

Aspect of The Macular Region in Spectral Domain Optical Coherence Tomography in Retinal Vein Occlusions

Youssoufou Souley Abdoul Salam, Chammout Fatima Zahra, Laaribi Nisrine, El Khoyaali Adil, EL Asri Fouad, Reda Karim and Oubaaz Abdelbarre

Ophthalmology Service, Military Hospital, Mohammed V University, Morocco.

*Correspondence:

Youssoufou Souley Abdoul Salam, Ophthalmology Service, Military Hospital, Mohammed V University, Morocco.

Received: 24 November 2019; Accepted: 28 December 2019

Citation: Youssoufou Souley AS, Zahra CF, Nisrine L, et al. Aspect of The Macular Region in Spectral Domain Optical Coherence Tomography in Retinal Vein Occlusions. *Ophthalmol Res.* 2019; 2(1): 1-3.

ABSTRACT

Introduction: Macular edema is the main cause of decreased visual acuity following retinal vein occlusions. We propose to study at the macular level the changes of retinal layers in OCT.

Material and method: This are a retrospective study of 43 patients with secondary macular edema to retinal vein occlusion (15 occlusions of the central vein and 28 venous occlusions). We analyzed the different modifications of the outer layers of the macula.

Results: The nuclear layer appears irregular and of abnormal density. The cystoid cubicles disorganize the outer nuclear layers. The outer limiting is fragmented and disappears in places, and the interface outer segments / inner segments appear thickened hyperdense and irregular. In our study, only ECF is statistically significantly associated with a decrease in visual acuity.

Discussion: Preliminary results of this study in agreement with what is currently admitted show retinal changes during venous occlusion of the retina.

Conclusion: The high resolution of the SD-OCT allowed analyzing the changes in the reflectivity at the level of the retinal layers, evoking alterations in the normal structure of photoreceptors related to macular edema. The evolution of these modifications seems to be correlated with the visual prognosis. A longer-term prospective study would formalize this relationship between imaging and prognosis.

Keywords

Macular edema, Optical Coherence Tomography, Retinal vein occlusions.

Introduction

Macular edema is a major sign that occurs during retinal vein occlusions. It is due to the accumulation of fluid in the retinal layers. Macular edema is the main cause of visual acuity decline following retinal vein occlusions. It is particularly visible in OCT (optical coherence tomography).

We propose to study at the macular level, the changes of retinal layers in OCT.

Materials and Methods

Our study is retrospective with 43 patients with macular edema secondary to retinal vein occlusion (including 15 occlusions of the central vein and 28 occlusions of venous branches).

We analyzed the different changes in the outer layers of the macula at the time of diagnosis. We reported these changes in a statistical

study, to see the elements that correlate with the initial level of visual acuity.

We used the SPSS 20 software in this statistical study. We did our study on an OCT (Spectral Domain) SD device.

Results

The average age of our patients is 61.07 ± 9.40 . 79.1% (34 cases) are men. 34.9% have OVCR (occlusion of the central vein of the retina). 65.1% (28 cases) have OBVRs. (Occlusion of retinal vein branch).

The average ECF is $518.77 \pm 157.72 \mu\text{m}$. The outer nuclear layer appears hypo-reflective, irregular, abnormal density and thick increase in 62.8% of cases. The outer plexiform layer appears hypo reflective and increased thickness due to fluid infiltration in 60.5% of cases.

External limiting is fragmented and disappears in parts in 69.8% of cases (Figure 1).

The clearly visible external segment / internal segment interface appears thickened hyperdense and irregular in 20.9% of cases (Figure 2).

Associated signs are often present such as: vitreomacular adhesion, epi-retinal membrane, subretinal exudates of material or fibrosis, lipidic retinal exudates and intra-retinal hemorrhages.

In simple linear regression, only: ECF (central foveal thickness), the appearance of the layers of the pigment epithelium, the appearance of the external and internal article interface of the photoreceptors, the appearance of the external limiting agent; the appearance of the outer plexiform layer are correlated at the level of initial visual acuity.

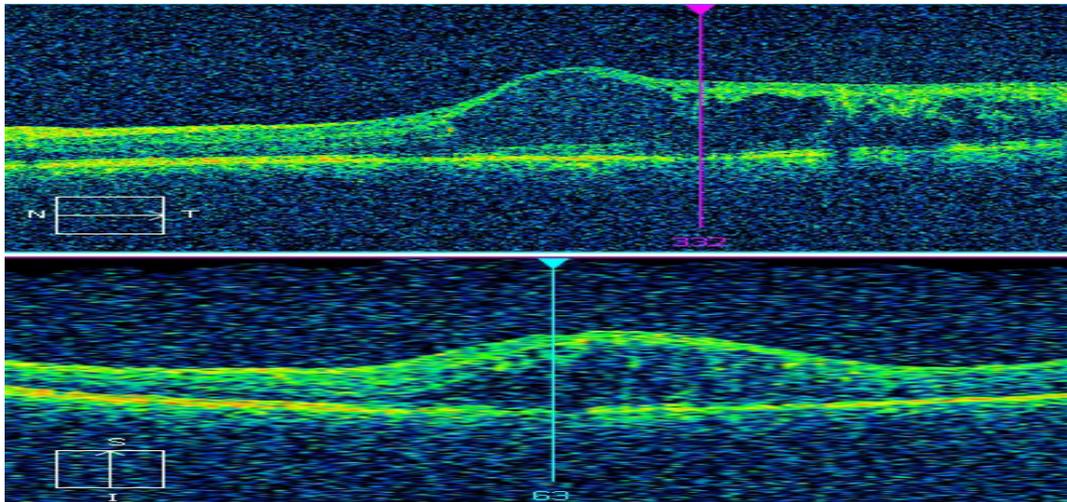


Figure 1: External limiting is fragmented and disappears in parts.

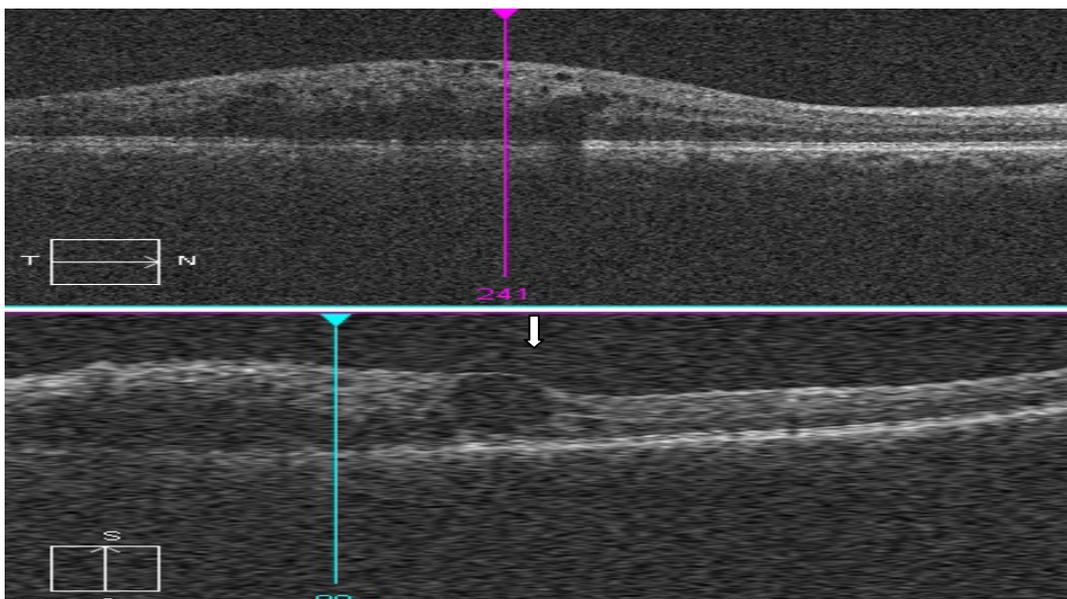


Figure 2: The clearly visible external segment / internal segment interface appears thickened hyperdense and irregular.

By adjusting these values, only ECF is associated statistically significantly with the decrease in visual acuity.
 $p = 0.01$ β at 95% [-0.015; -0.001].

In simple linear regression, the appearance of the external and internal article interface of the photoreceptors, the outer lamina and the outer plexiform are associated with the initial level of the central foveal thickness.

By adjusting these values, only the outer limiting is associated statistically significantly with the ECF.

$p = 0.02$? 95% [20.25; 224.24].

Discussion

The pathology of retinal vascular occlusions includes a sudden circulatory disorder. The OCT allows appreciating, the consequences of the disorders of the vascular permeability, by visualizing the retinal exudation and the retinal edema which result from it, or also the consequences of the non infusion and the ischemia [1].

Martinet and Al found in a series of 50 patients that 86% of patients had macular edema with an average ECF of 617μ [2].

In our study, macular edema is present in 93% of cases in the initial phase.

The average ECF was 518.77 ± 157.72 .

OCT in Spectral Domain (SD-OCT) allows quantifying cystoids macular edema and provides additional data such as the topography of fluid accumulation in the retinal layers or also in the sub retinal space [1]. Macular edema is particularly severe in acute phase OVCR.

It predominates in the outer layers of the retina. It can be accompanied by a fovea detachment. Small hemorrhages can also be found inside these stalls.

In our study, edema predominates in the outer nuclear and plexiform layers. Serous retinal detachment is present in 25.6% of cases. In the literature the DSR (retinal serous detachment) is often of the order of 64%. Studies in OBVRs have suggested that visual

function is correlated with ECF and that it is correlated with the integrity of the inner segments and outer segments of fovea-like photoreceptors [3].

In our study, only ECF is correlated with visual function.
 $p = 0.01$ β at 95% [-0.015; -0.001].

The ECF is associated statistically significantly in our study with the appearance of the external limiting
 $p = 0.02$? 95% [20.25; 224.24].

Thanks to the better definition of the scans, the SD-OCT makes it possible to highlight the presence and the integrity of the external limiting membrane as well as the interface between inner and outer segments of the photoreceptors, which has provided important information for the prognosis.

Conclusion

The high resolution of the SD-OCT allowed analyzing the changes in the reflectivity at the level of the retinal layers, evoking alterations in the normal structure of photoreceptors related to macular edema.

The evolution of these modifications seems to be correlated with the visual prognosis.

A longer-term prospective study would formalize this relationship between imaging and prognosis.

References

1. Coscas G, Zourdani A, Glacet-Bernard A. Tomographie en cohérence optique. In : Glacet-Bernard A, editors. Occlusions veineuses rétinienues. Bulletin des sociétés d'ophtalmologie de France d'Ophtalmologie. Rapport annuel. Paris. 2011; 164-172.
2. Martinet V, Guigui B, Glacet-Bernard A. et al. Macular edema in retinal vein occlusion : correlation study between optical coherence tomography, fluorescein angiography and visual acuity. 2008; 32: 369-377.
3. Ota M, Tsujikawa A, Murakami T, et al. Foveal photoreceptor layers in eyes with persistent cystoid macular edema associated with branch retinal vein occlusion. Am J Ophthalmol. 2008; 145: 273-280.