Ziemer
OPHTHALMOLOGY

FEMTO LDV Z8
Cataract

Efficient workflow and short learning curve for cataract surgery with FEMTO LDV Z8[1]

Background
The purpose of this study is to assess the efficiency and effectiveness of the FEMTO LDV Z8 laser during cataract surgery in an outpatient cataract surgery center in Switzerland. The speed and precision with which a laser can achieve a high quality cataract removal is essential for positive clinical results and the overall satisfaction of the patient.

Methods
This prospective, observational study was performed at the Swiss Eye Research Foundation, Eye Clinic ORASIS, Reinach, Switzerland. Fourteen patients were subjected to unilateral FLACS which consisted of capsulotomy and lens fragmentation performed with the Ziemer LDV Z8 femtosecond laser system. Ease of phacoemulsification (4-point scale), completeness of capsulotomy (10-point scale), time for preparation of femtosecond laser (min), effective phacoemulsification time (sec), total duration of surgery (min), and safety of the procedure were evaluated. All surgeries were performed under topical anesthesia. Pupil dilation during surgery was achieved by combined use of phenylephrine and tropicamide eye drops. The integrated optical coherence tomography system imaged the ocular structures, and treatment parameters were determined in a customized manner using the laser platform settings wizard. Laser treatment started with lens fragmentation (an eight-piece pie cut pattern) followed by an anterior capsulotomy (5.0 mm diameter). The mean patient age was 73.5 ± 10.6 years (70.2 ± 8.3 years for males and 74.9 ± 11.3 years for females). Unilateral FLACS was performed in eight right eyes and six left eyes. Eight patients had grade 2 cataract and six patients had grade 3 cataract according to the Lens Opacities Classification System III.

Results
Laser preparation time before each operation was 3.6 ± 0.7 min. Effective phacoemulsification time was 2.5 ± 3.1 sec. The total duration of the FLACS operation was 16.3 ± 4.5 min. The total duration of the procedure for the different phases of the learning curve was 21.9 ± 1.8 min for the first surgery session (three patients), 16.0 ± 2.7 min for the second session (six patients) and 12.5 ± 1.1 min for the third session (five patients). Ease of fragmentation was 3.9/4 and completeness of capsulotomy was 9.9/10, as evaluated by the surgeon. No major complications, such as anterior capsule tears, posterior capsule tears or dropped nuclei occurred during the study. Moreover, none of the patients developed subconjunctival hemorrhage post-operatively.
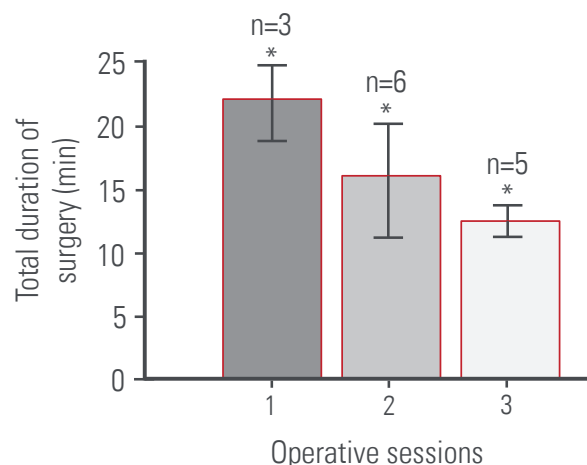

Fig 1. Learning curve of surgeries with the Z8. ANOVA reveals significance between each group (p<0.001)

Conclusions
In our clinic, using the LDV Z8, the learning curve to achieve high quality FLACS with no complications was less than 10 patients with an average total surgery time of around 12 min. The most important features of FLACS include the creation of precise, perfectly centered anterior capsulotomies, effective lens fragmentation and minimal complications, all key pieces to achieving a good surgical outcome and patient satisfaction. Due to the high frequency femtosecond LDV Z8 laser system, we were able to visualize the anterior corneal surface and posterior lens capsule regardless of cataract grade. In addition, the fluid-filled interface does not lead to formation of marked corneal folds which allow an uninterrupted laser treatment. These features enabled precise and complete removal of the capsule button.

References:

1 Pajic B, Vastardis I, Gatzioufas Z, and Pajic-Eggspuehler B. First experience with the new high-frequency femtosecond laser system (LDV Z8) for cataract surgery. Clinical Ophthalmology. 2014; 8: 2485–2489