ASSESSMENT OF MACULAR PERFUSION CHANGES AFTER PARS PLANA VITRECTOMY IN DIABETICS USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY

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INTRODUCTION

Diabetic retinopathy is a common complication in type 1 and type 2 diabetes. Diabetic retinopathy is the ocular manifestation of end-organ damage in diabetes mellitus. Diabetic retinopathy has been classically considered as a microvascular disease of the retina. However, growing evidence suggests that retinal neuro degeneration is an early event in the pathogenesis of diabetic retinopathy, which could contribute to the development of microvascular abnormalities. Although defects in neurosensory function have been demonstrated in patients with diabetes mellitus prior to the onset of vascular lesions, the most common early clinically visible manifestations of diabetic retinopathy microaneurysm formation and intraretinal hemorrhages.

One of the advancements in the field of assessment of retinal microcirculation is the use of Optical coherence tomography angiography (OCT-A). it is a non-invasive, depth-resolved technique for imaging the retina and choroid microvasculature.

One of the management approaches to high-risk proliferative PDR is pars plana vitrectomy for persistent vitreous hemorrhage, tractional retinal detachment, tractional maculopathy.

AIM OF THE WORK

The aim of this study was to assess macular perfusion changes after pars plana vitrectomy in diabetics using optical coherence tomography angiography.

PATIENTS AND METHODS

This was an observational case-control, single-center study of the 60 eyes of 30 patients to assess the macular area using OCTA in diabetic eyes with a history of 23G pars plana vitrectomy (PPV) for diabetic vitreous hemorrhage, diabetic tractional detachment and diabetic tractional maculopathy, one month up to 2 years post vitrectomy and correlate the results to the other non-vitrectomized eye as a control at the Main University Hospital (Alexandria University).Inclusion criteria were patients with diabetic vitreous haemorrhage, diabetic tractional retinal detachment and diabetic tractional maculopathy.

The following examinations were conducted for the subjects Complete clinical ophthalmological examination which include visual acuity and best corrected visual acuity using E chart expressed in decimal notation and converted to log MAR, slitlampbio microscopy including dilated fundus examination using 78 diopter non-contact lens and intraocular pressure measurements using applanation tonometry (Goldmann).

All patients will do OCT and OCT angiography after at least one month of the pars plana vitrectomy for the operated eye and the non-operated fellow eye for the same patient as control using Optovue Angio Vue® (Optovue, Inc., Freemont, CA), which uses split-spectrum amplitude-decorrelation angiography algorithm, which minimizes motion noise. This system also allows quantitative analysis since it provides numerical data about flow area and flow density maps.

RESULTS
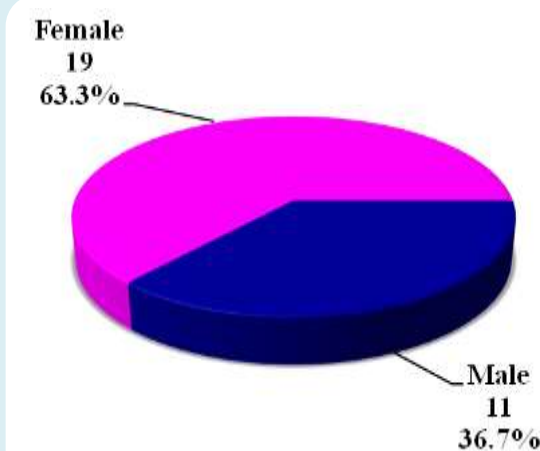
Figure1: Distribution of the studied cases according to sex (n = 30)
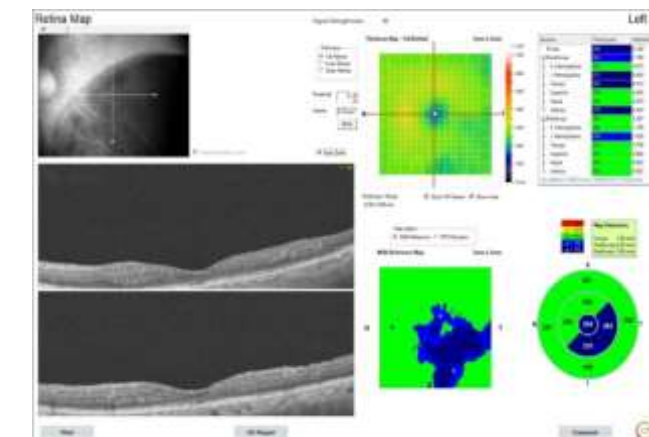

Figure 2: The OCTA of the left eye with measurement of retinal thickness using RTVue XR Avanti AngioVue software (Retinal map) of the left eye

Table: Comparison between cases and control according to postoperative BCVA expressed in LogMar (n = 30)

	Cases	Control	Z	p
Postoperative BCVA expressed in LogMar				
Min. – Max.	0.05 – 1.30	0.0 – 0.70	3.315*	0.001*
Mean ± SD.	0.54 ± 0.34	0.28 ± 0.20		
Median (IQR)	0.52 (0.30 – 0.82)	0.22 (0.15 – 0.52)		
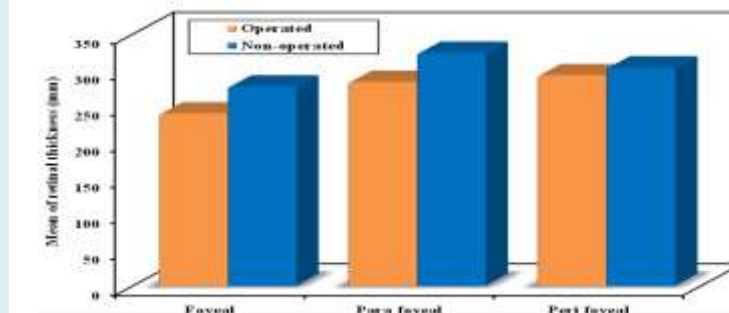
Figure 3: Comparison between operated and non-operated according to retinal thickness (n = 30)
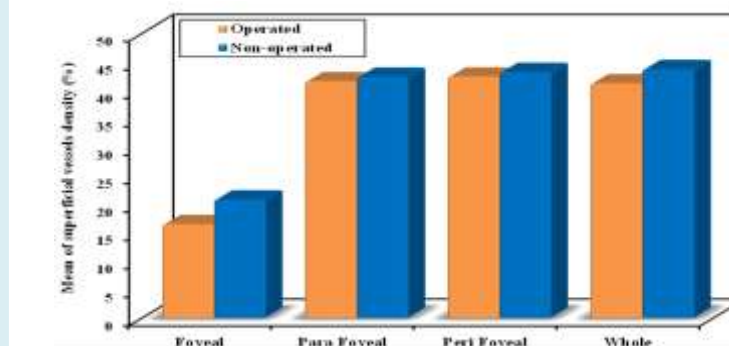
Figure 4: Comparison between operated and non-operated according to superficial vessels density (n = 30)

CONCLUSION

Based on our finding, the best corrected visual acuity (BCVA) (log MAR) was better for the control group compared to the study group, the study group foveal thickness was thinner than control group, there was a statistically significant difference in the whole superficial VD % for study group in comparison with control group, The size of foveal avascular zone in the superficial retinal layer for the study group was statistically larger compared to the control group superficial FAZ, there was a statistically significant in the study group Whole disc and Peri papillary compared to the control group, The whole superficial VD (%) show negative correlation with age.