

Evaluation of Choroidal Thickness Changes in Euthyroid Graves' Ophthalmopathy

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Abstract

Objective: Clinical manifestations of GO are caused by the over compression of orbital tissues within the restricted orbital bone cavity. Impaired ocular blood flow may disrupt the retinal microstructure and functions.. In this study we aimed to investigate the macular and choroidal thickness changes in GO compared with healthy subjects.

Materials and Methods: The study group comprised 50 adult patients with previously diagnosed Graves' Disease with ophthalmopathy who were on anti-thyroid treatment. For the assessment of GO activity, VISA (vision, inflammation, strabismus, and appearance) inflammatory score was used. When euthyroidism was achieved without side effects, the patients were referred to the ophthalmology clinic for Spectral-domain optical coherence tomography (SD-OCT) evaluation.

Results: Subfoveal, mean and temporal choroidal thicknesses were increased significantly in study group according to the controls. The mean choroidal thickness was elevated.

Conclusions: This elevation is because of the retroorbital inflammation even in this non-severe GO group. Choroidal thickness might be affected from the venous obstruction and congestion in patients with GO. The elevation of the choroidal thickness might be an early sign of venous congestion that occurs before the elevation of intraocular pressure.

Keywords: Graves' ophthalmopathy.

spectral-domain optical coherence tomography.
choroidal thickness

Table 1. VISA inflammatory scale.

Clinical findings	Score
Orbital pain (none, at rest, with gaze)	0-2
Chemosis	0-2
Eyelid oedema	0-2
Conjunctival injection	0-1
Eyelid injection	0-1
Total	0-8

Table 2. Characteristics of the patient and control groups.

Characteristics	Study group n= 50	Control group n= 50	P value
Age, years	36.2±5.3	35.4±6.0	0.50*
Males, n (%)	39/11	43/7	0.30*
BCVA, logMAR	-0.006±0.02	-0.008±0.02	0.69*
IOP, mmHg	16.1±2.2	15.9±1.9	0.86**
Axial length, mm	22.4±0.7	22.7±0.6	0.20**
Spherical equivalent, dioptres	-0.35±0.89	-0.33±0.63	0.52*
Exophthalmometry, mm	18.7±2.2	17.4±0.9	0.002*
BMI	24.2±1.9	24.3±1.6	0.69**
MBP, mmHg	88.9±4.3	88.3±4.7	0.53**
Disease duration, years	3.1±1.7	N/A	-
VISA score	4.7±1.3	N/A	-

BCVA = best- corrected visual acuity. logMAR= logarithm of the minimum angle of resolution. IOP= intraocular pressure. BMI= Body mass index. MBP = mean blood pressure. N/A= not applicable. VISA= vision, inflammation, strabismus, and appearance.

*Mann-Whitney U test. **Independent samples t-test.

Table 3. Choroidal thickness: differences between groups.

Choroidal thickness measurement location	Study group n= 50	Control group n= 50	P value*
Subfoveal	307.1±30.2	275.5±34.2	p<0.001
Temporal, 500 µm	314.3±31.6	274.2±34.9	p<0.001
Temporal, 1.000 µm	312.2±31.3	272.9±33.2	p<0.001
Temporal, 1.500 µm	303.9±28.3	267.6±31.8	p<0.001
Nasal, 500 µm	296.4±28.9	270.8±34.7	p<0.001
Nasal, 1.000 µm	278.5±30.4	263.5±34.1	p=0.023
Nasal, 1.500 µm	261.8±32.9	253.1±34.7	p=0.20
Mean	296.3±28.1	268.2±33.1	p<0.001

*Independent samples t-test.

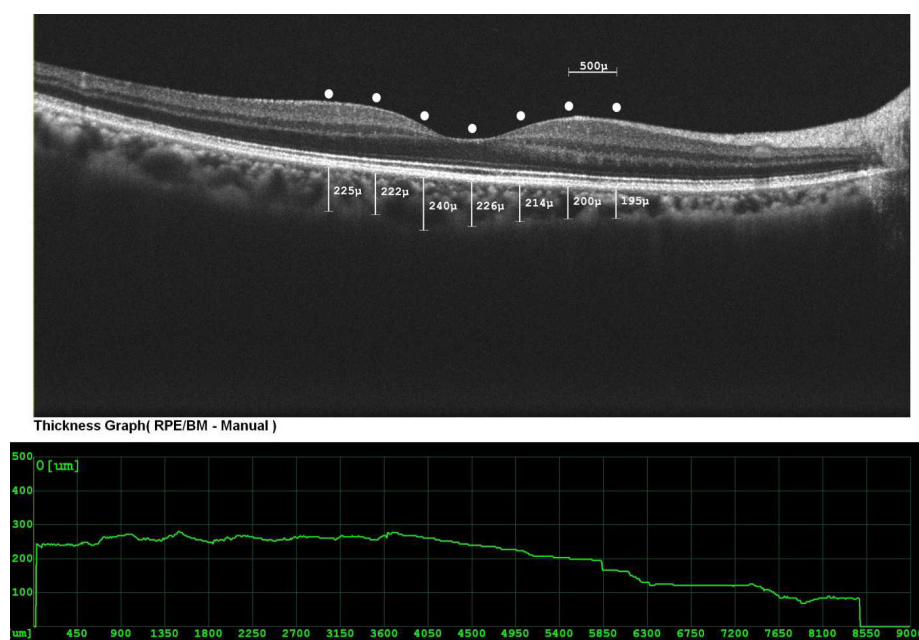
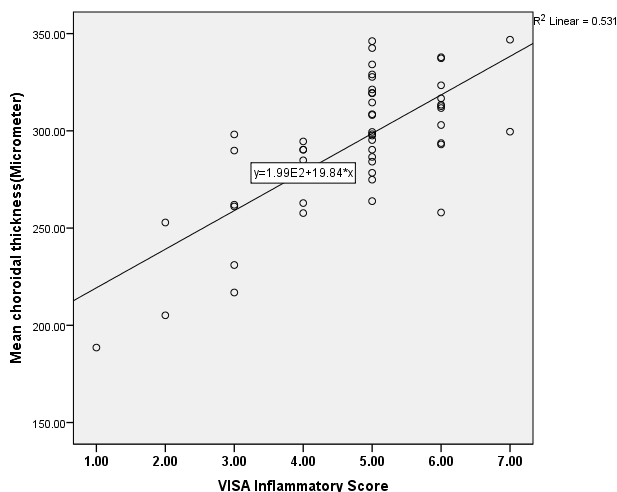


Figure 1: Representative choroidal thickness (CT) in Graves' ophthalmopathy (GO).

Figure 2: Correlation plot showing a positive relationship between the mean CT and the vision. inflammation. strabismus. and appearance (VISA) inflammatory scores of patients with GO ($R^2=0.531$; $P=0.001$).