Conversely to trabeculectomy, deep sclerectomy does not require to penetrate the anterior chamber. Considerable technical skills are needed to preserve the integrity of the trabeculo-Descemet's membrane. Recently, a CO₂ laser with a beam-manipulating system has been developed to facilitate the surgeon to expose the Schlemm's canal reducing the risk of perforation of the TDM. Indeed, the CO₂ laser energy is promptly absorbed by the water and the effect on the tissue is halted when aqueous starts to percolate.

To evaluate the clinical and anatomical outcomes of CO₂ laser-assisted sclerectomy surgery (CLASS) for the surgical treatment of open-angle glaucoma (OAG).

After the creation of a limbus-based conjunctival flap and the dissection of a partial thickness scleral flap, topical MMC 0.2 mg/ml was applied to the sclera and the conjunctiva for 3 minutes. The CO₂ laser with a beam-manipulating system was used to ablate the scleral tissue in the bed of the dissected sclera and to expose the Schlemm's canal area till percolation of aqueous was observed. Clinical outcomes were: intraocular pressure (IOP) change, number of IOP-lowering medications change and side effects. Gonioscopy and Automatic 360 degree Gonio-Photography (AGP; Gonioscope NGS-1; Nidek Technologies srl) were used for the evaluation of the anterior chamber angle (ACA).

Twenty-four eyes of 21 consecutive patients were included in this study. With a mean (SD) follow-up of 22 (5.5) months (minimum 12 months), the IOP changed from 25.5 (7.1) mmHg at baseline to 11.9 (3.7) mmHg at the last visit. Mean reduction of IOP was -13.6 mmHg (95% CI, -17.9 to -10.7, P<0.001). The median (IQR) number of IOP-lowering medication decreased from 3 (3 - 3) at baseline to 1 (0 - 1) at the last visit (P<0.001). Visual acuity did not change significantly. In one case, CLASS was converted to trabeculectomy due to intraoperative perforation. During the follow-up, iris adhesion to the filtration area occurred in seven eyes (29%, yellow asterisk) and was managed with office-based procedures. AGP permitted to evaluate and record the position of the iris in the treated area.

Our results showed that CLASS procedure with MMC was safe and effective in drastically lowering the IOP and in reducing the requirement for IOP-lowering medications. AGP was useful for the detection of iris adhesion that represented the most frequent, though reversible, complication observed.