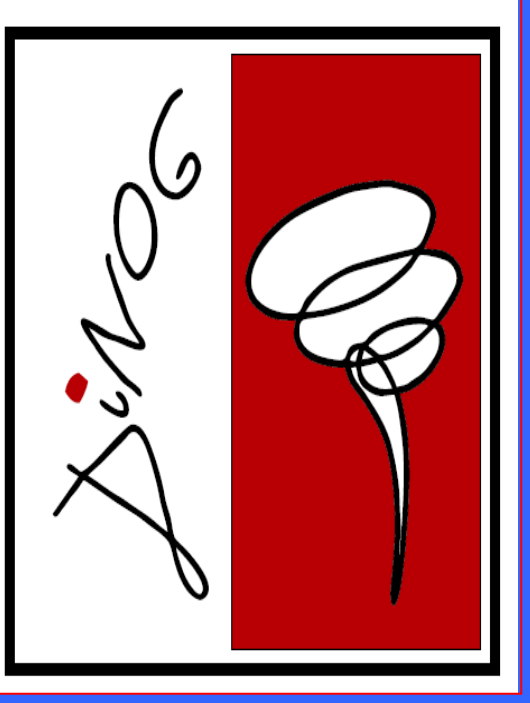




CO₂ laser-assisted sclerectomy (CLASS) for glaucoma



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INTRODUCTION

The OT-135 device (IOPtiMate; IOPtima Ltd., Ramat-Gan, Israel) is a beam manipulator system conjugated with a CO₂ laser. This system enables deep tissue ablation with reduced risk of perforation due to its effectiveness in ablating only dry tissues. As such, it offers potential alternative to non penetrating glaucoma surgery like deep sclerectomy, making the procedure simpler and less surgeon dependent while keeping its advantages if compared to trabeculectomy (i.e. less frequent overfiltration and choroidal detachments due to the avoidance of penetrating the anterior chamber).

PURPOSE

To evaluate the early post-operative course of CO₂ laser-assisted sclerectomy surgery (CLASS) in patients with primary open-angle glaucoma (POAG) and pseudoexfoliative glaucoma (XFG).

METHODS

The authors retrospectively reviewed a prospectively acquired database of glaucomatous patients treated with the CLASS procedure at our institution. A single surgeon performed CLASS procedures using a CO₂ laser system (IOPtima Ltd., Tel Aviv, Israel). After the dissection of a partial thickness scleral flap with a crescent knife, topical Mitomycin C 0.2 mg/ml was applied between the sclera and the conjunctiva for 3 minutes. The CO₂ laser system was used to ablate the scleral tissue underneath the scleral flap and expose the Schlemm's canal area until sufficient percolation was obtained. A red laser (HeNe) aiming beam was used to mark the scanning area boundaries. Both width and length scan dimensions could be changed according to each treated eye. As a sufficient and readily evident percolation zone was obtained, the scleral flap was repositioned and sutured with 10-0 nylon sutures (see also figure 1). Intraocular pressure (IOP), number of medications and complications were evaluated.

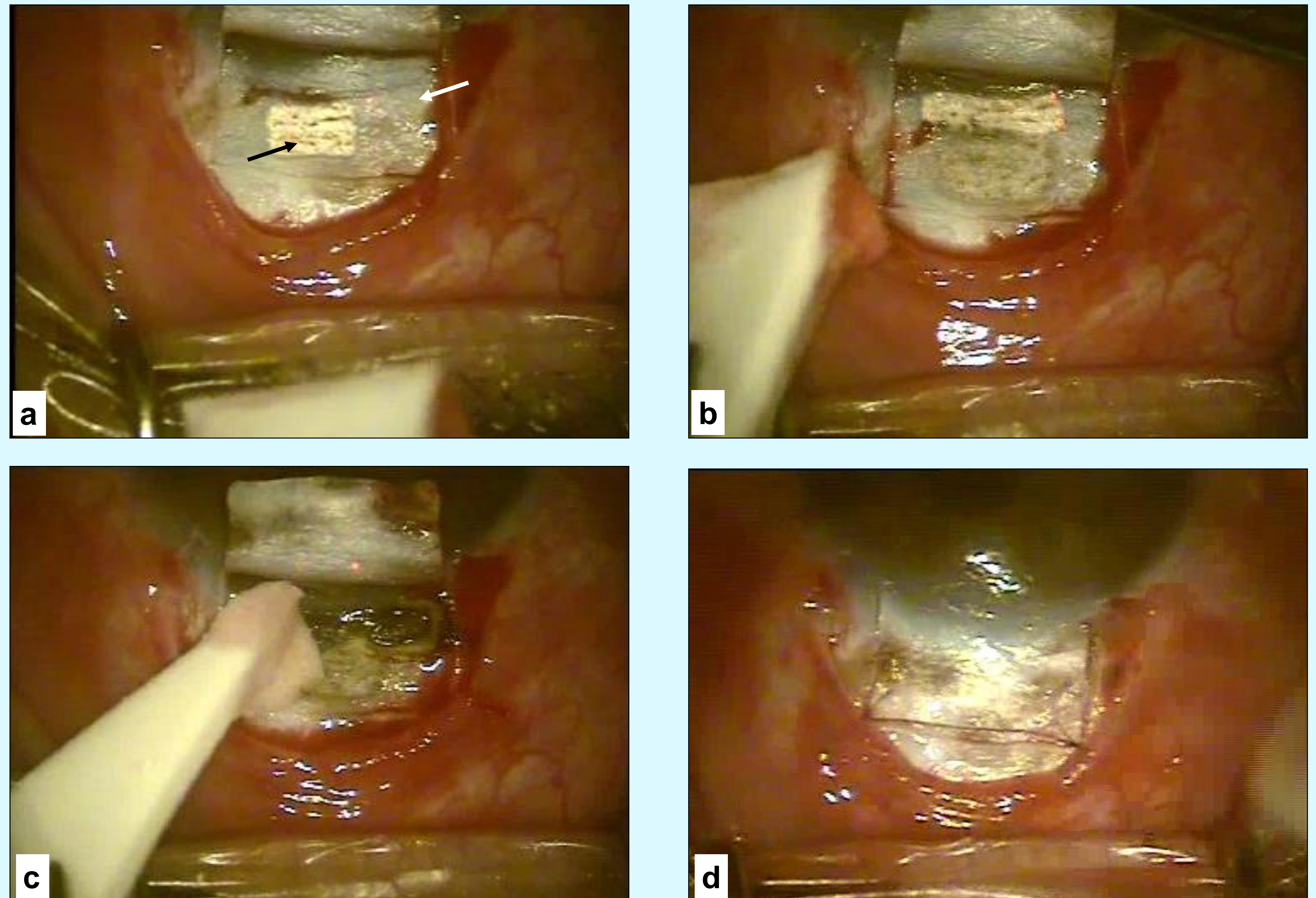


Figure 1. CLASS procedure. (a) After the creation of a scleral flap with conventional blade, initial CO₂ laser dissection is performed. The squared red laser aiming beam with 4 dots at the corners (white arrow) is visible near a treated area within the deep sclera (black arrow). Tissue ablation begins posteriorly and then the laser beam is repeatedly applied over an area including the Schlemm's canal (b) until sufficient percolation is clearly evident (c). The scleral flap is then closed with single 10-0 nylon sutures (d).

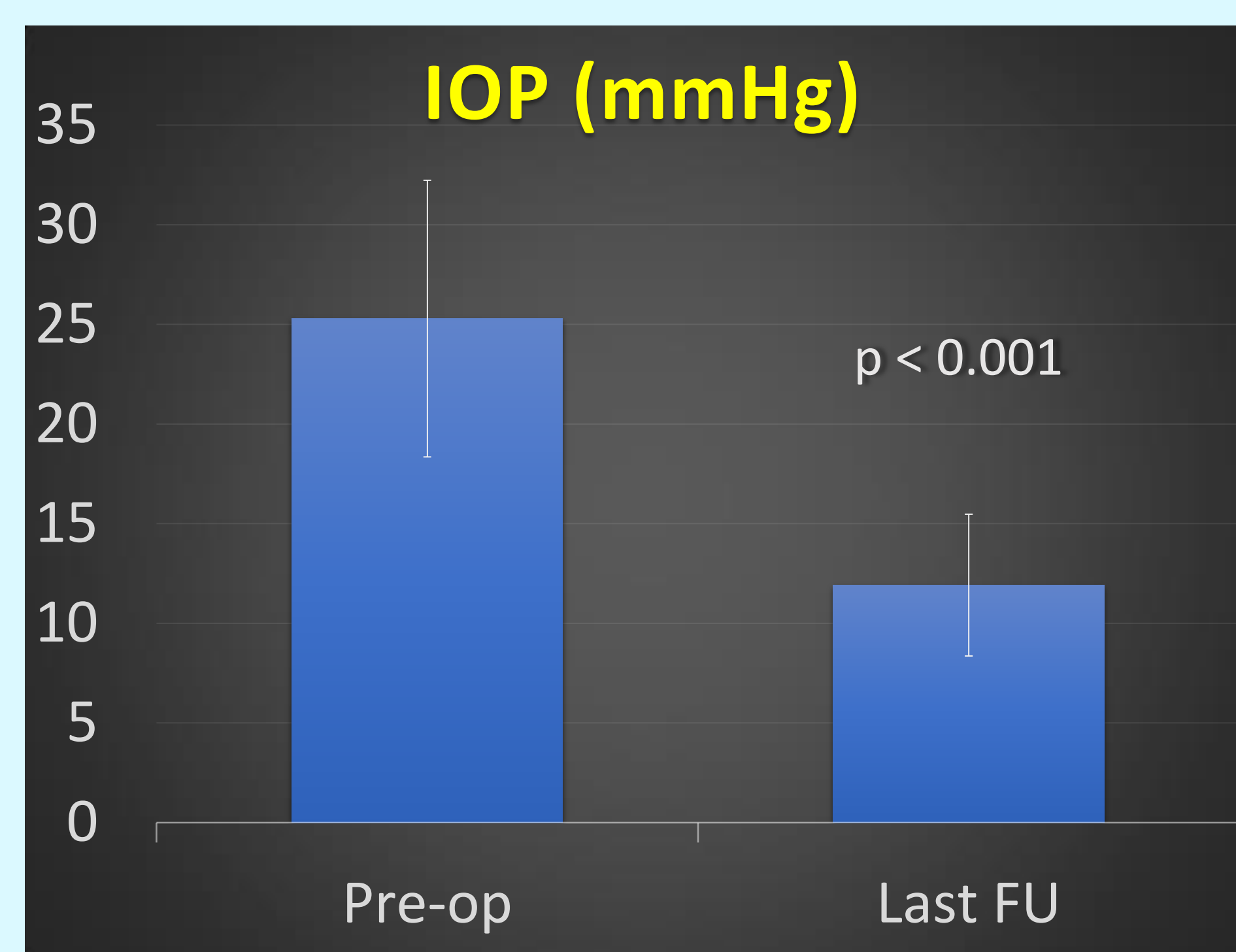


Figure 2. Mean IOP values before and after surgery (mean IOP reduction: 13,4 ± 8,5 mmHg).

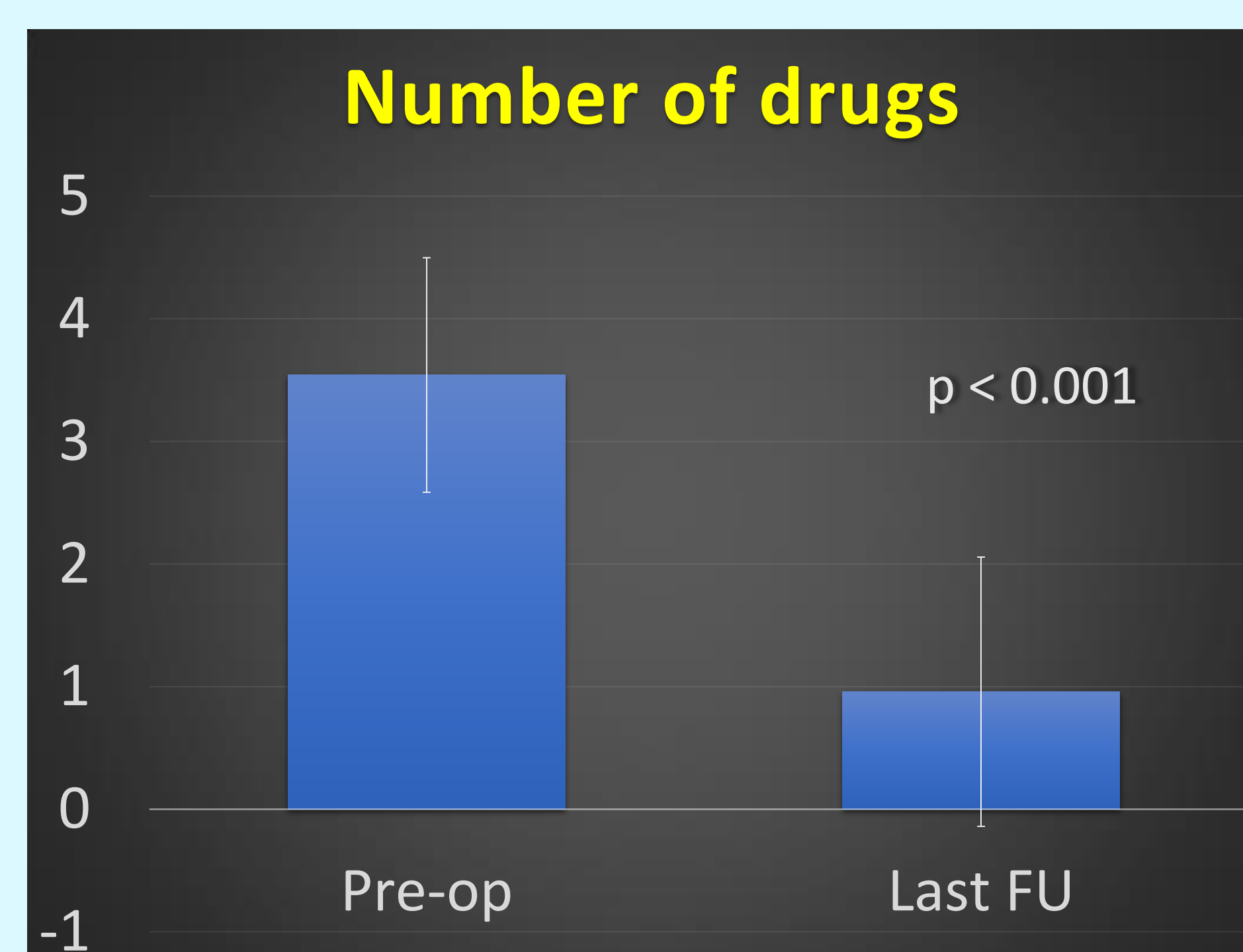


Figure 4. Mean number of medications before and after surgery.

RESULTS

The authors identified 24 eyes of 21 consecutive patients (21 POAG and 3 XFG; 11 women and 10 men) who underwent the CLASS procedure. With a follow-up time (FU) of 10.2 ± 6 months (mean ± SD), the IOP changed from 25.3 ± 6.9 mmHg preoperatively to 11.9 ± 3.6 mmHg (p<0.001) at last FU visit. Mean IOP reduction was 13,4 ± 8,5 mmHg. The number of IOP lowering drugs decreased from 3.5 ± 0.9 to 0.9 ± 1.1 (p<0.001). Overall, a total of 14 eyes (58,3%) required additional medical treatment after surgery. However, among these, 9 patients were administered only pilocarpine 2% in order to reduce the risk of iris apposition. Based on this analysis, 5 patients (20,8%) required additional hypotensive drops to achieve IOP control.

In one case, the procedure was converted to trabeculectomy due to intraoperative perforation. Seven eyes (29,2%) developed iris apposition at the trabeculo-descemetic window; this was successfully managed at the slit-lamp in 4 cases or with 2% pilocarpine and Nd:YAG laser synechiolysis (3 cases). There was one case of hypotony maculopathy that required transconjunctival flap sutures). Post-operative needling and/or flap lifting was required in 7 eyes (29,2%) and repeated 3-6 times in 4 cases.

CONCLUSIONS

Our data suggest that CLASS procedure is a safe procedure, with good early clinical outcomes. Irido-trabecular contacts warrants further evaluation and possibly reflect the surgeon's learning curve.