Multicenter clinical trial of ultrasonic circular cyclo coagulation in patients with open-angle glaucoma: one year results

Florent Aptel¹, Philippe Denis², Jean-François Rouland³, Jean-Philippe Nordmann⁴, Yves Lachkar⁵, Jean-Paul Renard⁶, Eric Sellem⁷, Christophe Baudouin⁴, Alain Bron⁸

¹University Hospital of Grenoble, Department of Ophthalmology, Grenoble - France
²Croix-Rousse University Hospital, Lyon - France
³University Hospital of Lille, Department of Ophthalmology, Lille - France
⁴Hôpital des Quinze-Vingts, Department of Ophthalmology, Paris - France
⁵Fondation Hôpital Saint-Joseph, Paris - France
⁶Hôpital d’Instruction des Armées du Val de Grâce, Paris - France
⁷Centre Ophtalmologique Kléber, Lyon - France
⁸Hôpital Général, Department of Ophthalmology, Dijon - France

Purpose: To evaluate the efficacy and safety of the Ultrasonic Circular Cyclo Coagulation (UC³) procedure with one year of follow-up.

Methods: Prospective non comparative interventional clinical study performed in 9 French glaucoma centers. Fifty-two eyes of 52 patients with open-angle glaucoma, intraocular pressure (IOP) > 21 mmHg, an average of 1.7 failed previous surgeries and an average of 3.7 hypotensive medications were insonified with a therapy probe comprising 6 piezoelectric transducers. The 6 transducers were activated, 24 patients (group 1) were treated with a 4-second exposure time for each shot and 28 patients (group 2) with a 6-second exposure time. Complete ophthalmic examinations were performed before the procedure, and at 1 day, 1 week, 1, 2, 3, 6 and 12 months after. Primary outcomes were surgical success (defined as IOP reduction from baseline ≥ 20% and IOP > 5 mmHg) at the last follow-up visit, and vision-threatening complications. Secondary outcomes were mean IOP at each follow-up visits compared to baseline, medication use, complications, and re-interventions.

Results: IOP was significantly reduced in both groups (p < 0.05), from a mean preoperative value of 30.3 ± 7.8 mmHg in group 1 and 29 ± 7.4 mmHg in group 2 to a mean value of 20.0 ± 6.9 mmHg in group 1 and 19.0 ± 6.7 mmHg in group 2 at last follow-up. Success (IOP reduction > 20%) was achieved in 63.2% of eyes in group 1 and 44% of eyes in group 2 at last follow-up. Seven patients were re-treated. No major intra- or post-operative complications occurred.

Conclusions: Ultrasonic Circular Cyclo Coagulation seems to be an effective and well-tolerated method to reduce intraocular pressure in patients with OAG. We found a lower efficacy with the higher dose.