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Anatomic and functional results of Vascularized Pigment Epithelial Detachment treated with ranibizumab: One year follow-up

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Purpose

• Retinal pigment epithelium detachments (PEDs) in neovascular age-related macular degeneration (nAMD) are frequently associated with choroidal neovascularization and are of high risk of severe vision loss[1,2,6] The fibrovascular PED is one of the forms of occult choroidal neovascularization (O-CNV) identified by fluorescein angiographic imaging (FA).

•The most prospective trials have excluded patients with serous PEDs involving the fovea center and serous PEDs greater than 50% of the total lesion size according to the facts that some complications as tear of RPE, or huge hemorrhage inducing a decrease of vision might occur frequently[3,4]. This led to lack of knowledge about the effects of anti-VEGF agents on large and high PEDs.

•The aim of this study is to assess anatomical and functional results after one year of treatment of high PEDs with ranibizumab in real-life.

Methods

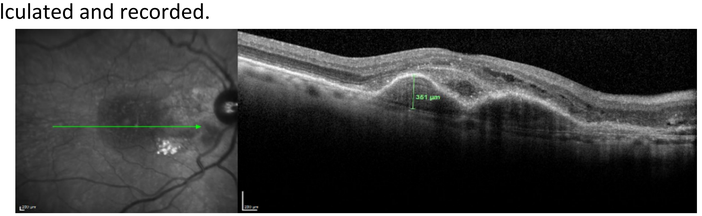
A retrospective, single-center study reviewing clinical and imaging data of consecutive patients who underwent intravitreal injection of ranibizumab (IVR) between January 1st 2011 and June 30th 2013. Imaging data included spectral-Domain OCT (SD-OCT), FA and ICG-angiography (Spectralis HRA Heidelberg Engineering, Heidelberg Germany).

Inclusion criteria : Age > 50 years, CNV associated with a PED in the study eye ***with a maximal height ≥ 250 µm***, treatment-naive study eye and one-year follow-up. Patients were treated with a 3 monthly injections (loading phase) followed by a Pro-Re-Nata (PRN) schedule.

Exclusion criteria : Incomplete data records at baseline, treatment by any other anti-VEGF than ranibizumab during the year of follow-up or by PDT.

Data were recorded at baseline, M3, M6 and M12. Data were analysed for age, gender, type of CNV, BCVA, central macula thickness (CMT), macular hemorrhage, maximal height of the PED (measured from pigment epithelium to Bruch's membrane), subretinal fluid (SRF) and/or intra-retinal fluid (IRF), presence or absence of a pigment epithelium tear.

CMT was measured using Spectralis HRA incorporated software. Manual measurement was done in case of error in determination of retina layers by the software. Then, the internal limitante layer and The bruch's membrane layer were manually drawn by both the first two authors. Recalculation of the CMT was then recalculated and recorded.



We analyzed the number of IVR received during the follow-up and the number of visits.

Statistical analysis was performed using StataCorp 2013 (*Stata Statistical Software: Release 13*. College Station, TX, USA: StataCorp LP), a p value inferior to 0.05 was considered statistically significant.

Results:

2097 Charts. 116 eyes of 109 patients were included.

At Baseline

Gender, male/female:	36 / 73
Mean (±SD) age,years :	76.9 yrs (±8.3)
Mean (±SD) BCVA, LogMar :	0,41 (±0,32)
Mean (±SD) CMT, µm:	572 µm (±217)
Mean (±SD)PED height, µm:	458 µm (±185)

At Month 12

Mean (SD) BCVA :	0,32 (±34) p = 0.013
Improvement ≥ 3 lines :	25.9 %
Loss < 3 lines :	86,8%
Loss ≥ 3 lines :	11,2 %
Mean (±SD) monitoring visits:	9.5 (±1.84), (median 10)
Mean (±SD) injections :	6.83 (±2.39)
Anatomical changes :	**See Figure 1**

FIGURE 1 : ANATOMICAL AND VISUAL OUTCOME AFTER ONE YEAR FOLLOW-UP

	Baseline	M3	M6	M12
BCVA (±SD) LogMar	0.46 (±0.34)	0.41 (±0.32) p=0.011	0.41 (±0.33) p=0.019	0.39 (±0.34) p=0.013
CMT (±SD), µm	572.1 (±212.97)	402.39 (±171.86) p<0.0001	411.48 (±172.34) p<0.0001	396.59 (±216.59) p<0.0001
PED height (±SD), µm	458.16 (±185.23)	321.28 (±216.59) p<0.0001	332.52 (±191.72) p<0.0001	306.79 (±179) p<0.0001

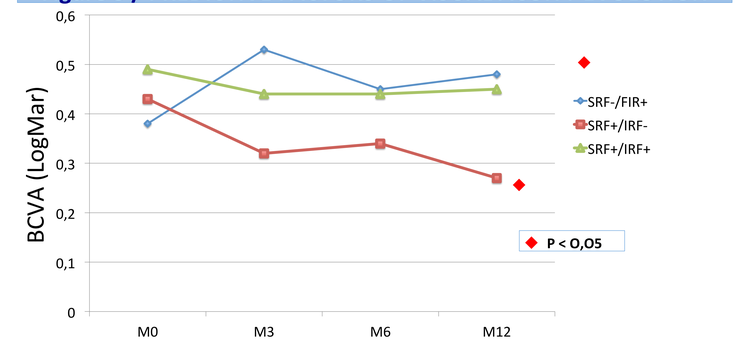
No association was found between evolution of BCVA and type of CNV, presence of hemorrhage at baseline (34.48%), presence of RPE-rip at baseline (7,8%), or with the height of PED or the amont of CMT.
However, BCVA at M12 was statistically better for younger patients, aged less than 80 years: 0.3 (±0.24) vs 0.51 (±0.4), p=0.0017).

FIGURE 2 : Functional and anatomical associations between persistant or reccurent fluid

BL BCVA	**p=0.087**	**NUMBER OF INJECTIONS**	**p=0.052**
M12 BCVA	**p=0.89**	**BL Hemorrhage**	**p=0.75**
BL CMT	**p=0.91**	**BL RPE-RIP**	**p=0.31**
BL MAX PED HEIGHT	**p=0.017**	**Intraretinal Fluid (IRF)**	**p=0.47**
M12 MAX PED HEIGHT	**p=0.028**	**Subretinal Fluid (SRF)**	**p=0.061**

Resolution IRF and SRF was statistically significant as 32,4% of eyes (n=72/105) were dry (p<0,0001) at M3, 22,3% (n=25/112) at M6 (p<0,0001) and 36,5% (n= 42/115) at M12 (p<0,0001).
40,5% of eyes presented persitant fluid at each visit (never dry). Comparison of patients with no fluid and those with persitant fluid indicate the followings:
- no significant difference between the two groups for BCVA and CMT both baseline and at M12
- the number of injections tended to be higher in patients with persistent fluid
-PED was statistically higher in patients with persistent fluid both at baseline and at M12.
- IRF was significantly associated with loss of vision at M12 (Figure 3)
- Visual acuity was more improved when the persistent fluid was subretinal fluid. (Figure 3)

Figure 3 / PREDICTIVE FACTORS OF VISUAL ACUITY EVOLUTION



Discussion & Conclusion

- The data of this study indicate that treatment with ranibizumab significantly improves visual acuity at one-year in nAMD patients with vascularized PED in routine clinical practice.
- Treatment with ranibizumab also reduced significantly PED height, intraretinal and subretinal fluid. The persistence of intraretinal fluid was significantly associated with a decrease of visual acuity after one year follow-up

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