



Lens Extraction for Primary Angle Closure Glaucoma A Case Series

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ABSTRACT

Introduction: The role of lens in pathogenesis of ACG is established. Clear lens extraction by phacoemulsification (PE) in primary angle closure glaucoma (PACG) may be considered the most logical therapeutic option. Based on the benefits of this minimally invasive procedure we present our indigenous data. **Aims & Objectives:** To observe the effect of lens extraction in cases of primary angle closure glaucoma (PACG). **Place and duration of study:** Al-khidmat Teaching hospital, Mansoorah and Lahore General Hospital, Lahore from July 2014 to June 2017. **Material & Methods:** This observational case series study reports therapy instituted to 8 symptomatic patients, 4 of whom presented with bilateral and 4 unilateral PACG. Their intraocular pressure (IOP) was controlled initially with systemic IOP lowering agents such as mannitol, acetazolamide and topical pilocarpine. Four to six weeks after the PACG attack these patients were treated with lens extraction in case of both clear as well as early cataractous lenses. **Results:** One year follow up in all cases revealed no attack of acute angle closure glaucoma and their postoperative IOP was well within normal limits with an average of 13.4 ± 1.5 mmHg without any anti-glaucoma medications. **Conclusion:** All patients in our case series had normal intraocular pressure during follow up. Clear lens extraction performed earlier has good results in preventing further attacks of ACG in our population. However larger numbers of cases are required to further confirm this method.

Key words: PACG (Primary Angle closure glaucoma), YAG (Yttrium Aluminium Garnet) laser iridotomy, CLE (Clear lens extraction), PE (Phacoemulsification).

INTRODUCTION

Glaucoma is the second most common cause of visual disability in world while cataract is the commonest cause.¹ Half of the blindness from glaucoma in the world is estimated to be caused by ACG in which bilateral blindness has also been reported.² PACG is more common in Asian population. The number of glaucoma patients is increasing in the world. It is estimated to be 76 million by 2020 of which 23 million will be of PACG.³⁻⁴ Shallow anterior chamber is a characteristic of PACG. Lenses are thick in these eyes. Deepening of anterior chamber occurs with lens extraction and timely control of attack of ACG is important to save the vision. Recurrent attacks may lead to severe visual deterioration and

permanent rise of intraocular pressure due to formation of peripheral anterior synechiae. The conventional treatment involves control of IOP with systemic and topical anti glaucoma medicines followed by YAG laser peripheral iridotomy when corneal edema and inflammation subsides. The aim of treatment in acute cases of PACG is to alleviate pain, control IOP to reduce the risk of damage to optic nerve head and to prevent the recurrent attacks so as to prevent the progression of disease to chronic ACG.⁵

Trabeculectomy at time was the main treatment option to control IOP in patients with glaucoma, whether it was open angle or closed angle glaucoma. In PACG it is a fact and need not to be proven again that the lens, cataractous or clear, is involved in pathogenesis because of its thickness that increases with age.⁶ Lens extraction theoretically should eliminate this anatomical factor

predisposing to ACG.⁷ Moreover reduction of IOP after cataract extraction is observed by many observers whether the eyes are normal or glaucomatous.⁸ Hence lens extraction by increasing the depth of anterior chamber reverses this anatomical factor involved in PACG.^{9,10} This fact is taken into account in our study and in most of the studies abroad.^{11,12,13} As searched on Pakmedinet, this study has not been done before in our country.

CASE STUDIES

Twelve cases of PACG were studied over a three years period with age range of 48-62 years with an average of 54.5±5.15 years. Cases were treated at AKTH & at LGH Lahore. Acute attack of PACG was managed with systemic treatment i.e. mannitol i.v. and acetazolamide orally with topical pilocarpine. After history and slit lamp examination, gonioscopy was performed in every case before deciding for surgery. Secondary cause of angle closure such as phacomorphic glaucoma was ruled out in all cases. They were operated 4-6 weeks after the acute attack when the signs such as corneal edema, redness disappeared and IOP had normalized with medications. In the interval between acute attack and surgery IOP was controlled with pilocarpine and beta blockers and if necessary oral acetazolamide for short period. Pilocarpine drops were stopped a day before the surgery and oral acetazolamide started in every case.

Presence of peripheral anterior synechiae was ruled out with gonioscopy.

Routine phacoemulsification (PE) with intraocular lens implant was carried out in all cases. All patients were operated under topical anesthesia and i.v mannitol was given to them before surgery in a dose of 1mg/Kg body weight. Their pre-operative and post-operative IOP was recorded at initial and each follow up visit. Patients were advised follow up after every three months for a year.

RESULTS

The mean pre-operative IOP at presentation was 44.6±7.06mmHg and post-operatively after two weeks was 15.2±2.5mmHg and at one year was 13.4±1.5mmHg.

Postoperatively clear lenses were seen in eight eyes and minor lens opacities in the remaining four eyes. Two cases had previous YAG iridotmy performed elsewhere and presented to us with ACG. The best corrected pre-operative visual acuity ranged from 0.1 to 0.6 with an average of 0.32±0.2 at presentation while post-operative visual acuity was 0.8 to 1.0 with an average of 0.87±0.09.

Follow up of patients was done after every three months for one year. All the cases remained normal post operatively without any glaucoma medications or other surgical procedure as they did not have any episode of ACG afterward and their IOP remained within normal limits. Results are shown in Table-1.

Cases	Age in years & sex	PRE-OP VA at presentation	POST-OP VA at 3m	IOP at Presentation mmHg	PRE-OP IOP	POST-OP IOP at 2w	POST-OP IOP at 3m	POST-OP IOP at 6m	POST-OP IOP at 1 yr
1	54F	0.1	0.8	45	18	15	17	16	15
2	58M	0.1	0.8	43	20	16	15	14	16
3	48F	0.4	1.0	34	16	17	16	18	16
4	54F	0.6	1.0	48	14	15	14	12	11
5	61F	0.1	1.0	56	18	14	12	14	12
6	50M	0.4	0.8	44	16	16	14	15	15
7	61F	0.6	1.0	48	20	16	15	17	14
8	46F	0.2	1.0	46	18	14	15	14	15
9	58M	0.6	1.0	52	14	12	14	12	14
10	50M	0.4	0.8	38	16	14	16	18	15
11	52M	0.4	1.0	46	12	16	14	15	14
12	62F	0.1	1.0	36	14	16	14	16	16
MEAN	54.5±	0.32	0.87	44.6	15.2	14.0	13.6	14.0	13.4
SD	5.15	±0.2	±0.09	±7.06	±2.5	±1.3	±1.3	±2	±1.5

Table-1: Table showing data of all patients

DISCUSSION

Primary angle closure glaucoma (PACG) is a major cause of blindness especially in Asians.¹⁴ Iridolenticular contact causes pupil block and aqueous accumulation in posterior chamber, leading to bulging of peripheral iris. This causes appositional closure of angle at first and if not treated appropriately and timely will lead to synechial closure of angle. Although YAG laser iridotomy relieves angle blockage but quite a large number still need other surgical procedures such as peripheral iridectomy. The increasing lens vault overtime leads to re-closure of the angle and failure of YAG laser iridotomy.^{15,16,17} PACG lens extraction therefore seems to be a useful alternate procedure. Even persistent rise of IOP after laser iridotomy was treated with clear lens extraction in a study and the results showed a decrease in the need of anti-glaucoma medications. Absolute success was achieved in 86.3% of cases in this study.¹⁸ Debate is still going on this subject and clear lens extraction seems to be a successful procedure.^{19,20,21}

One of the studies at Nepal showed a very high failure rate of 22% of YAG PI in patients of PACG. Trabeculectomy was needed in these patients, which has more chances of complication during and after operation.²² Performing clear lens extraction by PE earlier would have been a better option. Another study at Iran also shows similar results in which comparison was done and patients treated with PE were better as compared to patients treated with YAG PI.²³ Another study conducted at Singapore national eye center also shows a high success rate in PE group as compared to YAG PI group. There were more failures in the YAG PI group (38.9%) compared with the PE group (10.5%). There were 7(out of 18) failures in the LPI group, which was considerably higher than in the phaco/IOL group (2/19). Furthermore, 6 of 7 subjects (86%) in the LPI group with failed procedures had to undergo further surgery, specifically phacotrabeculectomy with mitomycin-C to control IOP.²⁴

Our study has limitations regarding number of cases but we hope that in our population similar results are expected in large number of cases. We limited our study to cases of acute PACG having appositional closure only or peripheral anterior synechia involving less than 1/3rd of angle. Again this limitation leads to good post-operative results. Although standard treatment is YAG iridotomy but

quite a number of patients later develop asymptomatic IOP elevation leading to visual loss especially in Asians.¹⁵ Many of these patients shortly develop cataract because of treatment or disease itself and need cataract extraction. So early lens extraction is advisable. With advances in PE better visual results are now possible.²⁵

CONCLUSION

This unique local study on early cases of symptomatically treated PACG patients suggests clear lens extraction (CLE) by phacoemulsification (PE) to be preferable, safe and suitable procedure not requiring any further intervention as compared to peripheral iridotomy.

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