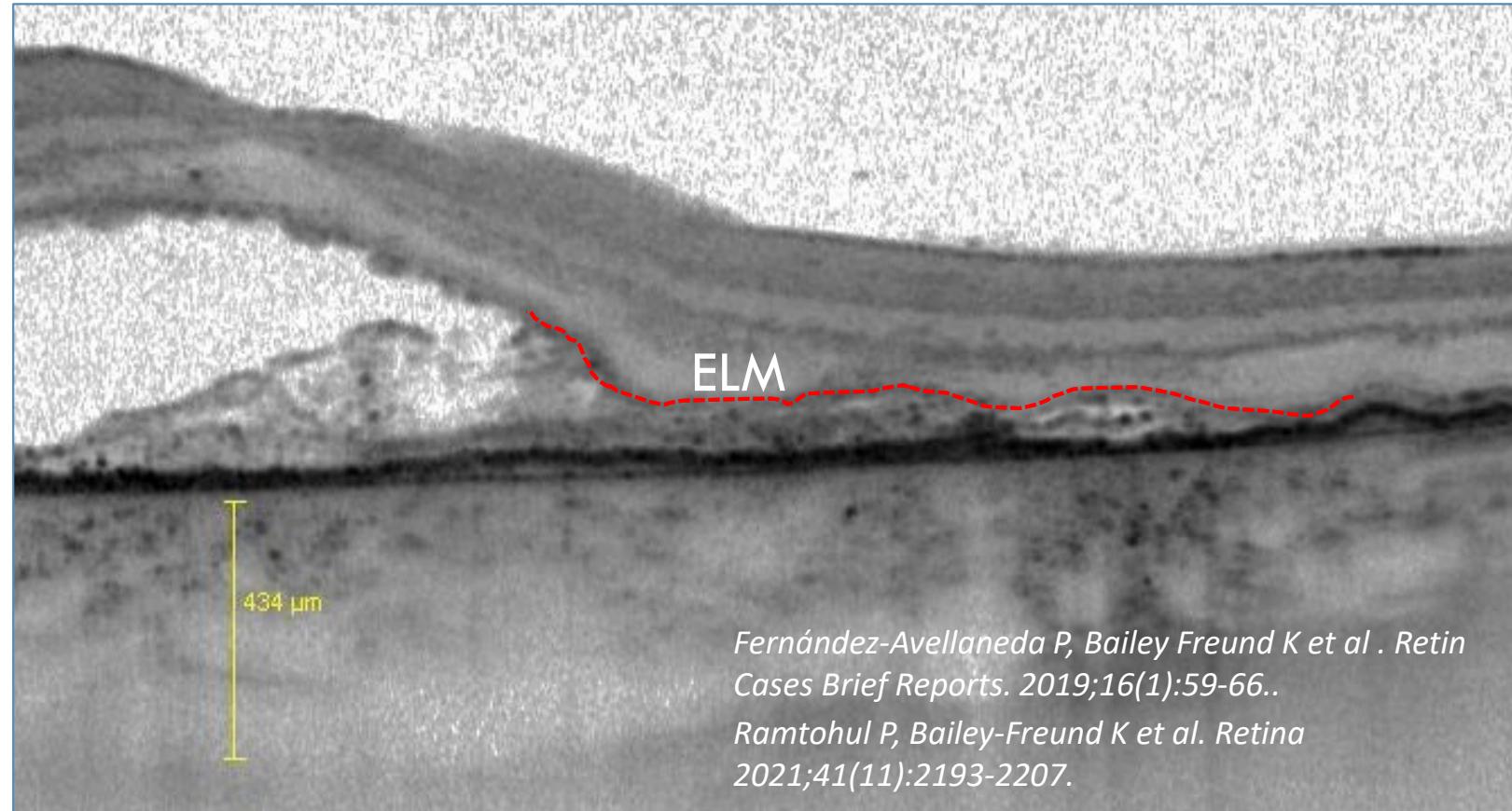
APMPPE and serous macular detachment



APMPPE and serous macular detachment



- This cleavage has been termed "*Bacillary layer detachment*" in reference to a patho-anatomic vocabulary



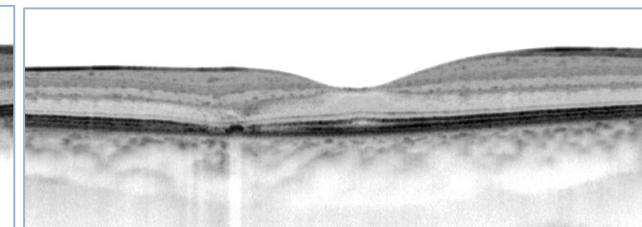
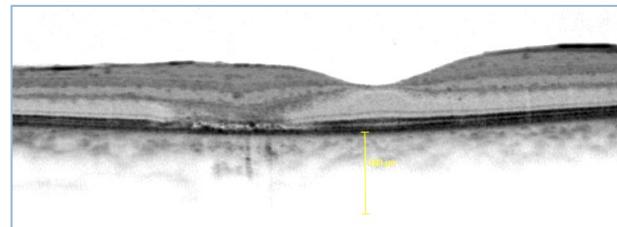
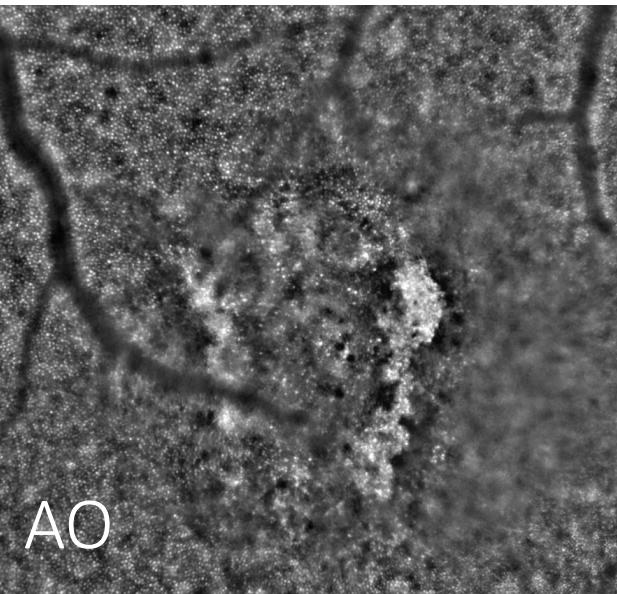
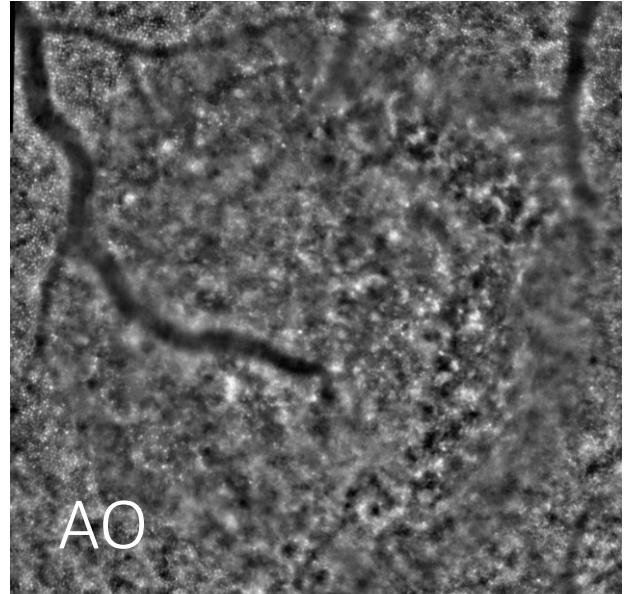
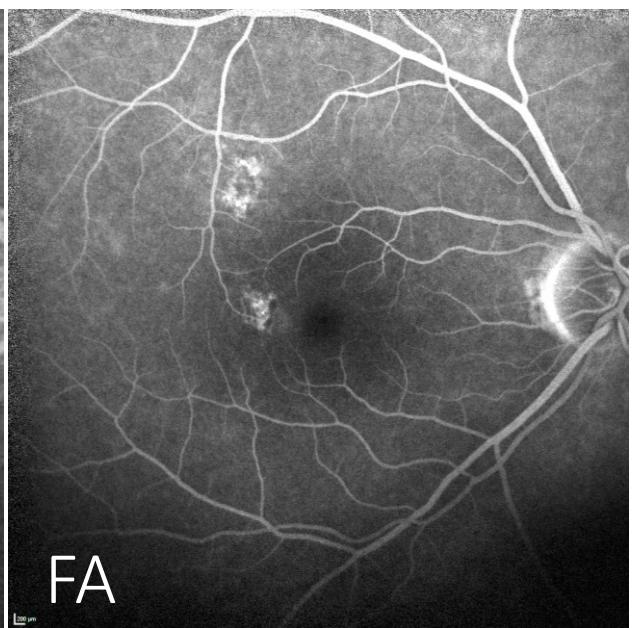
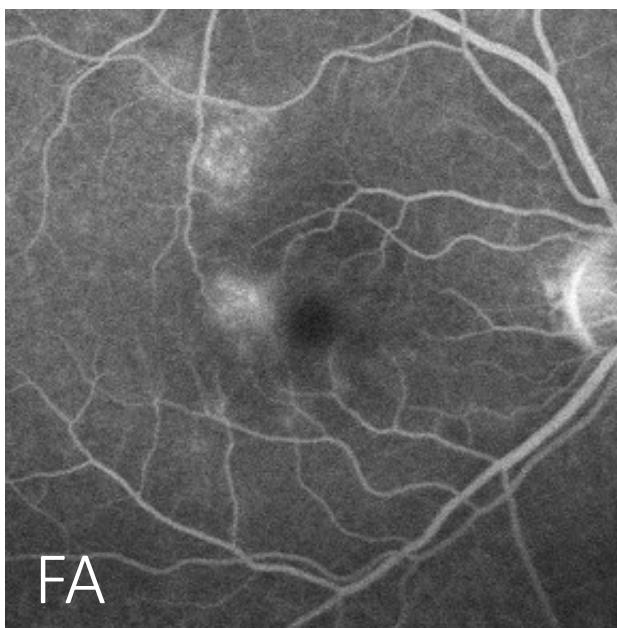
APMPPE Spontaneous evolution

- In most cases the yellow spots resolve within 2 or 3 weeks
 - On OCT, photoreceptors recovery may take 2 to 4 months and may be incomplete as well as RPE proliferation and irregularities
- Visual outcome depends on the initial foveal involvement
 - The presence of a serous macular detachment is not always a poor prognosis
 - The occurrence of RPE scars in the fovea limits visual recovery

Scarinci F, Fawzi AA, Shaarawy A, Simonett JM, Jampol LM. Longitudinal Quantitative Evaluation of Outer Retinal Lesions in APMPPE using OCT. *Retina*. 2017;37(5):851-857.

Fiore T, Iaccheri B, Androudi S, et al. Acute posterior multifocal placoid pigment epitheliopathy: outcome and visual prognosis. *Retina*. 2009;29(7):994-1001.

APMPPE Spontaneous evolution

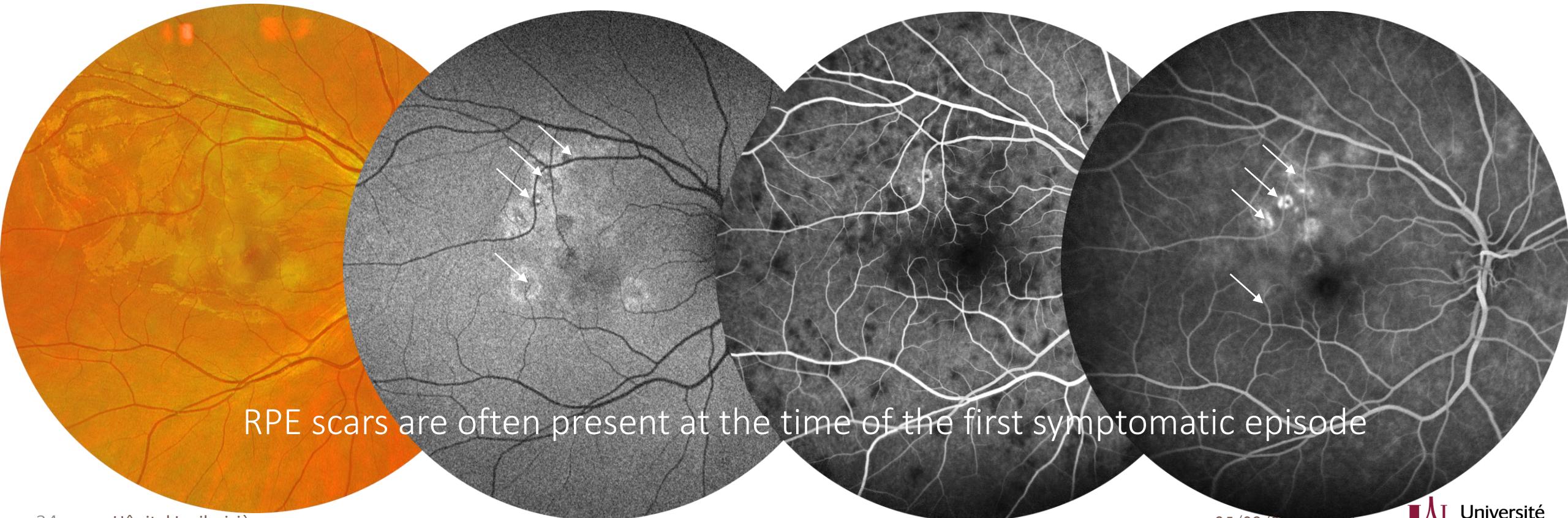


RPE scar smaller than initial lesion
Incomplete PR restoration on AO

Mrejen S, Freund KB. APMPPE as a Choroidopathy: What we learned from AO Imaging. JAMA Oph 2013;131(10)

APMPPE recurrences

- Although the original description categorized APMPPE as a self-limited condition with a good prognosis,
 - the disease can recur and result in significant visual loss

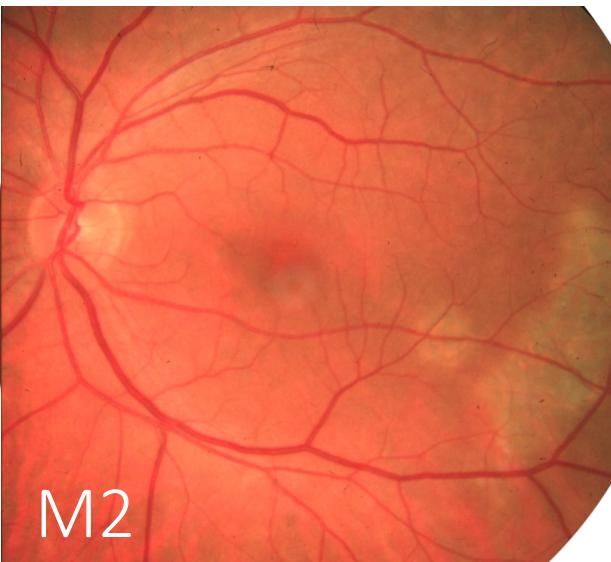


Recurrent APMPPE

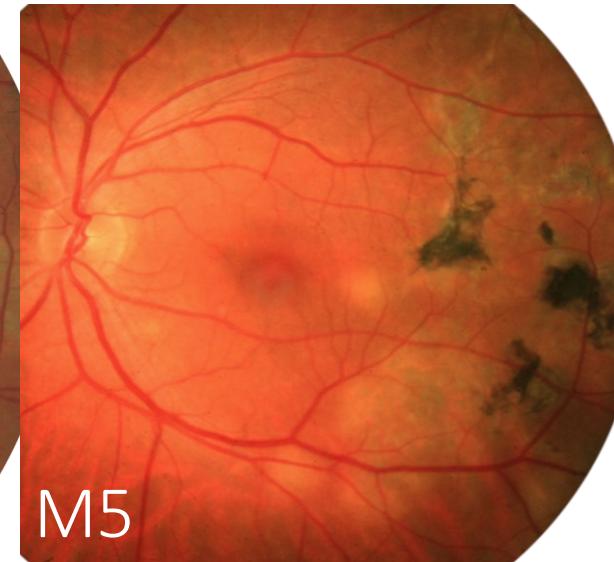
- New plaques may occur by contiguity with previous scars or elsewhere



M0



M2



M5



M7

RECURRENCES OF ACUTE POSTERIOR MULTIFOCAL PLACOID PIGMENT EPITHELIOPATHY

A. L. LYNESS, F.R.C.S., AND A. C. BIRD, F.R.C.S.
London, England

Am J Ophthalmol. 1984;98(2):203-207.

CLINICAL SCIENCES

Relentless Placoid Chorioretinitis

A New Entity or an Unusual Variant of Serpiginous Chorioretinitis?

B. Eric Jones, MD; Lee M. Jampol, MD; Lawrence A. Yannuzzi, MD; Michael Tittl, MD;
Mark W. Johnson, MD; Dennis P. Han, MD; Janet L. Davis, MD; David F. Williams, MD

Arch Ophthalmol. 2000;118(7):931-938.

APMPPE differential diagnosis

- Multiple placoid lesions
 - raise the differential diagnosis of all other types of white spots
- Cases of recurrence by contiguity
 - raise the differential diagnosis of Serpiginous choroiditis
- Cases of macular serous detachment
 - raise the differential diagnosis of VKH disease

APMPPE systemic association

- APMPPE is usually an isolated disease.
 - It can rarely occur in a systemic context

Group of diseases	Nb of publications	Entities
Thyroiditis	4	
Cerebral vasculitis	33	Stroke, Meningo-encephalitis sometimes fatal
Drug toxicity	3	Lamotrigine, Alemtuzumab, Ibuprofen
Systemic diseases	8	Juvenile rheumatoid arthritis, Erythema nodosum, Wegener's granulomatosis, Ulcerative colitis, Systemic necrotizing vasculitis, hemophagocytic syndrome, Mediterranean fever
Tuberculosis	2	
Viral and bacterial infection	12	Borreliosis, Adenovirus, Mumps, Dengue fever, Coxsackie, Covid 19, Lyme disease.
Vaccination	5	Influenza, Varicella, Meningococcal infection, Hepatitis B

APMPPE treatment

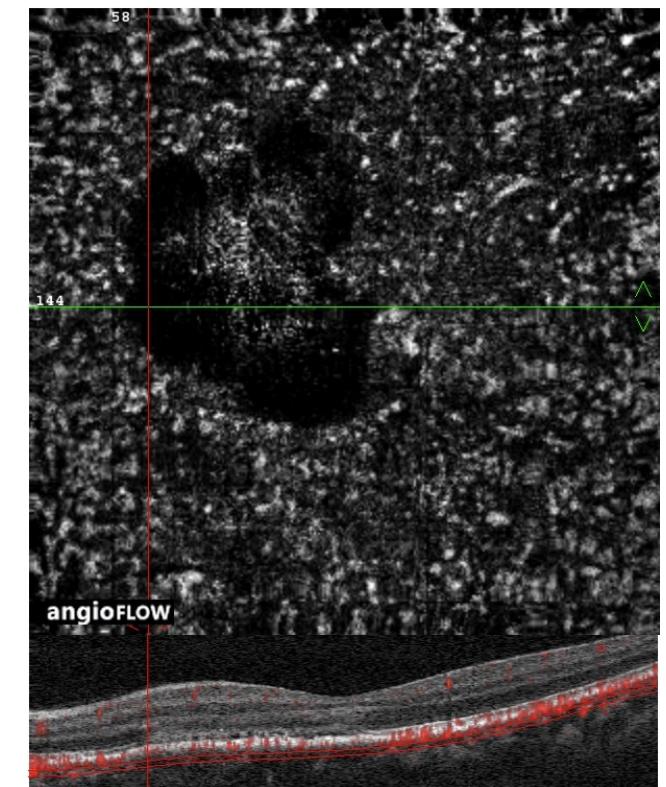
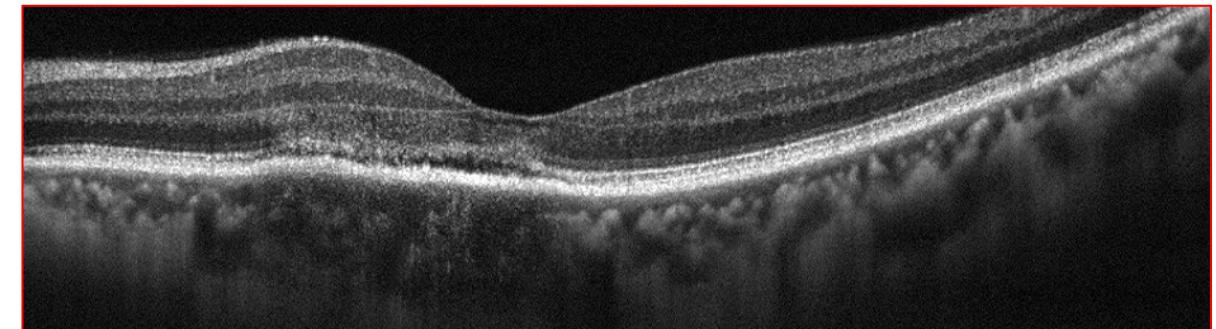
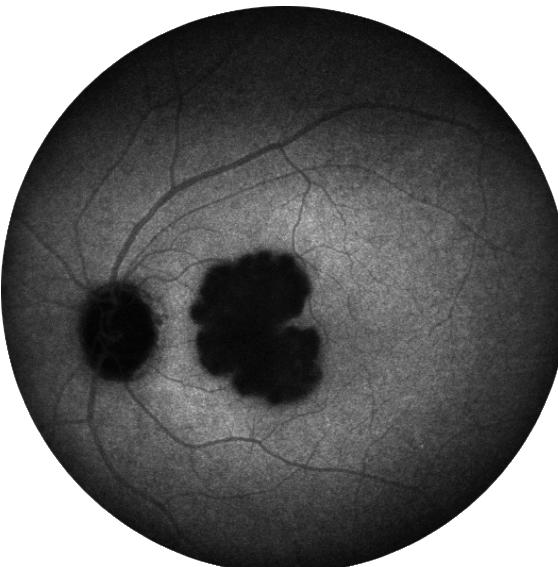
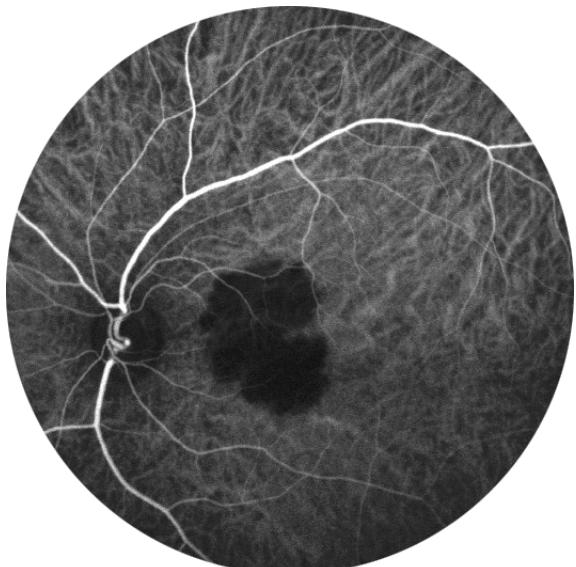
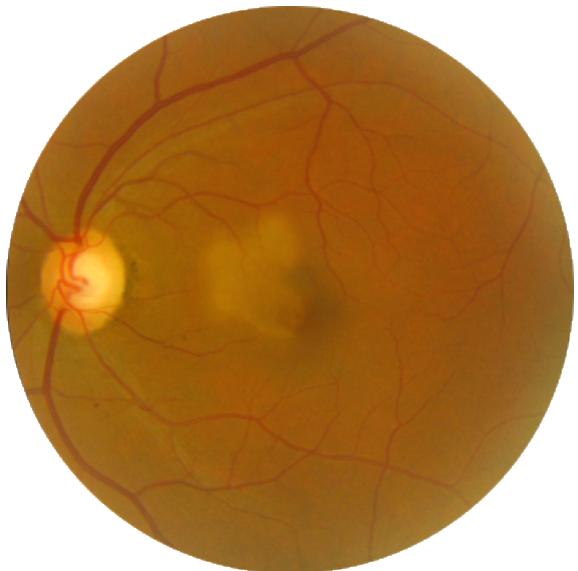
- Treatment is not well codified
- In case of moderate vision loss and sparing of the foveal center
 - there is no evidence that a treatment is useful
- In case of significant serous macular detachment or cleavage, or large macular plaque
 - treatment with high dose, short-term systemic steroids is usually recommended
- In case of recurrent disease, the introduction of anti-metabolites may be necessary

Testi I, Vermeirsch S, Pavesio C. Acute posterior multifocal placoid pigment epitheliopathy J Ophthalmic Inflamm Infect. 2021;11(1):31.

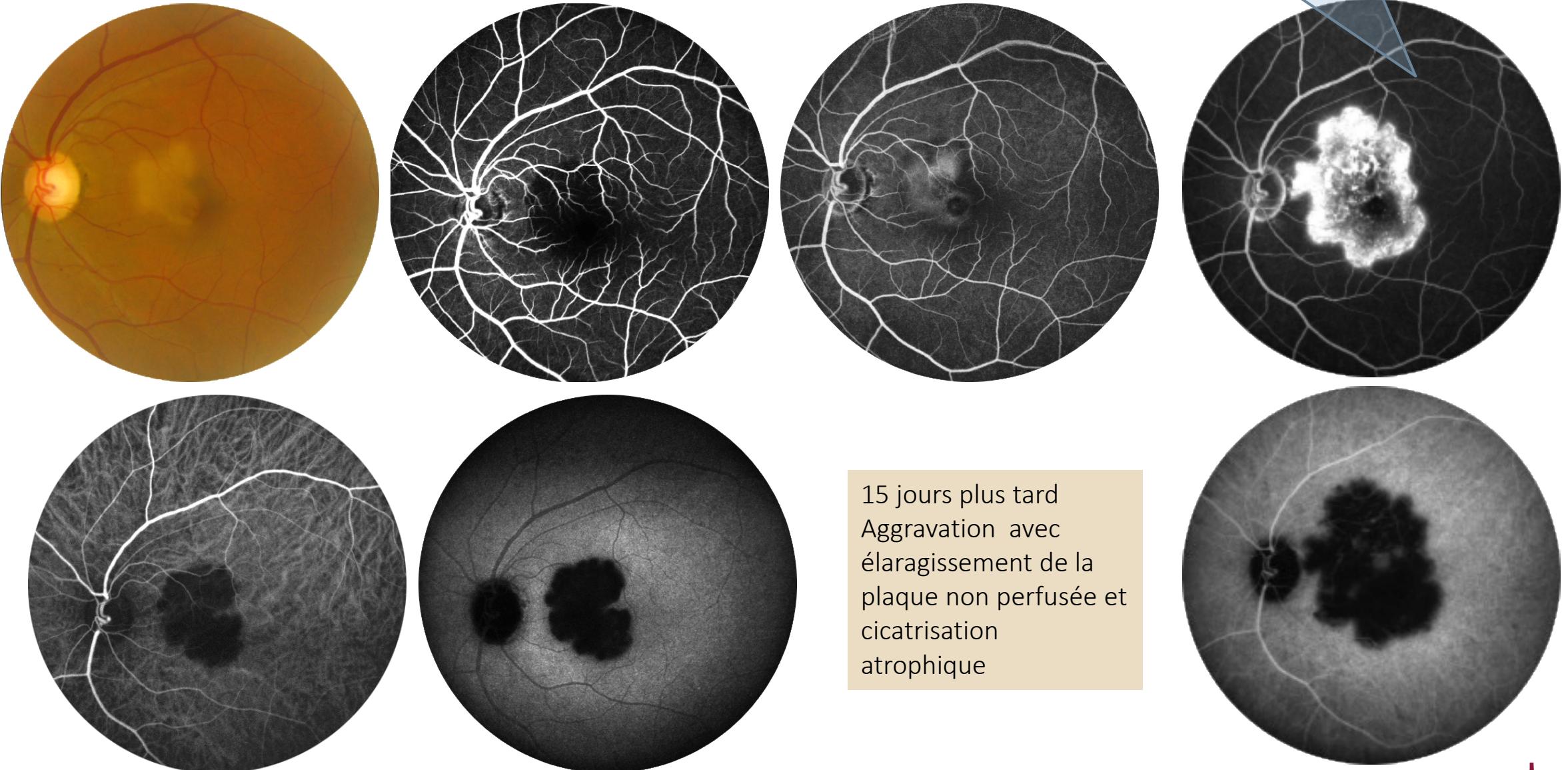
APMPPE, *take-home message*

- APMPPE is a rare inflammatory eye disease, affecting the inner choroid and the outer retina.
 - it occurs in young adults, equally in men and women
- APMPPE is most often isolated but can occur in an ocular inflammatory context or may be associated with a systemic infectious , inflammatory or immune context.
- APMPPE is most often a self-limited disease with few recurrences
- Multimodal fundus imaging can easily differentiate APMPPE from other White Spots of the fundus

EEP plaque maculaire



EEP plaque maculaire

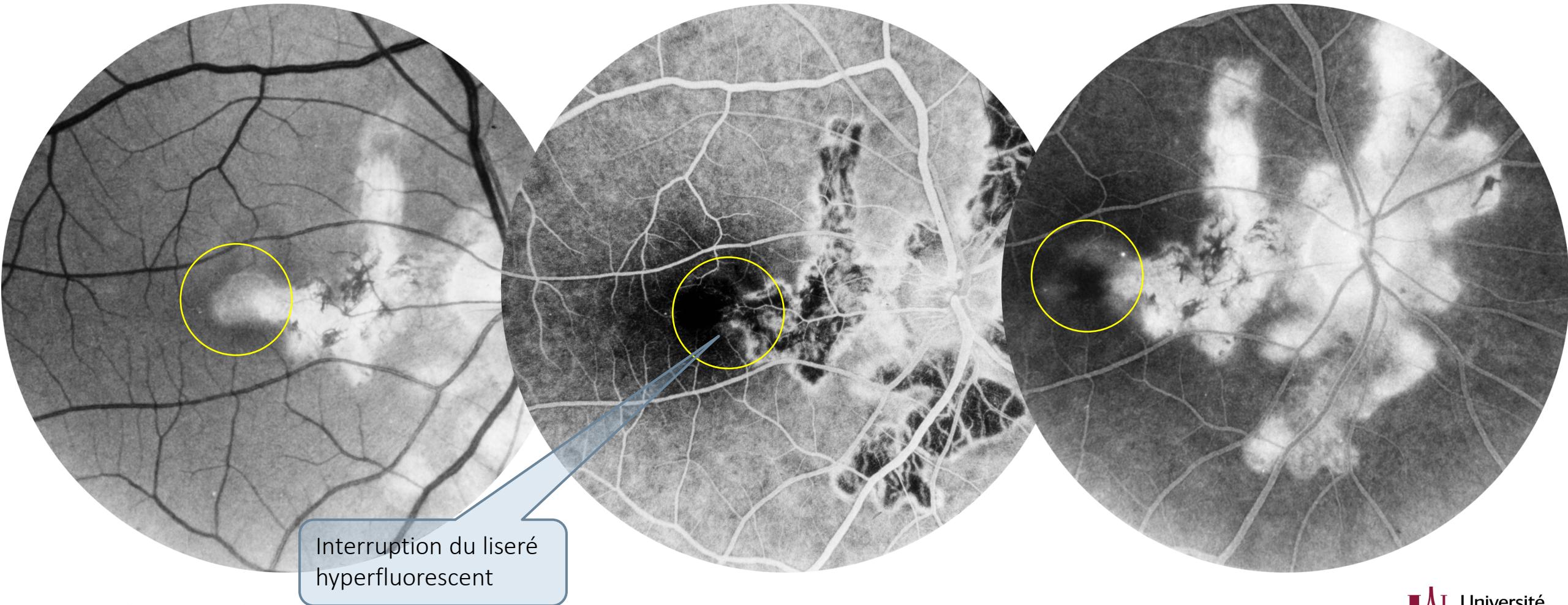


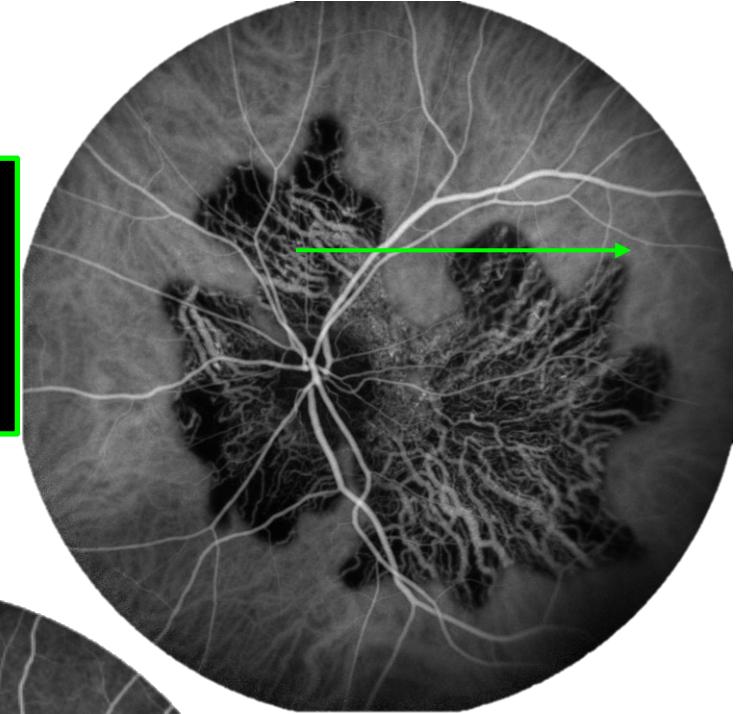
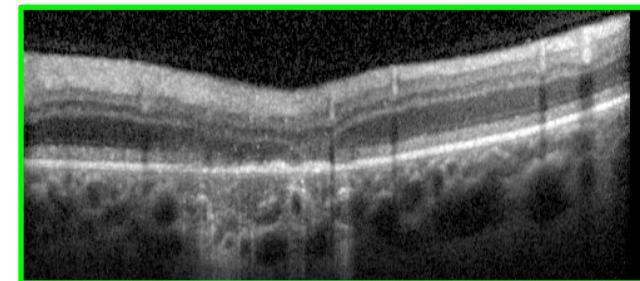
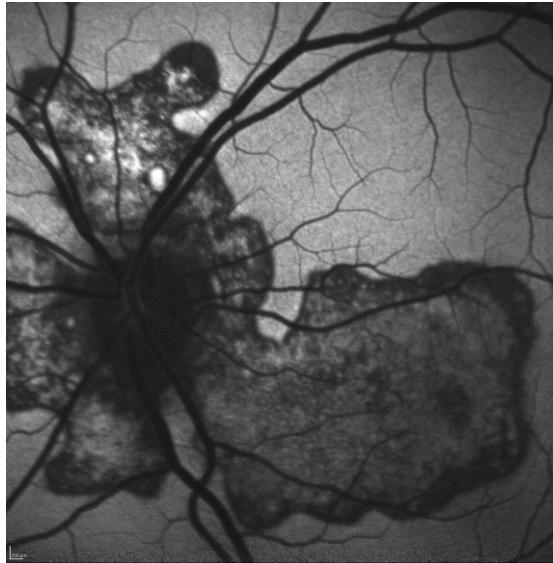
Choroïdite Serpigineuse

- Aussi connue sous
 - Geographic helicoid peripapillary choroidopathy
 - Choroïdite Géographique
- Décrise par
 - Franceschetti 1962, Hyvärinen 1969
 - Hamilton et Bird 1974
- Caractéristiques
 - Adultes 30 à 60 ans
 - Mêmes plaques que EEP
 - Mais
 - Début juxta papillaire
 - Extension par contiguïté, en travées
 - Cicatrices atrophiques destructrices
 - Récidives imprévisibles
- Signes oculaires associés
 - Vasculites
 - Décollement rétinien exsudatif
 - Néovascularisation choroïdienne juxta-papillaire
 - NVC maculaires

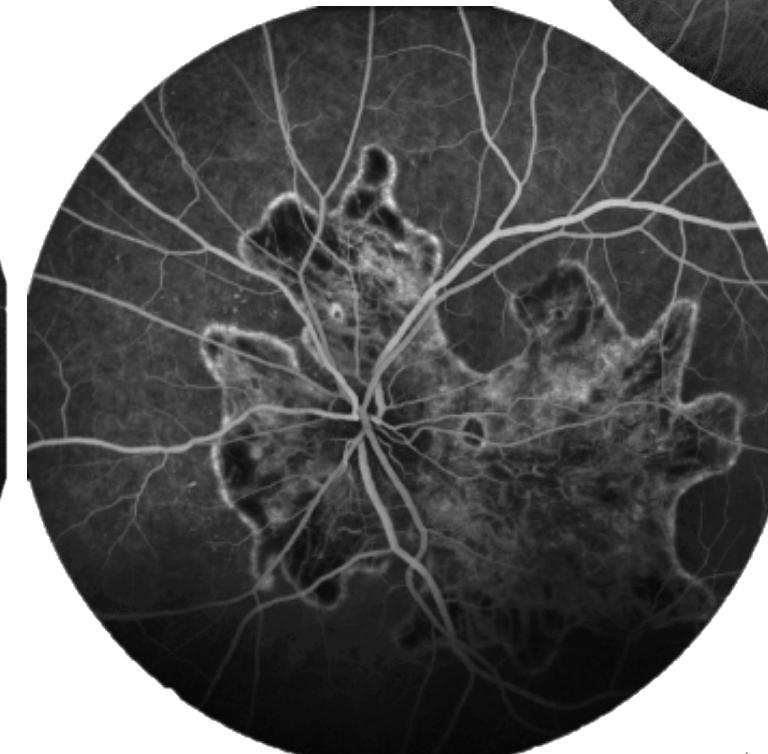
Choroïdite serpigineuse

- Nouvelle poussée sur cicatrice péripapillaire



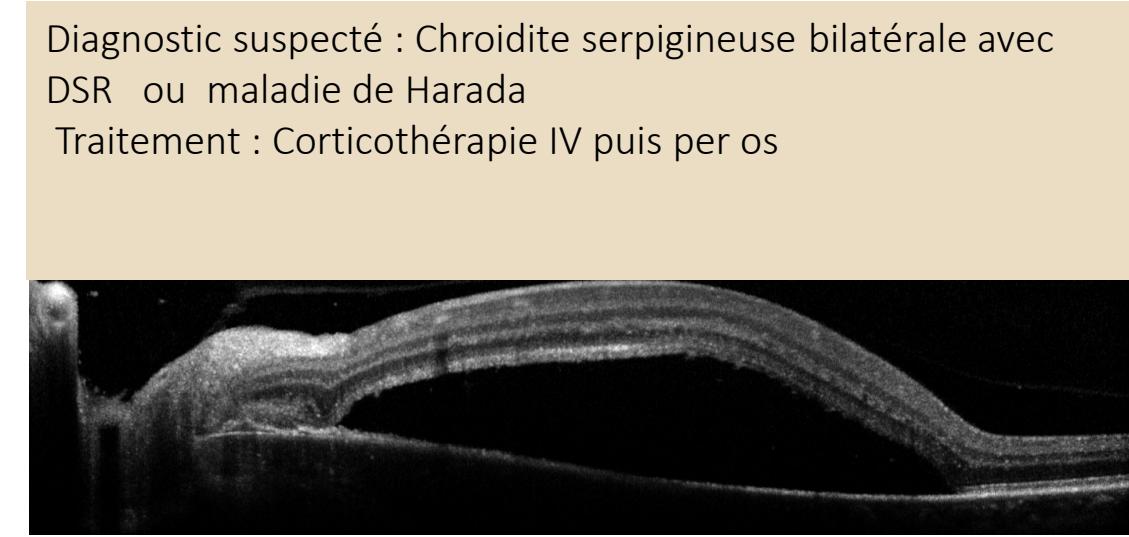
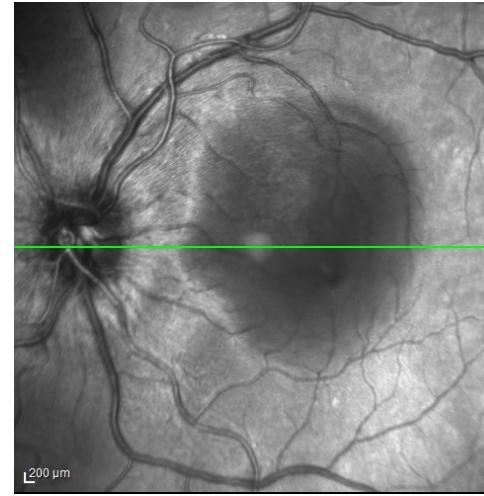


■ évolution vers
l'extension
d'une
choroidite
serpigineuse

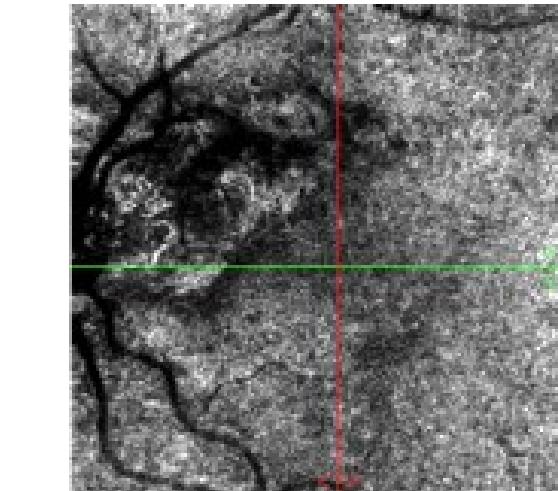
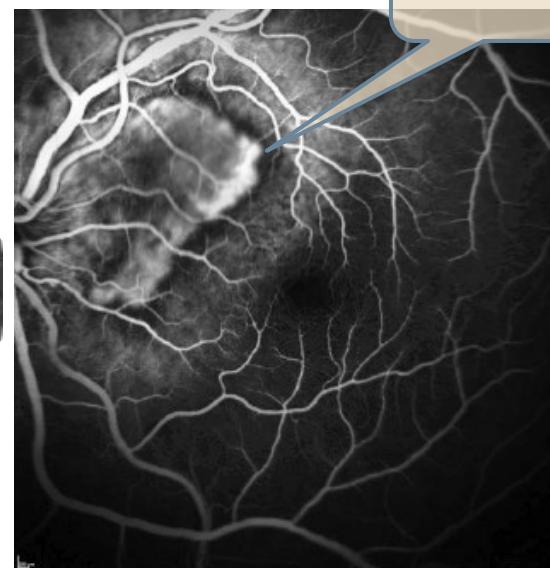
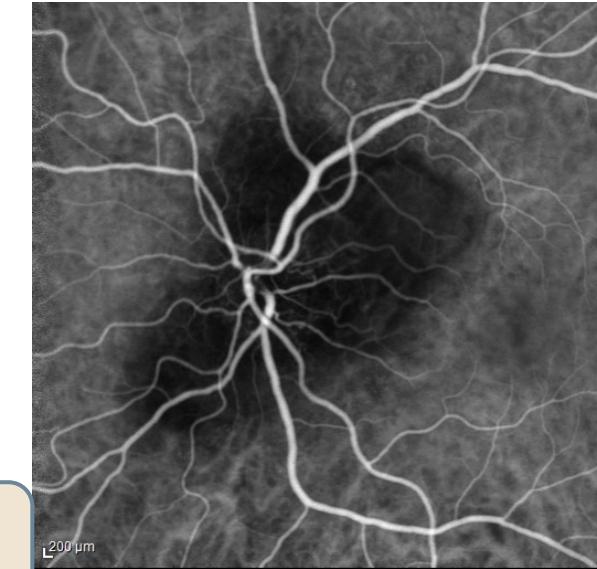
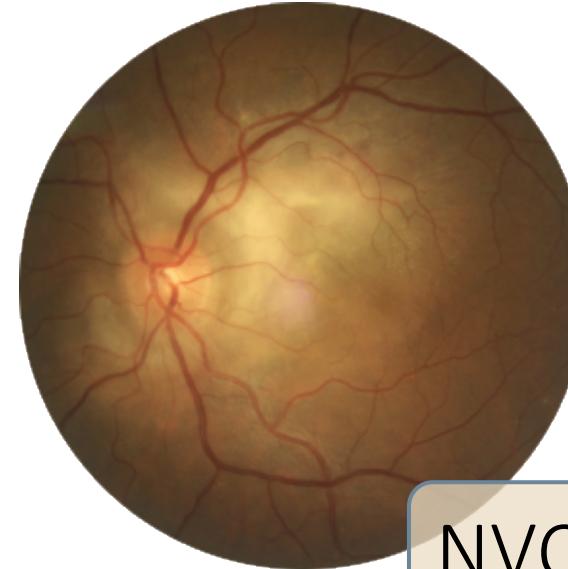
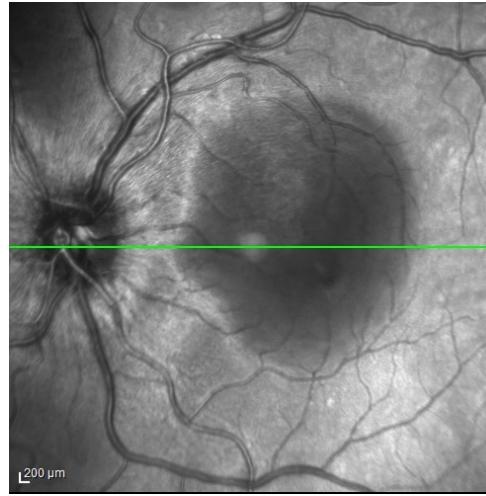
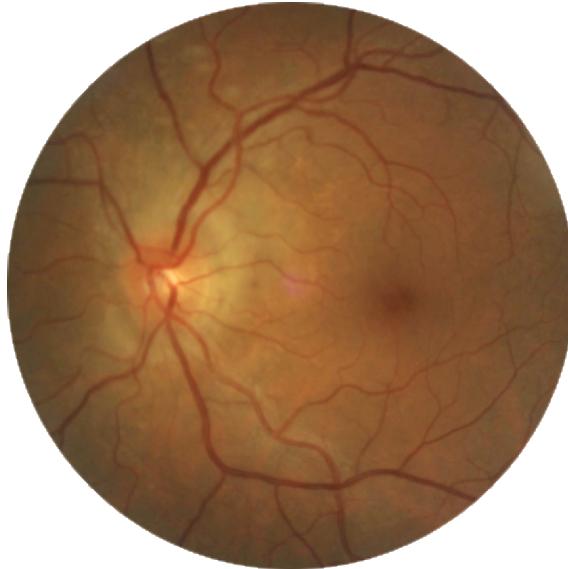


Cas du Dr R. Ores XV-XX

Choroïdite serpigineuse, évolution



6 mois plus tard , à la baisse des corticoides à 15 mg : nouvelle baisse d'AV OG



EEP/Choroidite serpigineuse

Formes frontières

- EEP récidivante
 - Lyness et Bird 1984
- Choroïdite serpigineuse à début maculaire
 - Hardy et Schatz 1987
- Relentless Placoid Choroiditis
 - Jones, Jampol, Yannuzzi 2000
- Ou, Ampiginous Choroiditis
- même aspect final : "CHOROIDITE GÉOGRAPHIQUE"

RECURRENTS OF ACUTE POSTERIOR MULTIFOCAL PLACOID PIGMENT EPITHELIOPATHY

A. L. LYNESS, F.R.C.S., AND A. C. BIRD, F.R.C.S.
London, England

Acute posterior multifocal placoid pigment epitheliopathy recurred in seven patients (all men, ranging in age from 25 to 43 years). In all seven cases swelling of the pigment epithelium resolved rapidly but left a permanent pigmentary disturbance. Loss of choriocapillaris occurred in six cases. Three patients had severe unilateral visual loss. Three patients had used antimicrobial drugs (two of them repeatedly), suggesting that in some cases this condition may be a manifestation of a hypersensitivity reaction to the antimicrobial agent.

Gass¹ described a syndrome affecting young adults which he termed acute posterior multifocal placoid pigment epitheliopathy. Bilateral visual loss is associated with multifocal, yellow-white lesions at the level of the pigment epithelium of the posterior pole. The condition resolves spontaneously and is accompanied by marked visual improvement, despite prominent and permanent changes of the pigment epithelium.

Since this initial description, many associated ocular and systemic abnormalities have been described, including uveitis,^{2,8} vasculitis,^{3,9} papillitis,^{4,9} episcleritis,^{3,6} cerebral vasculitis,^{7,10} and erythema nodosum.^{2,5,8} Variations in the ocular pattern have been described. Non-simultaneous lesions often occur as the condition evolves over several weeks. Unilateral cases have been observed,^{3,5,11} although in such eyes evidence of disturbed choroidal perfusion may be found in the apparently normal eye.¹² Gass⁵ and

Young, Bird, and Sehmi¹² described large single lesions with evidence of abnormal choroidal perfusion in areas of apparently normal retina and Deutman and associates⁸ reported loss of choriocapillaris in association with the pigmentary disturbance. Acute posterior multifocal placoid pigment epitheliopathy is generally considered a nonrecurrent disease, although recurrences have been described.^{5,9,13,14}

The visual prognosis is usually good; Lewis and Martonyi,¹⁴ in a review of early reported cases, said that more than 80% of affected eyes recovered a visual acuity of 20/40 or better; Gass,⁵ in a series of 30 patients followed up for at least one year, found that only two of 59 eyes failed to obtain a visual acuity better than 20/30.

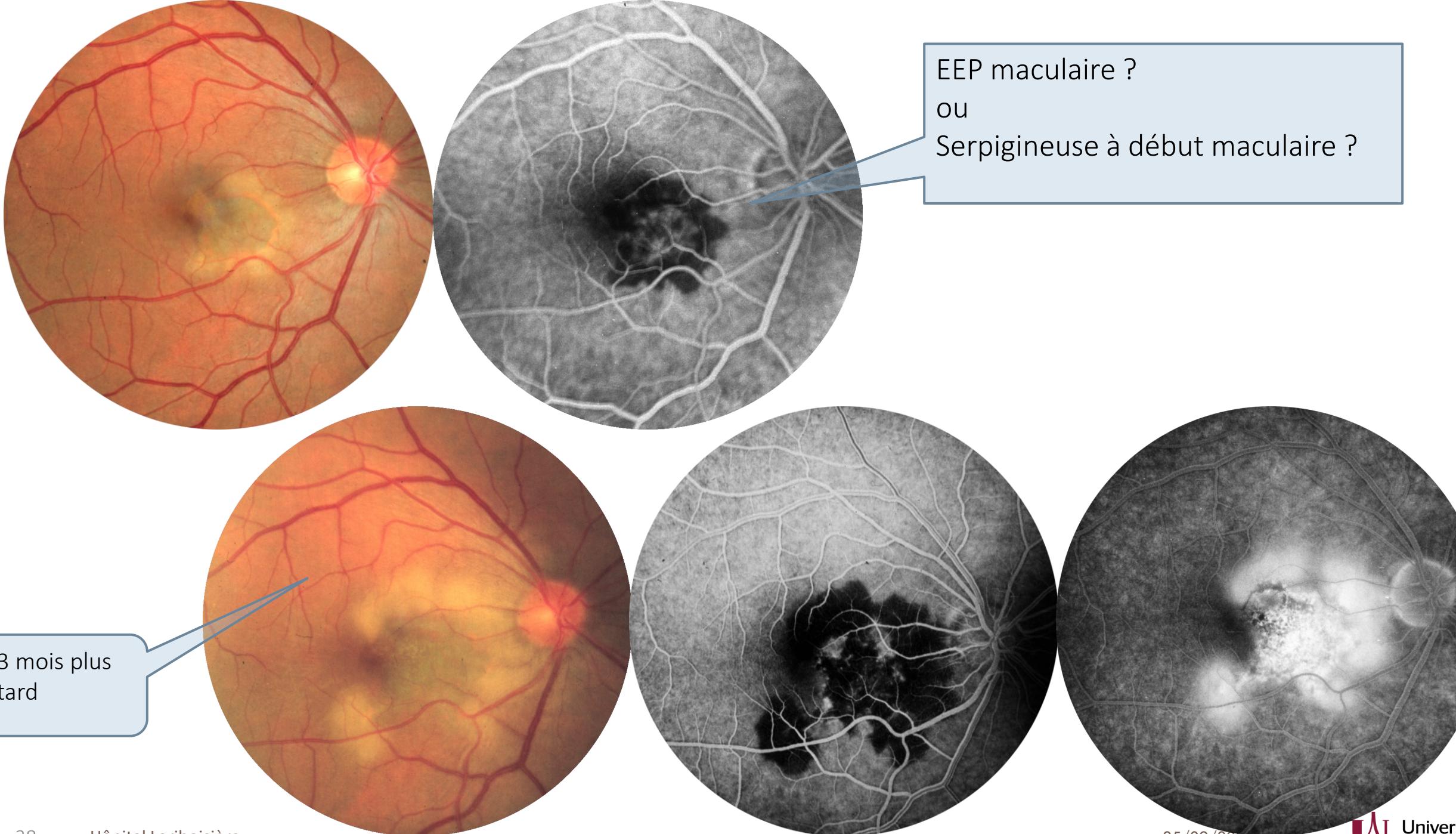
We studied seven patients with features of acute posterior multifocal placoid pigment epitheliopathy, all of whom had recurrent disease.

CASE REPORTS

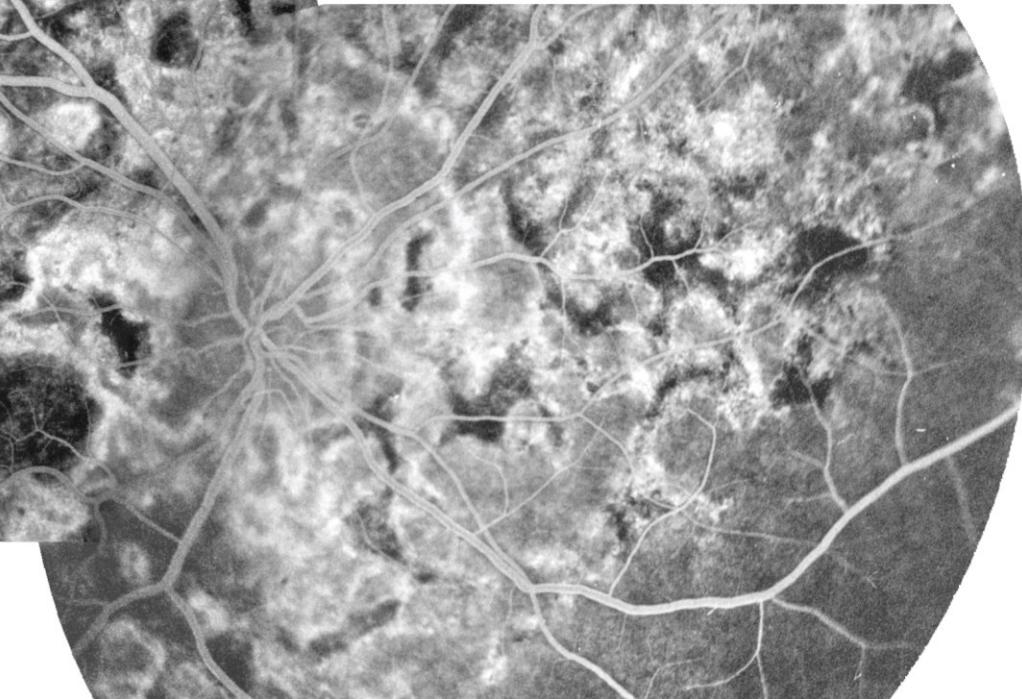
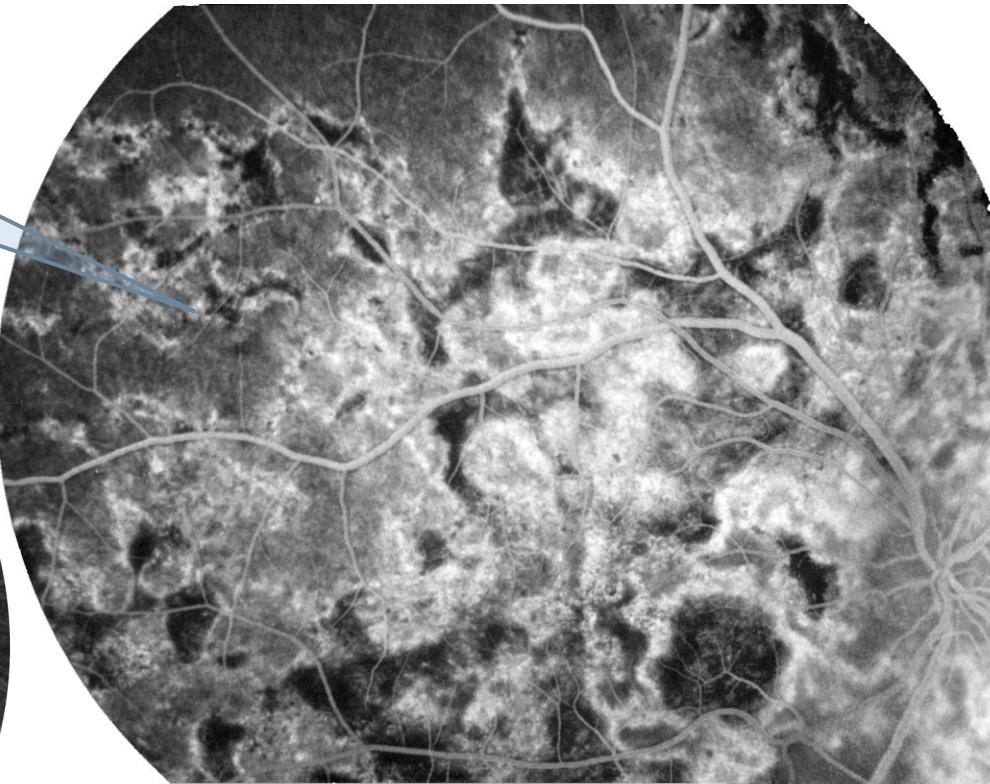
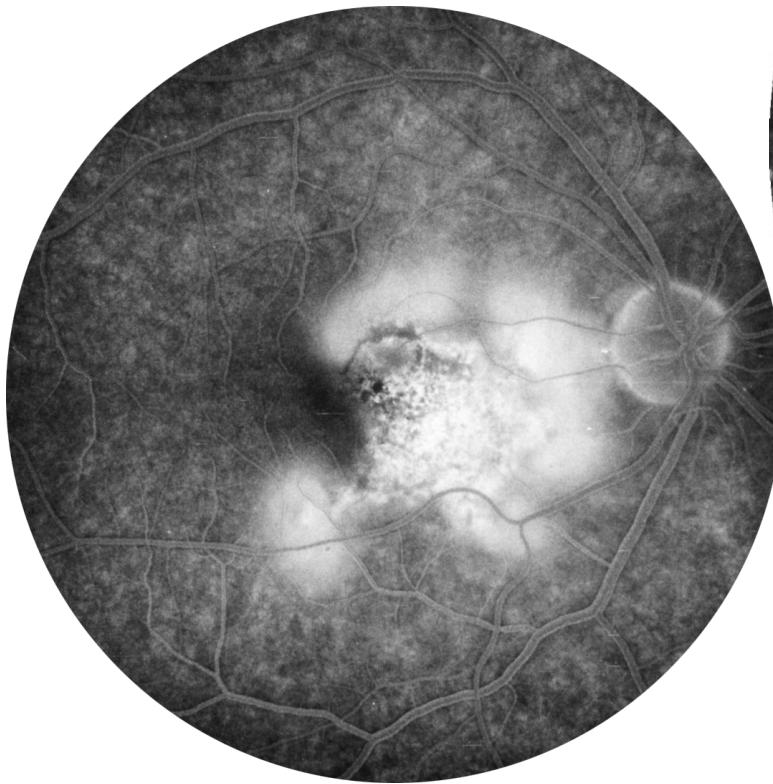
Case 1—This 25-year-old man was first seen at another hospital in January 1980, with a two-week history of "black spots" in his left eye. He had had epididymo-orchitis in 1977, nonspecific urethritis in 1979, and painful red skin eruptions on his legs, which had been diagnosed as erythema nodosum. He was taking tetracycline for inguinal lymphadenopathy at the time he was examined.

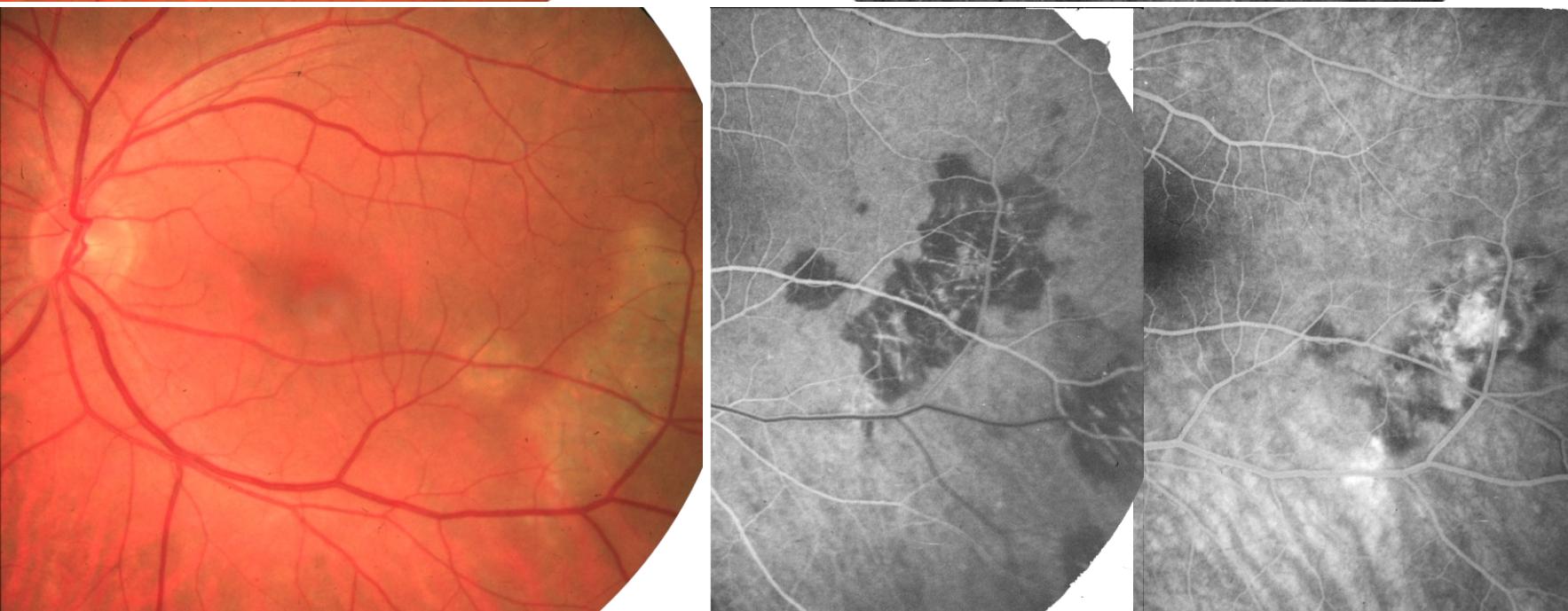
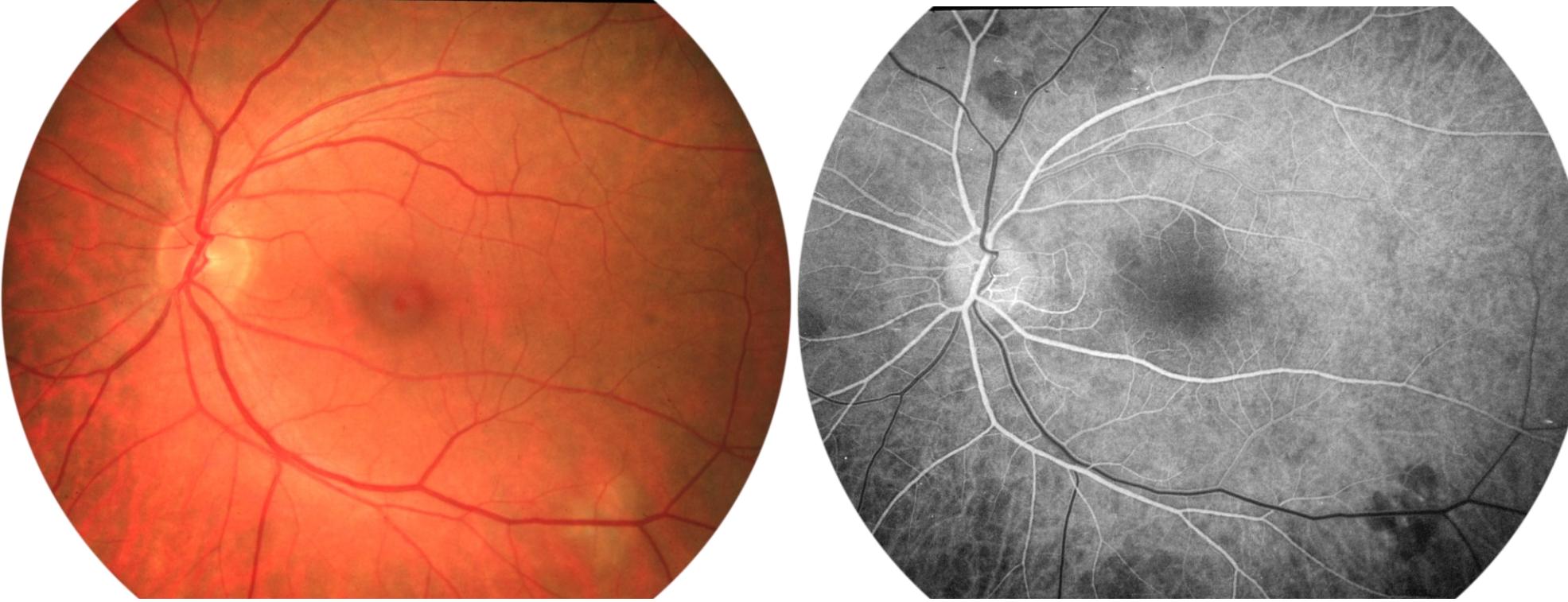
©AMERICAN JOURNAL OF OPHTHALMOLOGY 98:203-207, 1984

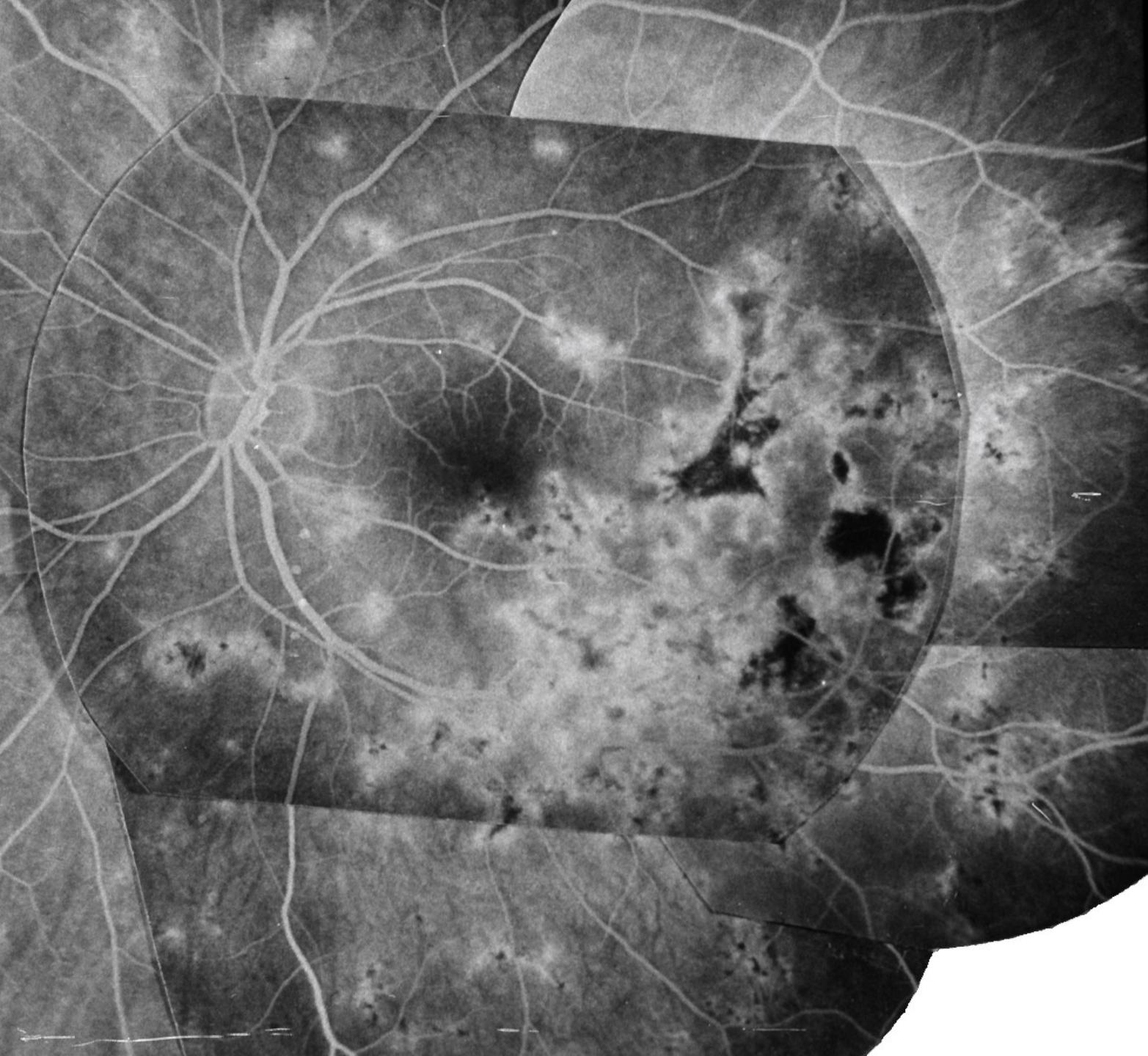
203



1 an plus tard malgré
corticothérapie et immuno-
suppresseurs







EEP/Choroidite serpigineuse

- EEP récidivante, Choroïdite Géographique, Ampiginous Chroïditis, Choroïdite placoïde subintrante:
 - Mêmes problèmes de traitement que la Choroïdite serpigineuse

CLINICAL SCIENCES

Relentless Placoid Chorioretinitis

A New Entity or an Unusual Variant of Serpiginous Chorioretinitis?

B. Eric Jones, MD; Lee M. Jampol, MD; Lawrence A. Yannuzzi, MD; Michael Tittl, MD; Mark W. Johnson, MD; Dennis P. Han, MD; Janet L. Davis, MD; David F. Williams, MD

Conclusion : Cette entité présente des caractéristiques cliniques similaires à l'EEP et à la choroïdite serpigineuse mais a une évolution progressive et les lésions s'étendent largement.

Elle peut représenter une variante de la Choroidite Serpigineuse ou être une nouvelle entité. Nous l'appelons une choriorétinite placoïde subintrante.

Arch Ophthalmol. 2000;118(7):931-938.



MAJOR REVIEW

Serpiginous Choroiditis

Wee-Kiak Lim, FRCOphth, FRCS(Ed), MMED,^{1,2} Ronald R Buggage, MD,¹ and Robert B Nussenblatt, MD¹

Parfois, les lésions peuvent également se produire en périphérie soit isolées soit multifocales décrites comme un "choroïdite serpigineuse multifocale" "choroidite ampigineuse" ou plus récemment sous le nom de "choriorétinite placoïde subintrante" Lyness et Bird, en 1984, ont décrit une forme d'APMPPE qui ressemble à une choroïdite serpigineuse dans sa bilatéralité, ses caractéristiques angiographiques et les perturbations pigmentaires qui en résultent et l'évolution clinique récurrente. La seule différence réside dans la nature multifocale des lésions qui n'étaient pas des extensions des anciennes lésions.

C. ATYPICAL VARIANTS—"AMPIGINOUS" CHOROIDITIS (FIG. 3)

Occasionally the lesions may also occur in the periphery in isolation or in a multifocal pattern described in a few reports as "multifocal serpiginous choroiditis,"³¹ "ampiginous choroiditis,"^{13,56} or most recently as "relentless placoid chorioretinitis."³⁹ Lyness and Bird in 1984 described a recurrent form of acute posterior multifocal placoid pigment epitheliopathy (APMPPE) that resembles serpiginous choroiditis in its bilateral nature, fluorescein angiographic features, resultant pigmentary disturbances and the recurrent clinical course.⁴⁹ The only

Choroidite Serpigineuse et Tuberculose

Presumed Tubercular Serpiginouslike Choroiditis

Clinical Presentations and Management

Vishali Gupta, MD,¹ Amod Gupta, MD,¹ Sunil Arora, PhD,² Pradeep Bambery, MD,³ Mangat Ram Dogra, MD,¹ Anita Agarwal, MD⁴

Ophthalmology 2003;110:1744–1749

- 11 cas de choroidite serpigineuse chez des patients tuberculeux IDR + ; Rx poumons amélioration sous traitement antituberculeux



Choroidite Serpigineuse et Tuberculose

MAJOR REVIEW

Les patients...provenant de régions où la tuberculose est endémique, peuvent présenter des modifications du fond de l'œil simulant la CS, mais qui présentent des signes de tuberculose active et/ou la présence de l'ADN mycobactérien dans l'humeur aqueuse.

C'est ce qu'on appelle la choroïdite de type serpigineux,
mais nous préférons le terme de
choroïdite serpigoïde multifocale (CSM).

La distinction est cruciale avec la choroïdite serpigineuse pour éviter de traiter inutilement la CS avec des agents antimicrobiens

Serpiginous Choroiditis and Infectious Multifocal Serpiginoid Choroiditis

Hossein Nazari Khanamiri, MD, and Narsing A. Rao, MD

Department of Ophthalmology, Doheny Eye Institute, Keck School of Medicine of the University of Southern California, Los Angeles, California, USA

Abstract. Serpiginous choroiditis (SC) is a posterior uveitis displaying a geographic pattern of choroiditis, extending from the juxtapapillary choroid and intermittently spreading centrifugally. The choroiditis involves the overlying retinal pigment epithelium, and the outer retina. This intraocular inflammation typically involves both eyes in otherwise healthy, middle-aged individuals with no familial or ethnic predilection. Pathogenesis is unclear; based on limited histopathologic studies, however, favorable response to immunosuppressive agents, and the absence of association with systemic or local infectious or noninfectious diseases, an organ-specific autoimmune inflammation seems likely to be the underlying process. Patients, particularly from tuberculosis-endemic regions, may present with fundus changes simulating SC, but show evidence of active tuberculosis and/or the presence of mycobacterial DNA in the aqueous humor. This has been referred to as serpiginous-like choroiditis, but we prefer the description multifocal serpiginoid choroiditis (MSC). We present the distinguishing features of SC and infectious multifocal serpiginoid choroiditis simulating SC. The distinction is crucial to avoid unnecessarily treating SC with antimicrobial agents. Advances in diagnostic and imaging modalities can help differentiate SC from MSC. Novel local and systemic treatment approaches improve the outcome and preserve vision in SC. (*Surv Ophthalmol* 58:203–232, 2013. © 2013 Elsevier Inc. All rights reserved.)

Traitement de la Choroidite serpigineuse

- Corticoides :bolus
- Triple association:
 - corticoides+azathioprine+ciclosporine
 - Résolution des poussées au bout de 2S et maintient de l'AV
 - mais récidive à l'arrêt du traitement
 - Au total pas de diminution des récurrences
- Difficulté:
 - Les récidives sont imprévisibles , combien de temps poursuivre le traitement ?

Thank you for your attention,

a.gaudric@gmail.com



Service d'Ophtalmologie
Hôpital Lariboisière



Hôpital Lariboisière
Hôpital Saint Louis
AP-HP.Nord



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Adolphe de ROTHSCHILD
LA RÉFÉRENCE TÊTE ET COU

Merci de votre attention

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