Ganglion cell–inner plexiform layer thickness

The standard OCT protocol generates two quantitative RGC measures. The retinal nerve fiber layer (RNFL) thickness represents the number of axons, and the ganglion cell–inner plexiform layer thickness reflects the number of cell bodies and dendrites of RGCs

---

A case-control study included patients with pituitary neuroendocrine tumor in the Neurosurgery Department of Shanxi Provincial People's Hospital, between October 2019 and June 2021. Cranial MRI examination, Three Dimensional Optical Coherence Tomography Imaging, and visual field test (Humphrey Field Analyzer II750) were performed before and at 6months after the surgery.

Fifty-three pituitary neuroendocrine tumor patients (81 eyes) were enrolled; 15 patients (23 eyes) were in the visual field did not recover group (VFNR), and 38 patients (58 eyes) were in the visual field recovered group (VFR). The temporal retinal nerve fiber layer thickness (RNFL) (P = 0.002) and average RNFL (P = 0.009) in the VFNR group were significantly lower than in the VFR group. The superior nasal ganglion cell–inner plexiform layer thickness (GCIPL) (P = 0.001), inferior nasal GCIPL (P = 0.001) and average GCIPL (P = 0.01) were significantly lower in the VFNR group than in the VFR group (all P < 0.01).The multivariable logistic regression analysis showed that nasal inferior GCIPL was an independent risk factor for VF recovery (odds ratio (OR) = 1.376,95% confidence interval (CI):1.089-1.739,P = 0.007). In the received operating characteristics (ROC) analysis, the area under the ROC curve (AUROCs) was the highest for nasal inferior GCIPL (AUROC = 0.739).

In patients who underwent resection of pituitary neuroendocrine tumor, nasal inferior GCIPL was an independent risk factor of visual field defect recovery after surgery [1)].

A study indicates that GC-IPL measures could serve as an early marker of vision-threatening changes related to OPG and as a valuable link between MRI and visual function tests. Thinning of GC-IPL and differences in topography between eyes are strong indicators of and predictive of vision loss related to OPG [2)].

1)
Xia L, Wenhui J, Xiaowen Y, Wenfang X, Wei Z, Yanjun H, Xiaoyan P. Predictive value of macular ganglion cell-inner plexiform layer thickness in visual field defect of pituitary neuroendocrine tumor patients: a case-control study. Pituitary. 2022 Jul 14. doi: 10.1007/s11102-022-01248-6. Epub ahead of print. PMID: 35834154.
2)
Arnljots U, Nilsson M, Sandvik U, Myrberg IH, Munoz DM, Blomgren K, Hellgren K. Optical Coherence Tomography Identifies Visual Pathway Involvement Earlier than Visual Function Tests in Children with MRI-Verified Optic Pathway Gliomas. Cancers (Basel). 2022 Jan 9;14(2):318. doi: 10.3390/cancers14020318. PMID: 35053482; PMCID: PMC8774215.