ORIGINAL ARTICLE

IMMEDIATE AND EARLY POST OPERATIVE COMPLICATIONS OF TRABECULECTOMY IN A TERTIARY CARE CENTRE

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ABSTRACT: OBJECTIVE: To assess the incidence of immediate and early postoperative complications following trabeculectomy, in a tertiary care Centre. **MATERIALS AND METHODS:** This was a retrospective study of complications, in a case series 366 patients, who underwent trabeculectomy with or without MMC at a tertiary Centre from January 2013-January 2015. 292 cases were operated without MMC and 74 cases with MMC. **RESULTS:** Of the, 366 case series, 63 cases (17.2%) had complications. Among it, High IOP was seen in 29 cases (46%), Shallow AC with Seidel's positive in 12 cases (19.04%) and Seidel's negative in 6 cases (9.52%), Severe reaction in the post-operative period in 9 cases (14.28%), PC rent intraoperatively in 3 cases (4.8%) and Encapsulated Bleb in 3 cases (4.8%). Out of 63 cases with complications, 17 cases (26.98%) were with MMC and 46 cases (73.01%) were without MMC.
KEYMESSAGE: The main complication in the study was High IOP. The rate of complications were found to be less in cases with MMC, suggesting that, the main complication recorded in the study was High IOP. The other complication of shallow anterior, can be managed well, conservatively and surgically. Hence, augmented trabeculectomy with MMC, can be successfully used in less favourable cases of uncontrolled glaucoma.
KEYWORDS: Trabeculectomy, MMC, Complications.

INTRODUCTION: Trabeculectomy, reported by Cairns in 1968, still remains as the gold standard surgical procedure in glaucoma for reducing the intraocular pressure.[1,2] It aims at protecting the optic nerve and preserving the visual function, by addressing the only modifiable risk factor IOP. Despite advances in antiglaucoma medications, a significant number of patients still require an intervention in the mode of surgery. Primary trabeculectomies have a reported success rate that range from 67% to 84%.[3,4] In trabeculectomy, the trabecular meshwork is excised and a fistula is created through which, aqueous humour can drain from the anterior chamber and it is accumulated in the subconjunctival space or subtenon's space forming a filtering bleb. A functioning bleb has subepithelial clear spaces with microcystic accumulation of aqueous humour.

The ocular tissues have a good healing, after any tissue injury which is very much desirable. As compared to other procedures, in filtering surgery, the wound healing can lead to episcleral fibroproliferation which can result in a bleb failure, decreasing the success rates of trabeculectomy.[5,6,7] To maximize the outcome of trabeculectomy, it is better to selectively inhibit the healing process in scleral and episcleral tissue, while leaving conjunctival wound healing intact. The introduction of adjunctive antimetabolites, like 5 –fluorouracil (5-FU) and mitomycin –C(MMC) has improved the results of filtering surgeries in less favourable cases.[8,9,10,11] Intra

operative application of MMC, was first used by Chen in 1981, and it gained popularity by 1990. However, trabeculectomy like any other surgery is also fraught with many complications.[12,13] During the first few days or weeks after trabeculectomy, the most common complications are IOP's that are too low or too high. The anterior chamber may be shallow or flat or deep. Other early post-operative complications are an encapsulated failing bleb, uveitis and loss of central vision and ocular decompression retinopathy. The purpose of our study was to assess the incidence of early post-operative complications in trabeculectomy patients in a tertiary Centre.

MATERIALS AND METHODS: This was a retrospective study conducted at a tertiary care Centre between January 2013 to January 2015. We did the study on a case series of 366 patients treated with trabeculectomy. All the patients and their bystanders were explained regarding the benefits and risks of the procedure, before obtaining the informed consent. The study subjects age varied from 4years to 87 years of age, with all entities of medically uncontrolled glaucoma. The patients were worked up in the clinic, the IOP, measured with Goldmann applanation tonometer and gonioscopy performed under appropriate testing conditions. Optic disc changes were noted, with focal or diffuse neuroretinal rim thinning or notching. Patients with uncontrolled IOP's with glaucomatous optic damage who underwent trabeculectomy, were enrolled into the study. The aim of our study was to assess the incidence of early post-operative complications in patients who underwent trabeculectomy. We also compared the complications in trabeculectomy with MMC cases and without MMC cases.

The procedure was the same for both the groups, The MMC Group had (0.04%) soaked sponges placed sub-conjunctival over a wide area for 2-3 minutes, later the sponges were removed, and the area was copiously irrigated with 20 cc of ringer lactate. Postoperatively, all patients were treated with topical antibiotic- steroid eye drops in tapering doses over 6 weeks, and cyclopentolate 1% eye drops 2 times-a-day for 2 to 3 weeks.

Post-operative visits were scheduled at day 1, day 7, 1 month, and 3 months. At each visit, BCVA, IOP, complications (including need for antiglaucoma medications) were recorded. IOP was measured and was defined as successful surgery if it was >6mmhg and <21mmhg. Complication was defined as IOP>22mm hg which required ocular massage or anti glaucoma medications, hypotony maculopathy, bleb leak or needing any additional procedure like bleb needling, 5 FU injections, PC rent on table, re-trabeculectomy to control the IOP, loss of light perception.

RESULTS: We enrolled 366 cases who underwent trabeculectomy in our study. Out of these cases 63 cases had complications. We also compared the rate of complications in cases, augmented with MMC and without MMC. MMC augmented trabeculectomy was done in 74 cases as compared to 292 cases without MMC. Table-1 shows the rate of complications in percentage in the Trabeculectomy patients.

Among the enrolled trabeculectomy cases of 366, about 63 patients had complications, which forms about 17.2% of the total cases. There were 3 cases with Posterior capsular rents (4.8%) reported during cataract surgery with trabeculectomy. All the cases were managed well,

except for one, which was left aphakic. Table -2 shows rate of shallow AC in the Early Post-Operative period.

Shallow AC was reported in 18 cases, were siedel's was positive in 12 cases (19.0%). Among the 12 cases, 9 cases were resutured and in 3 cases scleral patch grafting was done. Siedel's negative was seen in 6 cases (9.52%). AC reformed, back to normal in 2 cases, by itself and in another 2 cases pad and bandage was required for 2 days. In 1 case choroidal detachment was noticed, which was medically managed with steroids. AC reformation was done for 1 case with a high IOP, which reverted back to normal, after the intervention.

Severe uveitis, following trabeculectomy was seen in 9 cases (14.28%), which were medically managed, and among which 2 required membranectomy. Table-3 shows cases with High IOP. As tabulated in table -3, about 29 cases were shown to have high IOP, which was later managed in various ways. 10 cases (34.5%) responded well to ocular massage and the IOP was maintained at a low level. 37% (11 cases) required medical management with anti-glaucoma medications. Bleb needling was done for a case (3.4%) with uncontrolled high IOP. 4 cases (13.7%) responded well to 5 FU injections in controlling IOP. In a case with high IOP with decentered IOL, the IOP got back to normal after explanting the IOL out. Retrabeculectomy was done in 2 cases, in which one had a blocked osteum.3 cases had encapsulated bleb. We also noticed a case where, the vitreous haemorrhage was aggravated following trabeculectomy and required vitrectomy to improve the vision. We also compared the cases with complications with and without MMC.

Table-4 shows the number of cases with and without MMC in the study group. Table -5 compares the rate of complications developed in cases with MMC and without MMC.

Out of the 63 cases with complications, 17 cases (26.98%) were with MMC and 46(73.01%) were without MMC. Table 6 shows complications in patients in whom MMC was used per-operatively. Table 7 shows complications in the patients who did not receive MMC.

DISCUSSION: Our study shows various complications, encountered in the early post-operative period in trabeculectomy patients. In a national survey of glaucoma surgery complications among 1240 cases, performed in United Kingdom, early complications included hypotony (24%),wound leak (18%), and choroidal detachment (14%).[14]

The higher success rate of trabeculectomy with MMC as compared to simple trabeculectomy has made this procedure a preferred surgical choice for glaucoma.[15,16,17,18] However, MMC application is associated with higher long-term bleb-related complications.[19,20,21]

Yalvac et al, reported shallow anterior chamber, choroidal detachment, and encapsulated bleb were seen in 4.2%, in his study.[22] Similarly, Tsai et al, had one case (3%) each of conjunctival dehiscence and cataract and two cases of encapsulated bleb (7%) in their study.[23]

The TVT study and collaborative initial glaucoma treatment study, showed an incidence of 37% and 50%, early postoperative complications, within the first one month, respectively.[24] The surgical complications seen in each of the clinical trials were transient and self-limited, such as shallow anterior chamber and choroidal effusions. It is not unexpected that prospective studies generally report higher complication rates than retrospective case series.

The highest number of complication reported in our study was High IOP (46%) followed by shallow Anterior chamber (28.57%), severe reaction (14.28%) and encapsulate bleb (4.8%).

High IOP were recorded in 29 cases, which stood as a major complication in our study. 37% was medically managed, 34.5% responded well to ocular massage. 13.7% required 5FU injection and 3.4% required bleb needling. 5 FU injections were mainly given to young patients who had raised uncontrolled IOP post trabeculectomy. Gressel et al[25] reported that the success of trabeculectomy was only 44% in patients, less than 30 years of age as compared to 83% in the older age group. The authors have suggested the use of antimetabolites in younger patients for better success.

Trabeculectomy, results in an immediate filtration of aqueous humour near the conjunctival incision with a greater tendency toward postoperative wound leaks. The rate of would leak after trabeculectomy was slightly higher in the TVT Study (11%) than in the Advanced Glaucoma Intervention Study (AGIS) (6.5%)[26] or CIGTS (6%).[25]

Careful closure of scleral flap to reduce post-operative overfiltration and meticulous conjunctival closure can be done to avoid a shallow anterior chamber. In case of shallow anterior chamber, we checked the seidel's test Seidel's was positive in 12 cases (19%), which required resuturing and scleral patch grafting. Seidel's negative was there in 6 cases (9.52%).One case had choroidal detachment which responded well to oral steroids.

Encapsulated blebs are common, occuring in 3.6% to 28% of eyes.[27,28] Higher frequencies of encapsulated bleb have been reported in males and in patients undergoing trabeculectomy alone versus trabeculectomy combined with cataract surgery.[29,30] Use of MMC, was suggested to increase it, on the basis of 29% incidence in one series[31] although other studies haven't confirmed it.[32] In our study, the 3 cases of encapsulated bleb, 2 were in the MMC group. But the number is too less to be statistically significant.

Tsai et al[33] have shown better IOP control with MMC use, but with increased sight threatening complications, ultimately decreased the outcome of success at 3 year follow-up. Tsai et al[33] reported a 20% incidence of hypotonic maculopathy in the MMC group and none in the trabeculectomy group. However our study did not report any sight threatening complications.

Out of our 63 cases with complications, 17 cases (26.98%) were with MMC, and 46 cases (73.01%) were without MMC. We found that the complications were less in cases with MMC. However, shallow anterior chamber which required resuturing, were equal in both groups with 6 cases in each side. High IOP, which required intervention both medically and surgically, were more in the cases without MMC, suggesting good post-operative IOP control with MMC. Adelman et al.[34] have shown the rate of cataract extraction to be 24%, following trabeculectomy in glaucoma patients. This was a significant complication, which was noted during the follow-up over 11–90 months. In our study, the cataracts were not noted in, probably because of a lesser follow up period.

CONCLUSION: The complications in our study were more due to inadequate IOP control, but none had any sight threatening complication. All the eyes with IOP >21 mmHg, that did not qualify for the complete success in our study were, controlled medically with one or two medications and surgically intervened with bleb needling and 5 FU injections. We also found that ocular massage can play a major role in controlling the raised IOP in the post-operative period.

The limitations of our study, are its retrospective design. Multiple surgeons were involved, with all surgeries having a fornix base approach. However, this is unlikely to have influenced the results as studies comparing success rates of fornix- and limbal-based conjunctival approaches have shown similar results.[35] Also in our study, more than half the patients, were lost to follow-up by the end of 1 month, due to poor socio-economic scenario. We evaluated our results considering the worst-case scenario in the eyes that were lost to follow-up. Even after considering all eyes, lost to follow-up within 1 month after surgery, to document complications, the rate of complications probability remained less. We also found that Augmented Trabeculectomy with MMC showed a less percentage of complications, suggesting that, the major complication in post trabeculectomy can be raised IOP leading to a failed surgery.

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Total No. of cases	**No. of cases with complications**	**% of complications**
366	63	17.2%

Table 1: Rate of complications in percentage in the trabeculectomy patients

Shallow AC	**Siedel's +ve**		**Siedel's –ve**	
	12	19.04%	6	9.52%

Table 2: Rate of shallow ac in the early post-operative period

Complication	**No. of cases**	**Rate in %**
High IOP	**29**	**46%**
1. Ocular massage	10	34.5%
2. Medically managed	11	37%
3. Bleb needling	1	3.4%
4. 5 FU injection	4	13.7%
5. Retrabeculectomy	2	6.9%
6. Decentered IOL	1	3.4%

Table 3: Cases With High IOP

Cases with MMC	74	20.2%
Cases without MMC	292	79.8%
Total Cases	**366**	**100%**

Table 4: Number of cases with and without mmc in the study group

Complication	No. of cases	Rate in %
With MMC	17	26.98%
Without MMC	46	73.01%
Total Cases	**63**	**100%**

Table 5: The rate of complications in cases with and without MMC

MMC	COMPLICATION	Total Cases
YES	ENCAPSULATED BLEB	2
	HIGH IOP-5 FU INJ	2
	HIGH IOP-MEDICAL MANAGEMENT	1
	HIGH IOP-RETRAB	1
	SEVERE REACTION	4
	SHALLOW AC -SIEDELS -VE	1
	SHALLOW AC,SIEDELS'S +,SCLERAL PATCH GRAFT	1
	SHALLOW AC-SIEDEL'S +,RESUTURING	5
Total		**17**

Table 6: Complications in patients with MMC

MMC	COMPLICATION	Total Cases
NO	ENCAPSULATED BLEB	1
	HIGH IOP-BLEB NEEDLING DONE	1
	HIGH IOP-5 FU INJ GIVEN	2
	HIGH IOP-DECENTERED IOL-IOL REMOVED	1
	HIGH IOP-MEDICALY MANAGED	10
	HIGH IOP-OCCULAR MASSAGE	10
	HIGH IOP-RETRABECULECTOMY	1
	PC RENT	3
	SEVERE REACTION	5
	SHALLOW AC -SIEDELS -VE,NO CD,MEDICALLY MANAGED	2
	SHALLOW AC,SIEDEL'S - VE,CD PRESENT,MEDICALLY MANAGED	1
	SHALLOW AC,SIEDEL'S -VE	1
	SHALLOW AC,SIEDELS'S +,SCLERAL PATCH GRAFT	2
	SHALLOW AC-HIGH IOP-AC REFORMATION	1
	SHALLOW AC-SIEDEL'S +,RESUTURING	4
	VH AGGRAVATED, ADV VITRECTOMY	1
Total		**46**

Table 7: Complications in The Patients Without MMC

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