

## A STUDY OF OUTCOME OF INTRA-OPERATIVE TOPICAL APPLICATION OF 5- FLUOROURACIL (5-FU) IN TRABECULECTOMY

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### **Abstract**

#### **Keywords:**

Intra-operative 5 FU,  
Trabeculectomy, corneal  
complications, bleb related  
endophthalmitis.

**Aim:** A study of long term efficacy and ocular toxicity of intra-operative topical application of 5-FU in trabeculectomy.

**Material & Methods:** The study includes retrospective analysis of 43 eyes of 22 patients who underwent trabeculectomy with intra-operative application of 5- FU.

**Results:** With minimum 6 months follow up 34 eyes (79 %) got good IOP control without medication. 7 eyes (16.30 %) got good IOP control with 1 topical drug. 1 eye (2.33 %) got intractable neo vascular glaucoma and 1 eye (2.33 %) got malignant glaucoma. There were no corneal complications seen. Only 3 eyes (6.97 %) got persistent hypotony in 6 months follow up and 1 eye (2.33 %) got bleb related endophthalmitis after 2 years following trauma.

**Conclusion:** Our study shows that intra-operative use of 5-FU is safe and effective alternative to mitomycin c.

### **Introduction**

Success of trabeculectomy depends upon bleb formed in it i.e., subconjunctival accumulation of aqueous. In uncomplicated cases, success of trabeculectomy is 80-90% <sup>(1)</sup>. Factors associated with increased bleb failure are youth, aphakia, anterior segment neovascularisation, trauma, previous failed glaucoma surgery. Most common cause of bleb failure is extra ocular scarring at the episcleral-conjunctival interface secondary to fibroblast proliferation, synthesis of extracellular matrix and subsequent fibrosis <sup>(2 3)</sup>. 5-Fluorouracil, a halogenated pyrimidine inhibits dTMP synthesis and is more lethal to rapidly multiplying cells than stationary cells. The use of postoperative subconjunctival 5-fluorouracil (5-FU) has considerably improved the success rate of glaucoma filtering surgery. The use of intraoperative sponge 5-FU has been proposed as this antimetabolite may cause corneal epithelial defects in the early postoperative period and repeated subconjunctival injections is inconvenient for patients. <sup>(4-8)</sup>

### **Material and methods**

This study was initiated after approval of institutional ethics committee at a tertiary care hospital. Trabeculectomy was performed with intra operative use of 5 FU in 43 eyes of 23 cases (21 bilateral and 1 unilateral) from 2003 to 2011. Patients with age less than 40 and pseudo-exfoliation syndrome were included in study. Patients with initial low intra-ocular pressure (IOP) and compromised cornea were excluded. Informed consent was obtained from each patient. Routine pre-operative investigations were done in all the patients prior to trabeculectomy. Preoperative evaluation with thorough anterior and posterior segment examination was performed. Local anaesthesia was achieved with peribulbar block. After taking superior rectus suture upper nasal quadrant was selected for fornix based conjunctival flap. Paracentesis was done after achieving haemostasis. Then half thickness 4x 5 mm sized outer scleral flaps was dissected. A cellulose sponge soaked with 50 mg/ml 5- FU was placed under the scleral and conjunctival flap for 5 minutes following which the area was copiously irrigated with 40 ml ringer lactate solution. Then an inner block of trabecular tissue of size 2x3mm was excised. After doing peripheral iridectomy the scleral flap was reapposed with 4 interrupted 10-0 nylon sutures. The conjunctival flap was sutured with 10-0 nylon sutures. Oral antibiotics and NSAID were prescribed for 5 days postoperatively. Topical antibiotic-steroid eye drops were given for 6 weeks in tapering doses. Cycloplegics were added topically for 2 weeks anti glaucoma medications were

added as needed. Visual acuity, IOP, bleb characteristics, and the occurrence of anterior and posterior segment complications were monitored at intervals 1 week, 1 month, 3 months, and at 6 months. Results were calculated using percentages of surgical success, qualified success and surgical failure. Surgical success was defined in the study as IOP <22 mmHg without use of adjunctive anti glaucoma medications. Qualified success was defined as IOP <22 mm Hg with use of adjunctive anti glaucoma medications. Surgical failure was defined as IOP ≥22 mmHg with use of anti-glaucoma medications.

## Results

Out of 43 eyes, 34 eyes achieved good IOP control without medication. 7 eyes achieved good IOP control with one topical drug. 1 eye was diagnosed intractable malignant glaucoma. 1 eye developed Central Retinal vein Occlusion and neovascular glaucoma 5 months after surgery. 1 eye developed bleb related Endophthalmitis 2 years after surgery following blunt trauma. 3 eyes were detected with persistent post-operative hypotony and required additional flap sutures. So the surgical success rate was 79.06%. Qualified success was 16.27% and surgical failure was 4.65%. So total success rate of use of 5FU in trabeculectomy was 95%. Post-operative mean IOP at 6 weeks was 16.93± 2.24 mm of Hg.

## Discussion

Studies of initial trabeculectomy alone for the uncomplicated glaucoma have demonstrated a gradual decline in success rates over time. With subconjunctival injection of 5 FU, encouraging results have been obtained in Indian eyes in moderate to high risk cases. Apart from high complication rates, sub conjunctival injections of 5 FU are uncomfortable for the patient and inconvenient to the physician. Searching for alternative route of 5 FU delivery to reduce the dose, Deitze et al. used single intra operative application of 5 FU, 50 mg/ ml for 5 minutes under scleral flap and reported 85% success at 3 months with no complications<sup>4</sup>. Sub sequent experimental and clinical studies show comparable results. Khaw et al<sup>13</sup> have demonstrated a reversible delay in fibroblast growth by 1 week on a 5 minutes intra operative exposure 5 FU. In present study including surgical and qualified success total success rate was 95% and there were no corneal complications. 1 case of bleb related endophthalmitis was after 2 years following blunt trauma and 1 case of malignant glaucoma. Good success rates and relatively fewer complications compared to mitomycin C and post operative 5 FU regimen encourage the routine use of intra operative 5 FU in high risk cases.

## Conclusion

Intraoperative use of 5FU is safe and effective alternative to mitomycin c.

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