INFLUENCE OF CORNEAL EDEMA ON REFRACTION AFTER CATARACT SURGERY

Author: *Eva Dručka*¹

Scientific research supervisor: Prof. *Guna Laganovska*²

¹ *Rīga Stradiņš University, Latvia*
² *Rīga Stradiņš University, Department of Ophthalmology, Latvia*

**Keywords.** Cataract surgery, corneal edema, refraction.

**Introduction.** Nowadays age-related cataract is the leading cause of blindness accounting for 47.8% of all cases worldwide. Transient corneal edema is one of the most common side effects of cataract surgery (*Kausar et al. 2015*). Corneal edema after phacoemulsification can cause refractive changes that limit fast visual rehabilitation (*Juan et al. 2013*).

**Aim.** To evaluate objective refraction and changes of central corneal thickness (CCT) as well patients’ subjective refraction 1 week after cataract surgery.

**Materials and methods.** This was prospective, nonrandomized, case series study of 23 eyes undergoing uneventful cataract surgery in a single university hospital. Informed consent was obtained in all cases. Central corneal thickness measurements with *Heidelberg Spectralis* Optical Coherence Tomography (OCT) and evaluations of subjective refraction were done before the surgery and on follow-up visits after first week. Corneal swelling was determined as the percentage change in CCT after surgery. Automated refraction was done on follow-up visits after week 1. All data were analyzed by SPSS 20.0.

**Results.** The study was composed of 23 eyes of 23 patients with age range from 53 to 88 years. The mean age ± standard deviation (SD) was 72.7 ± 9.52 [95% confidence interval (CI) = 68.8–76.59]. Among the patients, 16 or 69.6% [50.8–88.4] were females and 7 or 30.4% [11.6–49.2] were males.

The mean CCT was 532.57 ± 29.35µm [520.58–544.56] at baseline visit, but after 1 week – 570.13 ± 40.56µm [553.55–586.71]. The average CCT changes 1 week after cataract surgery was 7.10 ± 5.5% [4.85–9.35]. The minimal change of CCT was 0%, maximal – increased 19.4% of thickness. The correlation coefficient of CCT value before and after cataract surgery was r = 0.703 with p = 0.001 (paired t-test). No statistically significant difference was found between patient’s age, gender and increase of CCT (p > 0.05).

At baseline, the average subjective refraction was 0.23 ± 0.114 [0.18–0.28]. One week after surgery, the best corrected visual acuity (BCVA) improved in all cases with value of subjective refraction 0.7 ± 0.21 [0.61–0.79]. In addition, 17.4% [1.91–32.89] of cases had BCVA = 1. At baseline visual error correction to obtain BCVA was necessary for 34.8% [15.33–54.27] but 1 week after phacoemulsification – 60.1% [40.09–80.11]. Before surgery plus lens were used in 4.3% [0–12.59], after a week – in 21.8% [4.93–38.67] of all cases.

After 1 postsurgical week automated spherical refraction was +0.32 ± 0.76D [0.01–0.63]. In addition, automated cylindrical refraction was –0.57 ± 1.05D [-1–(-0.14)].

**Conclusions**

1. CCT after cataract surgery increased for about 7% in the end of first postsurgical week.
2. Although in most of cases corneal swelling was seen, subjective and objective refraction highly improved after cataract surgery.

Results of automated refraction showed tendency to hyperopia and astigmatism of eye.