

The efficacy of trans-scleral diode laser cyclophoto coagulation for the treatment of Glaucoma that is resistant to the conventional treatment (refractory Glaucoma).

Mustafa Tawfik al-Rubaie¹&Saif abass ALshamarti²

1 college of medicine, university of Babylon

2 college of medicine, university of Qadisiyah

Abstract:

Aim of the study:

To explore the efficacy and safety of trans-scleral diode laser cyclophotocoagulation in the treatment of refractory Glaucoma as well as its effects on intra ocular pressure IOP and pain relief.

Material & Methods:-

19 patients, 20 eyes, one of patient both eyes were treated. 10 patients having neovascular Glaucoma, 5 patients PCAG and 4 patients DOAG followed up for about 6 months.

Results:

Mean intraocular pressure (IOP) for the 20 eyes at first visit was (38.1500 ± 13.63924) mmHg reducing to (15.1000 ± 3.56740) mmHg one week later.

Conclusion:

Trans-scleral diode laser cyclophotocoagulation is a safe and convenient technique in the management of with refractory Glaucoma

Introduction: -

Refractory glaucoma is the expression used for glaucoma that challenge the conventional treatment.(1) This comprises highly tolerated management, single or more than one glaucoma surgeries in the company of antimetabolites. However, many issues lead to the failure of intraocular pressure management control at time of glaucoma control. Glaucoma is expected to turn into refractory includes neovascular, inflammatory, post retinal surgery, post traumatic. (2,3) Chronic topical medical therapy for primary open angle glaucoma or primary angle closure glaucoma is a Key for compromising the outcome in glaucoma surgery. Cyclodestructive procedures are warranted when glaucoma becomes resistant to usual therapeutic and surgical protocols. These protocols damage the non pigmented as well as pigmented epithelium of the ciliary body leading to reduce in aqueous production and therefore fall in IOP. Modality attempted for cyclodestruction is cryotherapy and laser photocoagulation of the ciliary body via energy of diverse wavelengths.(4,5) However cyclocryoablation and Nd: YAG laser cyclophotocoagulation are

frequently employed. Contact Diode laser cryoablation is rising as the chosen treatment since these cyclocryoablation and Nd: YAG laser cyclophotocoagulation are connected with higher risk of hypotony and phthisis because of excessive ciliary body destruction.(6,7) the objective of the current study was to explore the efficacy and safety of diode laser cycloablation and to achieve adequate IOP reduction and a comfortable eye.

Materials and methods

The study was conducted at the private clinic of dr.Mustafa Tawfik al-Rubaie and dr.Saif abass ALshamarti. 20 eyes of 19 patients treated between September 2013 and August 2014 with at least 6 months follow up included in the study. patient age were ranged between 60 and 65 year. Glaucoma was considered refractory if the IOP was above 21 mmHg even though all treatment options had done. Pre laser evaluation incorporated best corrected visual acuity, slit lamp biomicroscopy of the anterior and posterior segment, applanation tonometry using Goldman tonometer.

Gonioscopy has also been made in all patients. Local anesthesia in the form of peribulbar injection using 2 cc of 2% xylocaine was used in patients. Then start the laser surgery. First, procedure started giving 8-15 shoots using diode laser device manufactured by ARC laser company through a transcleral probe which is disposable probe, the need for a second session was high, then we increase the number of shoots to about 25 shoot, in the second session and for the eyes with poor vision and high IOP at presentation we use 40 shoots or what is called 9° hour treatment avoiding 3° O'clock and 9 O'clock position to save the ciliary nerves & vessels. Energy setting 2-1 week for 1 second. 3 patients need 2 sessions. Oral NSAIDS, topical dexamethasone 0.1% eyedrops along with

antiglaucoma medication except miotics were continued for the 1st week. Antiglaucoma medication was tapered in accordance with the drop in intraocular pressure. At 1 week post laser treatment oral acetazolamide was discontinued if the IOP was <22 mmHg, with reintroduction of topical IOP lowering medications at the discretion of the clinician. Topical steroids, usually dexamethasone 0.1% eye drops, were prescribed four times a day for 2-4 weeks after treatment. The patients were seen after 1 week then 1 month and then 3 months. 3 patients develop hypotony which is reversed when we stop the anti-glaucoma therapy. 5 patients stop treatment at all and the others continue on treatment but with good control of their IOP as shown in figure (1).

Figure

before Tscpc	1 week	1 month	4 month
45 (15	15	15
35	8	16	15
50)	20	22	18
37	16	18	17
40	18	16	17
40	16	16	17
40	17	17	17
35	16	15	12
55	12	30	15
60	12	30	15
44	15	17	17
33	9	15	16
35	16	14	12
4	18	17	15
45	17	18	16
5	20	19	20
50	20	18	14
40	15	17	16
37	12	14	14
33	10	15	15

Result

The RLSD (revised least significant difference) & Duncan's Multiple range test was used for statistical analysis. The results showed that there is a significant difference in IOP between the first visit and visit after one week (P value > 0.05). The mean of first visit was (38.1500 ± 13.63924) while the second visit was (15.1000 ± 3.56740) as shown in figure (2). However there are no significant difference among the second visit after one week and the visits later one (one month and 6 months). There are only two patients we have done to them second treatment after 1 month

Figure (2)

before Tscpc	1 week	1 month	4 month
38.1500 ± 13.63a	15.1000± 3.56b	17.9500±4.52b	15.6500± 1.89b

The values that carry the same letter (b) show no difference between them ($p < 0.05$)

Discussion

Diode laser cycloablation has developed an suitable pathway for the treatment of refractory glaucoma (8). It has also been attempted as a principal surgical management in diverse types of glaucoma (9). Complications profile is acceptable and most authors have reported insignificant and transient complications as pain and inflammation (10). **Ophthalmologists** are trying Contact trans-scleral laser cyclophotocoagulation treatment for refractory glaucomas as an alternative to drainage implant surgery in complex glaucomas (11). The result of current study showed that how the IOP drops following the sclera cyclophotocoagulation. However only two cases need second treatment after 1 month and only 2 cases get hypotony treated by stopping the Anti-Glaucoma and starting topical steroids, 1 patient develop uveitis that respond well to topical and oral steroids, 5 patients stop treatment at all the others get good control of their IOP using Anti-Glaucoma drugs from our experience the result of TSCP is much better than the other techniques that although may cause complete drop of IOP but cause disfiguring of the eye and hypotony. (12)

Conclusion:

TSCP safe and convenient technique especially for eyes with refractory Glaucoma and poor vision less invasive technique if compared with cryocyclo or alcohol injection even if hypotony occurs it can resolve after 1 week if we give steroid topical and stop Anti-Glaucoma.

References

1- Murphy CC, Burnett CAM, Spry PGD, et al. A two centrestudy of the dose-response relation for

transscleral diode lasercyclophotocoagulation in refractory glaucoma. *Br J Ophthalmol.* 2003; 87: 1252-7.

2- Finger PT, Smith PD, Paglione RW, et al. Transscleralmicrowave cyclodestruction. *Invest Ophthalmol Vis Sci.* 1990;31: 2151-5.

3- Kosoko O, Gaasterland DE, Pollack IP, et al. The Diode laserciliary ablation study group. Long term outcome of initialciliary ablation with contact diode laser transscleralcyclophotocoagulation for severe glaucoma. *Ophthalmology*1996; 103: 1294-1302.

4- Brown GC, Magargal LE, Schachat A, Shah H. Neovascularglaucoma. Etiologic considerations. *Ophthalmology* 1984; 91:315-320.

5- Sivak-Callcott JA, O'Day DM, Gass DM. Evidence basedrecommendations for the diagnosis and treatment ofneovascular glaucoma. *Ophthalmology* 2001; 108: 1767-1778.

6- Ohnishi Y, Ishibashi T, sagawa T. Fluoresceinangiography in diabetic neovascularization. *GraefesArch Clin Exp Ophthalmol* 1994; 232: 199-204.

7-Pastor SA, Singh K, Lee DA. Cyclophotocoagulation, a report by the American Academy of Ophthalmology. *Ophthalmology* 2001; 108: 2130-2138.

8- Atallah S, Biswas S, Artes PH Long term results of diodelaser cycloablation in complex glaucoma using the ZeissVisulas II system. *Br J Ophthalmol.* 2002; 86: 39-42.

9- Heinz C, Koch JM, Heiligenhaus A. Transscleral diode lasercyclophotocoagulation as primary surgical treatment forsecondary glaucoma in juvenile idiopathic arthritis: highfailure rate after short term follow up. *Br J Ophthalmol.* 2006;90: 737-40.

10- Brancato R, Carassa RG, Bettin P, et al. Contact transscleralcyclophotocoagulation with diode laser in refractory glaucoma. *Eur J Ophthalmol.* 1995; 5: 32-9.

11- Gupta V, Agarwal HC. Contact trans-scleral lasercyclophotocoagulation treatment for refractory glaucomas inthe Indian population. *Indian J Ophthalmol.* 2000; 48: 295-300.

12- Spencer AF, Vernon SA. "Cyclodiode": results of a standardprotocol. *Br J Ophthalmol.* 1999; 83: 311-6