MANAGEMENT OF CONCURRENT GLAUCOMA AND CATARACT BY PHACOTRABECULECTOMY TECHNIQUE : AN EFFECTIVE ALTERNATIVE APPROACH

Lt Col JKS PARIHAR^{*}, Brig RG DASH^{vsm⁺},
Col DP VATS^{vsm[#]}, Lt Gen SC VERMA (Retd)^{psvm,phs^{**}}
Col PK SAHOO⁺⁺, Lt Col FEA RODRIGUES^{##}
Lt Col AP KAMATH^{##}

Abstract

30 cases of open angle glaucoma with cataract who underwent phacoemulsification, PMMA phaco profile IOL implantation and trabeculectomy through same incision were critically evaluated. The mean controlled, preoperative intra ocular pressure was 20 mm of Hg (range 18 to 35 mm of Hg) by aplanation method. Mean post operative pressure after 12 months was 13 mm of Hg (range 11 to 22 mm of Hg) intra operative hyphaema, post operative uveitis were noted problems. Periodic, post operative optic disc and field evaluation remained static in 66% cases. Visual acuity of 6/12 or better was achieved in 60% cases. Failure to restore glaucoma control without medication was seen in 13.3% cases after 9-12 months. The combined phacotrabeculectomy is an effective single step technique of managing concurrent glaucoma with cataract.

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Introduction

Trabeculectomy to reduce intra ocular pressure (IOP) in primary open angle glaucoma (POAG) has been in practice for more than three decades [1]. However presence of concomitant glaucoma and cataract remains a challenge to the ophthalmic surgeons despite the trend of performing combined trabeculectomy and conventional extra capsular cataract extraction in recent past [2]. However, in such a procedure serious complications like expulsive choroidal haemorrhage and post operative hyphaema can occur. Considering the safety and efficacy of closed chamber surgery for cataract it is quite logical to try this procedure in such cases. With the advent of small incision phacoemulsification surgery, which is the most advanced form of closed chamber cataract surgery, it is logical to try a combined technique of trabeculectomy and phacoemulsification for patients suffering from glaucoma with cataract. A few workers have tried out such a combined surgical procedure and their results have been somewhat inconclusive [3]. An attempt is made in this study to evaluate the efficacy of single incision trabeculectomy with phacoemulsification and posterior chamber intra ocular lens implantation in terms of control of glaucoma as well as satisfactory sight restoration.

Material and Methods

30 eyes of 26 consecutive cases of primary open angle glaucoma with co-existing cataract were selected for combined surgical treatment in this study. Mean age of 11 male and 15 female patients was 50 years. All these cases were operated in a span of 8 months, post operative follow up in all these cases ranged from 12 to 18 months. Complicated cases who had corneal disorders, uveitis, chorioretinal involvements and trauma in addition to cataract and glaucoma were not included in this study. All patients were subjected to thorough preoperative ocular examination. The ophthalmic evaluation included recording visual acuity, anterior segment biomicroscopy, gonioscopy, visual field recording, fundus examination and where possible, intraocular pressure in resting state and with anti glaucoma drugs.

Surgery was performed under local anaesthesia administered by peribulbar technique using 2% lignocaine and 0.5% bupivacaine injections. A 5.25 mm wide self sealing short sclerocorneal tunnel with a 3 mm shelving valve placed 1.5 mm posterior to the limbus was made. 1 mm side port incision was made about 4 mm to the left of the main tunnel. Hydroxy propyl methyl cellulose 2% solution was injected into the anterior chamber to make the anterior chamber deep and to protect corneal endothelium throughout the surgical procedure. A 4.5 to 5.0 mm diameter sized continuous curvilinear capsulorhexis over the centre of the anterior lens capsule was made with a cystitome made by bending a 26 gauze hypodermic needle.

Hydrodissection was done, by injecting Ringer lactate solution under the anterior capsular flap from a 2 ml syringe using a 26 gauze cannula. Now the lens nucleus became free for rotation within the capsular bag and phacoemulsification tip along with its sleeve was introduced into the anterior chamber to perform nu-

^{*}Reader, ⁺⁺Professor and Head, ^{##}Associate Professor, Department of Ophthalmology, Armed Forces Medical College, Pune - 411 040. ^{**}Ex Director General Medical Services (Army). ⁺Consultant Ophthalmology, Army Hospital (R&R), Delhi Cantt. [#]Senior Advisor (Ophthalmology), Command Hospital (West Command), Chandimandir.

cleotomy by sculpting the nucleus and breaking it into multiple fragments and then removed in pieces. Residual cortex was removed with the help of irrigation and aspiration technique using the conventional simcoe cannula. A 5.25 mm optic phaco profile PMMA intra ocular lens was then implanted in the capsular bag. After proper placement of the intraocular lens, the pupil was constricted using diluted intracameral pilocarpine solution. Then a piece of 1.5x3.5 mm size block of tissue involving trabecular mesh work along with overlying corneo-scleral lip was excised from the corneo scleral tunnel incision covering either side of the incision thus leaving intact the anterior corneal self sealing lip. A peripheral button hole iridectomy was performed at about 11 or 1'O clock meridian. Anterior chamber was reformed with the help of Ringer lactate or balanced salt solution. Corneo scleral tunnel incision was hydrated by intrastromal infiltration of Ringer lactate solution and no suture was used. The conjunctival flap was approximated upto the limbus and fixed by application of bipolar cautery. Periodic, regular follow up was done at weekly intervals for a month and then at monthly intervals upto 12 to 18 months. Post operative evaluation was based on the status of visual acuity, intra ocular pressure, optic disc and other fundus changes as well as on detection of any post operative complications.

Success of the combined procedure was assessed after the final follow up based on the control of IOP without anti glaucoma drug therapy and restoration of effective sight that was blocked by cataract.

Results

We report on 30 consecutive eyes of 26 patients operated by the above method all with 12 to 18 months follow up. Average controlled pre operative intra ocular pressure was 22 mm of Hg (range 18 to 35 mm of Hg). Pre operative visual acuity was ranging from counting finger close to the face up to 6/24. Gonioscopic examination had confirmed that the angle of anterior chamber had grade three to four opening in all cases. Maximum preoperative pupillary dilation affected by mydriatic agents was 5 to 6.5 mm. Operative procedures were uneventful though considerable difficulty was faced by the surgeon to maintain sustained pupillary dilation of more than 5 mm during surgery in 7 (23.33%) eyes.

Phacoemulsification time ranged between two to three minutes and fifteen seconds in all but 1 case of suprachard nucleus where it extended up to 4 minutes and 30 seconds. Post operative intra ocular pressure (IOP) was as low as 7-10 mm of Hg in 24 (80%) eyes after first week of the surgery and followed with gradual rise to 11-14 Hg in 22 (73.33%) cases after a period of 2-3 months (Table-1). However ultimate results 18 months after surgery had revealed further rise of IOP up to 15-20 mm of Hg in 12 (40%) cases (Table-1), 6 cases (20%) required topical administration of Beta-Blockers (0.5% Timolol maleate 12 hourly) to maintain intra ocular pressure at the desired level. Examination of visual field and fundus showed no further deterioration after surgery in 24 (80%) cases even after 12 to 18 months of follow up. However the field defect and optic disc cupping worsened in 6 (20%) cases despite adequate control of IOP (Table-2). 19 eyes (63.33%) had attained visual acuity of 6/12 or better, where as 3 eyes (10%) had very poor visual outcome due to post operative complications or advanced glaucomatous changes. Remaining cases had visual acuity ranging between 6/18 to 6/24 (Table-4). Most of the patients did not have any early post operative complication. Hyphaema and significant striate keratitis was visible in 1 and 2 cases respectively (Table-3) which cleared within one week.

Another noted complication was moderate to severe uveitis and fibrin deposits over anterior surface of IOL in 3 cases (10%) which

TABLE 1

Sequential changes in post operative IOP after phacotrabeculectomy with PC IOL implantation

Duration	7-10 mm	IOP (mm of Hg)		More than 20 mm (No drug)
		11-14 mm	15-20 mm	
1 week	24 (80%)	4 (13.34%)	2 (6.66%)	-
1-2 weeks	18 (60%)	10 (32.33%)	2 (6.66%)	-
3-4 weeks	10 (33.33%)	17 (56.66%)	3 (10.0%)	-
3-6 months	1 (3.33%)	22 (73.33%)	7 (23.33%)	-
6-12 months	-	18 (60%)	8 (26.66%)	4 (13.34%)
12-18 months	-	16 (53.33%)	12 (40%)	2

TABLE 2

Phacotrabeculectomy : Fields and fundus status

Post op duration	Static	Progressive changes
1-2 month	30	Nil
3-6 months	28	2 (6.66%)
Upto - 9 months	26	4 (13.33%)
12-18 months	24	6 (20%)

TABLE 3

Phacotrabeculectomy : Post operative complications

Complications	Onset / duration	No. (%)
Hyphaema	2 days	2 (6.66%)
Significant striate	2-7 days	1 (3.33%)
Shallow AC	1-7 days	2 (6.66%)
Uveitis	2-14 days	3 (10%)
Fibrous deposits over IOL	3-14 days	2 (6.66%)
Uncontrolled glaucoma	9-12 months	4 (13.33%)
(Without medication)	12-18 months	2 (6.66%)
Posterior capsule opacification	12 months	6 (20%)

TABLE 4

Phacotrabeculectomy : Visual acuity (corrected) (After six months)

Visual acuity	No.	%
6/12 or better	19	63.33
6/12 - 6/18	5	16.66
6/18 - 6/24	3	10
Less than 6/36	3	10

responded to management. Evidence of posterior capsule opacification was noted in 6(20%) cases within the period of one year (Table-3).

Discussion

Trabeculectomy is a well accepted filtration procedure for the management of primary open angle glaucoma [1,2]. However a standard protocol in the management of concurrent glaucoma and cataract still remains controversial. Two stage surgery first for glaucoma and then cataract exposes the eye in question to the risk of greater amount of endothelial cell loss and the filtering bleb of glaucoma surgery may

present problems during cataract surgery or may become nonfunctional after surgery. Hence in recent past, there has been a trend to combine trabeculectomy with extra capsular lens extraction and posterior chamber intraocular lens implantation in one sitting using a common incision or two separate incisions [2,3]. Though, these techniques have been found to be effective in terms of control of intraocular pressure and visual rehabilitation to some extent, the 8 to 9 mm size conventional incision for cataract surgery is not free from the risk of excessive post operative inflammation, sub conjunctival fibrosis and ultimate effect on patency of filtration bleb [3,4]. Another drawback is prolonged period of visual rehabilitation due to significant post operative astigmatism and its delayed stabilization [2,3]. Thus combining phacoemulsification with trabeculectomy should provide effective alternative approach which could be done either as two port phacoemulsification followed by trabeculectomy or single port phacoemulsification followed by trabeculectomy through the same incision [5]. In our study we preferred single site phacotrabeculectomy to minimise post operative inflammation and sub conjunctival fibrosis [4]. The result of our initial 2 cases had revealed early rise of post operative intra ocular pressure despite excision of an optimum size trabecular mesh work. These cases showed a very insignificant sized bleb formation probably due to tight sclero-corneal incision closure by a single horizontal suture. However better control of intra ocular pressure could be achieved after removal of this horizontal suture after 2 weeks of surgery which was probably obstructing proper functioning of filtering bleb. Other workers have also advocated placement of releasable scleral suture or no suture at all [5-8]. Subsequent modification in surgical procedure has been creation of intra tunnel sub scleral cleavage while fashioning scleral pocket incision followed by phacoemulsification and excision of trabecular mesh work along with inner half of posterior scleral lip and leaving external tunnel without any suture. This had shown improved control of glaucoma. In our view, this cleavage plane remained a key factor to maintain proper configuration of anterior chamber while retaining external structural integrity of external tunnel despite excision of trabecular mesh work. By this modification, we could retain merits of small incision cataract surgery and glaucoma control as simultaneous measures. In our study, we had encountered few early post operative complications like significant striate keratopathy, hypotony and moderate uveitis which were recorded in less than 10% cases. However, these complications were man-

aged effectively. Pattern of post operative intra ocular pressure had shown gradual rise from initial 7-11 mm of Hg to 11-14 mm of Hg in 53.33% cases and 15-20 mm of Hg in 26.66% cases after 18 months of follow up. It is worth mentioning that overall effective lowering of intraocular pressure from that of preoperative level ranged between 15-25 mm of Hg. The cases who had IOP higher than 20 mm Hg after 12 to 18 months of follow up were the ones who had very high preoperative intraocular pressure (more than 35 mm of Hg). Though the pressure lowering effect of this surgical procedure has been gratifying in the followup upto 18 months, the final results of long term follow up (5 years or more) cannot be predicted at present.

Despite combined glaucoma and cataract surgery and observing a significant bleb formation, we did not notice any undue induction of astigmatism as compared to standard small incision phacoemulsification surgery in our hands. Visual rehabilitation was prompt and effective. Poor visual outcome in certain cases was attributed to pre-existing glaucomatous damage to the optic nerve head.

Based on the encouraging initial results of single site phacotrabeculectomy with intraocular lens implantation, we recommend this procedure as an effective and improved way of management of concurrent glaucoma and cataract.

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