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"Nd: YAGsweep": An office-based procedure to clear IOL deposits.

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Abstract
Objective: *To evaluate the efficacy of Nd: YAG laser in clearing the deposits on anterior surface of intra ocular lens(IOL).*
Methods:*Ten eyes of 10 patients who had pigment deposits on IOL post cataract surgery were included. All eyes underwent Nd YAG laser assisted sweeping of the pigments on IOL. Visual acuity, IOP and fundus examination were done pre and post procedure. All patients were started on Lotepred 0.5% in tapering dose. All patients were followed up for 3 months.*
Results: *The deposits were totally cleared in 8 patientsand partially left in 2 patients.Improvement in visual acuity ranged from 2 to 4 lines was noted in 7 cases. IOL pitting noted in 2 cases. Fundus was better evaluated in all patients after YAG sweep.*
Conclusion: *Nd YAG sweeping of the intra ocular lens surface is an effective method for clearing pigmented deposits on anterior surface of IOLs.*
Keywords: *Pigment,Cataract, Nd YAG, Sweeping, deposits, IOL*

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I. Introduction

Various intra ocular manipulations during cataract surgery and subsequent post-operative inflammation causes deposition of inflammatory cells and pigments on the surface of IOL [1]. Low-grade iritis usually exists in uneventful cataract surgeries, which is insignificant in majority of cases. This inflammation may cause severe post-operative uveitis in diabetics anduveitic eyes [2].The postoperative inflammation is severe in eyes with complicated cataracts, traumatic cataracts and followed by complicated cataract surgeries. In persistent and severe postoperative inflammation these inflammatory and pigment deposits organizes to form a membrane on the anterior surface of the IOL, decreasing visual acuity [3,4].Topical steroids are usually used to clear these deposits [5]. In cases where the deposits can't be cleared with steroids, the alternate method is polishing the anterior surface of IOL, which is invasive method, requires good skill and always carries the risk of post-operative inflammation. In order to avoid the resurgery, these Corticosteroid resistant deposits are better cleared with a non-invasive Nd YAG laser assisted sweeping of the anterior surface of IOLs [6,7]. In this study we evaluate the safety and efficacy of Nd YAG sweep for clearing the deposits on IOL.

II. Methods

Ten eyes of 10 patients who had pigment deposits on IOL post cataract surgery were included. All eyes underwent Nd YAG laser assisted sweeping of the pigments on IOL.Visual acuity by Snellen chart, IOP measurement by applanation tonometry, slit lamp examination and posterior segment examination were performed before and after Nd: YAG sweep in all patients.

Technique of Nd YAG sweeping: After dilating the patient's eyes with tropicamide plus(0.8%tropicamide and 5% phenylephrine Hydrochloride), the laser aiming beam was defocused just anterior to the pigment deposit and laser was applied. The energy of laser beam was from the lowest energy of 0.5 mJand number of shots were from 4 to 12 depending on the density of pigments. This is an indirect method which prevents the damage to IOL optic[7].

Following the procedure, low dose steroids (Loteprednol 0.5%)were advised to all the patients in tapering doses.Patients were reviewed at 1 week,1month and 3 months.
The details of the 10 patients were mentioned in table1.

III. Results

Out of10 patients who underwent Nd YAG sweep, 6 patients were males and 4 were females.The age of the patients ranged between 45 to 65 years.Intra ocular lens surface deposits were noted in all patients with mean duration of 6.3 months following cataract surgery.The deposits on the surface of IOLs were varying from variously sized chunks of pigments to thin membranous deposits.Out of 10 patients,pigments were totally dispersed in 8 patients and they were partially left in 2 patients.Posterior segment was better evaluated in 8 patients as the removal of pigments made its view clear.Improvement in visual acuity was noted in 7 patients by 2 to 4 lines.In other 3 patients, not much improvement is noted due to pre-existing posterior segment pathology.Partial recurrence of pigment deposits was noted in 2 cases in 3 months follow up after YAG sweep.

The results are tabulated and shown in table 2.
The pre and post YAG sweep images ofIOL with pigment deposits of a patient have been attachedas figure (1a and 1b).

IV. Discussion

Intra ocular manipulations during cataract surgery can result in breakdown in blood-aqueous barrier which leads to the deposition of free-floating erythrocytes, acute inflammatory cells, pigments and other proteinaceous materials[5,8].When there is persistent on-going inflammation, these inflammatory debris organizes to form a membrane on the surface ofIOL[5,7].

Yamanaka et al found cellular deposits on surface of IOL in eyes following uneventful cataract surgeries in small numbers immediately after surgery and also found that these tended to disappear after 3 months[9].This deposition of either pigments or membrane over the surface of IOL hinders the visual acuity of the patients necessitating the therapeutic measures.

In case with low grade inflammation the surface deposits usually resorbed spontaneously when the inflammation subsides[5].Corticosteroids accelerates the resorption of these surface deposits.But, in cases with persistent /untreated inflammation, even corticosteroids fail to accelerate the resorption of surface deposits and membranes on the IOLs, which necessitates the need of alternate therapies.That was the presentation when most of our patients visited to us where steroids did not clear the deposits over the surface of IOLs.In all patients inflammation seems to be the common cause which could be due to noncompliance and lack of proper follow up after cataract surgery.These patients presented to us when there was a significant drop in visual acuity and the anterior surface of IOLs of all showed small chunks of pigments to organized membranes.

Noris et al first mentioned about the Nd YAG laser therapy to disrupt the un-resolving membrane on the surface of IOL. He used high energy of laser and aimed directly at the inflammatory membrane in the early and intermediate post-operative period[6].IOL pitting was the most common complication with this direct method of Nd YAG laser to sweep the deposits on IOL.

Rasik B Vajpayee et al, mentioned about 11 patients with surface deposits on IOLs which were swept with indirect technique of Nd YAG sweep in their study. The laser beam created an aqueous shock wave due to anterior defocussing of the beam, which swept the pigments on the IOL.They noted 1 to 3 lines of visual improvement post laserin all their 11 patients[7].

We followed the same method as mentioned by Rasik B Vajpayee et al for clearing the surface deposits on IOL of 10 patients.IOL pitting was noted in 2 cases.

The literature on Nd YAG sweep for clearing the IOL deposits is sparse. It is safe, easy, effective and simple OP procedure for clearing the deposits on anterior surface of IOLs.It can be done by any ophthalmologistbecause of its low learning curve, so that all patients can benefit.

V. Conclusion

Nd YAG sweep is effective in dispersing the inflammatory pigments from the anterior surface of IOL, which facilitates the clear view of posterior segment examination and also improves the patient's visual acuity.Using low power energy during the Nd YAG sweep can prevent the IOL damage.

References

[1]. Eifzig DE. Deposits on the surface of the intra ocular lens: a pathologic study. South Med J 1986; 73:6-8.
[2]. Ferguson VMG, Spalton DJ. Recovery of the blood aqueous barrier after cataract surgery. Br J Ophthalmol 1991; 75:106-110.
[3]. Nishi O. Fibrinous membrane formation on the posterior chamber lens during the early post-operative period. J Cataract Refract Surg. 1988; 14:73-77.
[4]. Miyake K, Maekubo K, Miyake Y et al, Pupillary fibrin membrane; a frequent early complication after posterior chamber lens implantation in Japan. Ophthalmology 1989; 96:1228-1233.

[5]. Apple DJ, Mamalis N, Loftfield K et al. Complications of intra ocular lenses, a historical and histopathological reviews. Surv Ophthalmol. 1984; 29:1-53
[6]. Noris WJ, Chizls IA, Santry GJ, et al Severe fibrinous reaction after cataract and intra ocular lens implantation surgery requiring neodymium:YAG laser therapy. J Cataract Refract Surg. 1990; 16:637-639
[7]. Vajpayee RB, Angra SK et al. Nd: YAG sweeping—an indirect technique for clearing intra ocular lens deposits. Ophthalmic Surg. 1993 jul:24(7):489-91
[8]. Wolter JR. Foreign body giant cells on intra ocular lens implants. Graefes Arch Clin Exp Ophthalmol.1988;219;103-111
[9]. Yamanaka A, Kazusa R, Takayama S. cells on the various kinds of intra ocular implants. Eur J Implant refract Surg 1989; 1:15-17

		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10
Age/sex		45/F	57/F	59/M	65/M	50/F	57/M	56/M	60/M	57/M	56/F
Diagnosis		LE-Sclero-corneal tear repair with secondary IOL	RE-Traumatic catarract	RE-s/p complicated cataract surgery	RE-s/p complicated cataract surgery + resolving endophthalmitis s/p vitrectomy	RE-s/p complicated cataract surgery resolving endophthalmitis and s/p core vitrectomy	LE-Recurrent post op uveitis; BE Moderate NPDR; LE-DME	RE-Post op recurrent uveitis with vitritis	LE-Recurrent post op uveitis	RE-s/p vitrectomy for vitritis + peripapillary CNVM	LE-s/p vitrectomy and recurrent uveitis with vitritis
Pre yag VA		1/60	6/18P	6/18P	6/60	6/60	6/60	6/60	6/36	1/60	3/60
Examination	Anterior segment	Corneal edema Traumatic mydriasis PD over SFIOL	Patent PI PD+ over IOL Iris claw	Patent PI PD+ over IOL Iris claw	s/p PCR PD and thin membrane over PCIOL PMMA IOL in sulcus	s/p PCR Uveitis+ PD+ over IOL PMMA in sulcus	Uveitis +Irregular pupil Posterior synechie PD+ over IOL PMMA IOL in bag	Post. synechiae PD+ over IOL Foldable IOL	PD+ over IOL Foldable IOL	Post. synechiae PD+ over IOL PMMA IOL in bag	Post.synechiaePD+ over IOL Foldable IOL
	Post. segment	Hazy view	Normal	Dry AMD	Hazy view	DME	CSME+ ERM	Hazy view	Normal	Peripapillary CNVM	CME

Table I: Details of patients before YAG sweep

	Pre YAG VA	Post YAG VA	Post YAG IOP	Post seg pathology	Status of PD on IOL after YAG	Recurrence of PD	IOL pitting
Case no 1	1/60	6/24	20	Resolving CSME	Dispersed	No	Nil
Case no 2	6/18P	6/9	18	Normal	Dispersed	No	Nil
Case no 3	6/18P	6/18	14	Dry AMD	Dispersed	No	Nil
Case no 4	6/60	6/36	20	CME+ERM	dispersed	No	Nil
Case no 5	6/60	6/18	16	Normal	Dispersed	No	Nil
Case no 6	6/60	6/60	18	CSME+ERM	Partially left	Partially recurred	I spot pitting
Case no 7	6/60	6/12	12	Normal	Dispersed	No	I spot pitting
Case no 8	6/36	6/9	16	Normal	Dispersed	No	Nil
Case no 9	1/60	6/60	12	Peripapillary CNVM	Partially left	Partially recurred	Nil
Case no 10	3/60	6/36	14	CME	Dispersed	No	Nil

Tab II: Results after Nd YAG sweep

Image 1a and 1b: Before and after YAG sweep in 65/M patient with s/p complicated cataract surgery (case 4)

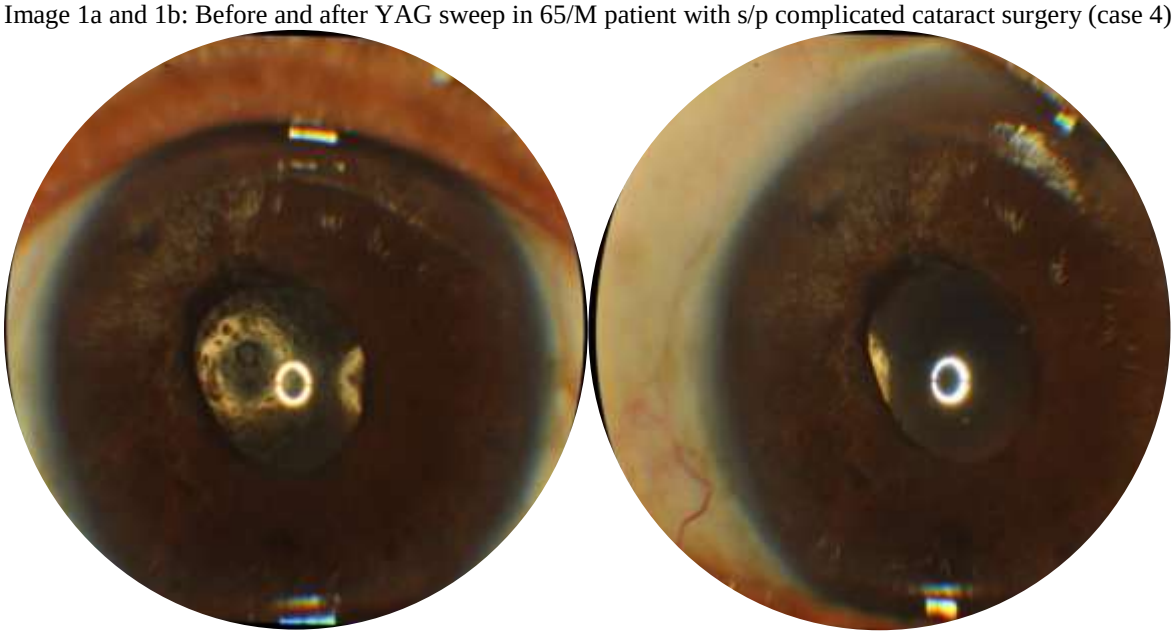

Image 1a: before YAG sweep

Image 1b: after YAG sweep

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