Summary

Optical coherence tomography (OCT) is a noninvasive, transpupillary imaging technology that can examine tissues with high axial and transverse resolution (in µm) in vivo. It is widely used in ophthalmology to document optic disc, nerve fibre layer and macula at different levels in front of, within and under the retina up to 2 mm in depth due to light absorption. Management of macular diseases becomes more important now-a-days due to increasing amount of patients, improved diagnostic methods and new therapeutic options.
The aim of the study is to determine the role of OCT among the different examination methods on four patient groups of specific macular diseases: idiopathic macular hole, age-related macular degeneration, melanocytic choroidal tumors and circumscribed choroidal hemangioma.
I have followed-up 76 patients at the Eye department of Faculty hospital Kralovske Vinohrady, Prague from January 2002 to September 2008.
I have performed complete eye examination together with OCT (STRATUS OCT 3, Zeiss) on both eyes (n = 152) at all visits. "Radial lines" technique consisted of a spoke pattern protocol with 6 mm of scan length. The algorithm computed retinal map including foveal retinal thickness (FRT) and macular volume. NCSS software was used for statistics.
There was reported in the group of idiopathic macular hole (n = 25) that anatomical and functional results of operation are significantly depended on the macular hole diameter evaluated by OCT (p = 0.021 and 0.022 respectively). OCT helped to understand the stage 1b, which is difficult to determine by biomicroscopy. If the photoreceptor layer is consistent, the disease may become chronic (vitreomacular traction syndrome). The operation may be postponed in this case. On contrary, when the photoreceptor layer is broken the operation should be performed without a delay.
We concluded in the group of age-related macular degeneration (n = 20) that significant improvement of visual acuity (in decimal scale or in logMAR, p = 0.00097 and 0.00059 respectively) after combination therapy (photodynamic therapy with verteporfin and intravitreal ranibizumab) is related with significant decrease of FRT and macular volume on OCT (p = 0.0019 and 0.00055 respectively). There are borderline findings on biomicroscopy during the treatment in which fluorescein angiography was usually indicated in the past. Today, if there is no activity on OCT, patients suffer due to risk of this invasive examination much less.
We evaluated in the group of melanocytic choroidal tumors (n = 20) that presence of subretinal fluid on OCT is significantly depended on the diagnosis of melanoma (p = 0.000070). It is possible therefore to perform the treatment before its growth is documented. There was significant decrease of thickness (p = 0.033) and base of the tumor (p = 0.0040) and both OCT values (FRT and macular volume, p = 0.0090 and 0.0070 respectively) after therapy in our melanoma patients.
Final findings in the group of circumscribed choroidal hemangioma (n = 11) after photodynamic therapy with verteporfin were associated with visual acuity improvement (p = 0.0033) and decrease of FRT and macular volume (p = 0.0044 and 0.0010 respectively). Evaluation of resolution of subretinal fluid was possible by OCT which served as the endpoint of therapy and was achieved even without flattening of this benign tumor in majority of cases.
I showed in my theses that the role of OCT among the different examination methods in studied macular diseases is in recent period of their improved management essential.