

Grey hyper-reflective subretinal exudative lesions in exudative age-related macular degeneration

ORES R, PUCHE N, QUERQUES G, BLANCO-GARAVITO R, MERLE B, COSCAS G, OUBRAHAM H, SEMOUN O, SOUÏED EH

Retina Creteil, University Paris Est Creteil, Creteil, France



Purpose:

The presence of hyper-reflective subretinal lesions that appear grey on spectral domain optical coherence tomography (SD-OCT), was observed in our clinical setting in patients diagnosed with exudative age-related macular degeneration (AMD). These lesions presented certain characteristics, which we suspected to be signs of choroidal neovascularization (CNV) activity.

We decided to perform a study of these lesions with the purpose of observing and analyzing their response to anti-VEGF therapy.

We hypothesized that these subretinal hyper-reflective lesions could regress after treatment with intravitreal anti-VEGF therapy.

Methods:

Retrospective interventional study.

Data from 28 consecutive patients affected with neovascular AMD that presented subretinal hyper-reflective lesions as visualized by SD-OCT were collected.

At study entry, patients underwent treatment if neovascular activity was present (group A), defined as either decrease of best corrected visual acuity (at least 1 ETDRS line), and/or presence of fluid on OCT, and/or leakage from CNV on fluorescein angiography. If none of these criteria were found at study entry, patients were observed for signs of evolution (control visit at one month, standard protocol in our clinic) (Group B).

We retrospectively assessed the morphological effects of the treatment on grey hyper-reflective subretinal lesions, from baseline to 2 months and to final visit (6 months).

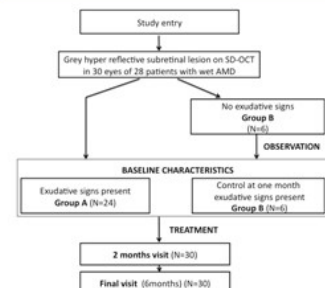


Figure 1: Studyflow chart of hyper-reflective subretinal exudative lesions in exudative age-related macular degeneration. Thirty eyes of 28 patients with exudative age-related macular degeneration presenting with a grey hyper-reflective subretinal lesion were included

Characteristics	No
Age, y (mean \pm SD) ^a	77.3 \pm 7.2
No. of eyes	30
No. of patients	28
Gender (patients)	
Male	5
Female	23
Type of CNV ^b (eyes)	
Classic	8
Occult	14
Minimally classic	4
Retinal angiomatous proliferation	4
Eyes with previous treatment	
Naïve eyes	21
Intravitreal ranibizumab	9
Photodynamic therapy	2
Laser photocoagulation	1

Table 1. Summary of clinical findings in the exudative age-related macular degeneration population affected with grey hyper-reflective subretinal lesions.
^aSD=Standard deviation, ^bCNV=choroidal neovascularization

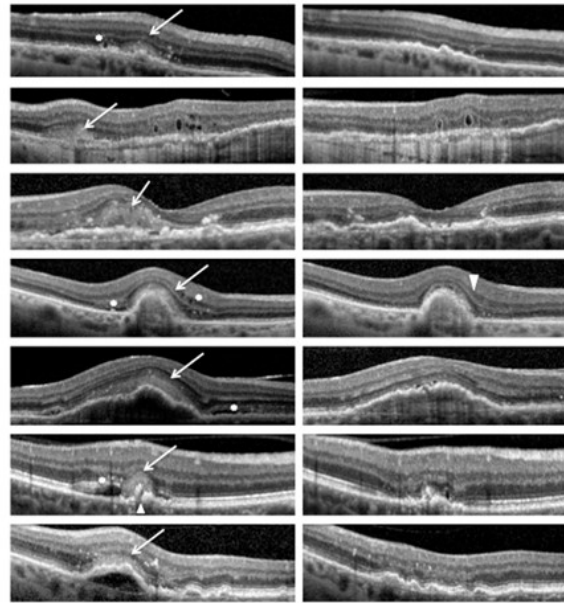


Figure 2: Spectral domain Optical coherence tomography (SD-OCT) follow up of grey hyper-reflective subretinal lesions before and after treatment. Spectral domain optical coherence tomography (SD-OCT) images. Each horizontal line corresponds to one patient. The right panel corresponds to the SD-OCT before treatment and the left panel to the SD-OCT after treatment. The presence of grey hyper-reflective subretinal lesions are underlined by arrows and exudative signs by stars. Note the total regression of both grey lesions and exudative signs for almost all patients.

Results:

Thirty eyes of 28 patients (5 male, 23 female, aged 57-91 years) were included.

At study entry, grey lesion was associated with exudative features in 24/30 eyes (80%), including subretinal fluid (SRF) in 20/30 of eyes (67%), and retinal cystoid spaces in 11/30 of eyes (37%). Twenty-four eyes with exudative features at study entry received prompt treatment; 6 eyes without exudative features at study entry received deferred treatment (after one-month observation), exudative signs emerged (SRF in 3/6 eyes and retinal cystoid spaces in 5/6 eyes).

Ninety-three percent of the grey lesions responded to ranibizumab treatment at two months and 77% at six months. Grey hyper-reflective subretinal lesion thickness was significantly reduced after treatment at both two months (from $482 \pm 116 \mu\text{m}$ to $367 \pm 102 \mu\text{m}$, $P < 0.0001$) and six months (from $482 \pm 116 \mu\text{m}$ to $369 \pm 71 \mu\text{m}$, $P < 0.0001$).

	BEFORE TREATMENT (baseline)	AFTER TREATMENT (two-month visit)	P	AFTER TREATMENT (six-month visit)	P
Presence of grey lesion	30/30 (100%)	12/30 (40%)	non applicable	12/30 (40%)	non applicable
Grey lesion thickness (μm) (mean \pm SD) ^a	481 \pm 115	366 \pm 101	<0.0001	369 \pm 71	<0.0001
CMT (μm) (mean \pm SD) ^a	393 \pm 125	313 \pm 72	<0.0001	308 \pm 75	<0.0001
VA ^b (ETDRS letters ^c) (mean \pm SD) ^a	61 \pm 17.3	65.8 \pm 15.3	0.0071	64.7 \pm 16.3	0.0481
Mean follow-up (months)		2.1 \pm 0.8		6.2 \pm 1.8	
No of IVT ^d		1.90 \pm 0.92		3.6 \pm 1.8	
Other exudative features					
Subretinal fluid	23/30 (77%)	9/30 (30%)	0.00012	8/30 (27%)	<0.0001
Retinal cystoid spaces	16/30 (53%)	12/30 (40%)	0.2188	8/30 (27%)	0.0078
Hyper-reflective dots	26/30 (87%)	18/30 (60%)	0.0078	20/30 (67%)	0.0313

Table 2. Evolution of grey hyper-reflective subretinal lesions and other exudative features before and after treatment by anti-VEGF in patients with exudative age-related macular degeneration. ^aSD=standard deviation, ^bCMT=Central macular thickness, ^cVA=Visual Acuity, ^dETDRS= Early Treatment of Diabetic Retinopathy Study, ^eIVT= Intravitreal injection. Exudative features at baseline correspond to the previous examination before anti-VEGF intravitreal injection. Grey hyper-reflective subretinal lesion thickness measurement was done by measuring the highest retinal thickness vertically in the zone of the lesion, before and after treatment.

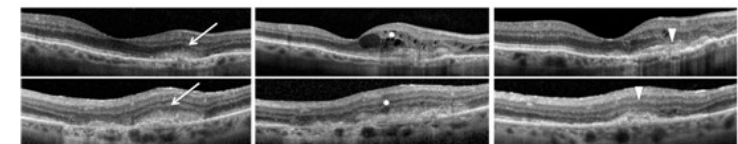


Figure 3: Spectral domain Optical coherence tomography (SD-OCT) follow up of Group B patients (deferred treatment). Spectral domain optical coherence tomography (SD-OCT) images. Each horizontal line corresponds to one patient. The right panel corresponds to the SD OCT before treatment, the middle panel to the SD-OCT after one month follow up (without treatment) and the left panel to the SD-OCT after treatment. Presence of grey hyper-reflective subretinal lesions are underlined by arrows and exudative signs by stars. Note without treatment the increase of grey lesion for all patients and exudative sign apparition. After treatment, note the partial regression of grey lesion and retinal cysts for almost all patients.

Conclusion:

Our findings suggest that grey hyper-reflective subretinal lesions might be considered as a qualitative criterion for retreatment of exudative AMD.

It may represent an early sign of active choroidal neovascularization, and should prompt to early treatment.

References:

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