



TRABECULECTOMY: PUNCH VS BLOCK EXCISION - A PROSPECTIVE COMPARATIVE STUDY

Ophthalmology

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ABSTRACT

AIM: To assess the effectiveness of punch vs block excision in trabeculectomy for adult glaucoma with specific focus on IOP control and complications

MATERIALS AND METHODS: 60 eyes of 60 glaucoma patients of age group 40-60 yrs included, randomly divided into 2 groups. Group 1 (n =30) underwent trabeculectomy with Kelly Descemet membrane punch as against Group 2 (n=30) block excision, patients were followed for a period of 1 year

RESULTS: Success rate after 12 months of follow up were comparable in both groups, 76.6 % (23) in punch group and 80% (24) in block excision group having P = 0.44 Overall success rate was 78.3% (47) Mean IOP drop was more in Group 2 P = 0.47. More post-operative complications in Group 1.

CONCLUSION: The Block excision group had less post-op complication and better control of IOP as compared to punch trabeculectomy.

KEYWORDS

trabeculectomy, Kelly Descemet membrane punch, block excision

INTRODUCTION:

Ever since the first glaucoma surgery in 1856, the goal has been to decrease intraocular pressure (IOP), the only modifiable risk and prognostic factor for glaucoma.¹ Maintaining IOP below the Target reduces field loss and improves optic nerve circulation.^{2,3,4,5} Trabeculectomy, introduced by Cairns⁶ and modified by Watson⁷ has become the favoured procedure for the surgical management of various types of glaucoma.

Trabeculectomy has gained worldwide acceptance as perhaps the safest and most effective drainage operation for glaucoma. While the pressure reducing effect is comparable to that of other drainage procedures, it has been shown to have a lower risk of delayed reformation of the anterior chamber, cataract, and ruptured or infected drainage bleb.⁸ Successful trabeculectomy involves reduction of IOP and avoidance or management of complications. Success of trabeculectomy often depends on appropriate and timely postoperative intervention to influence the functioning of the filter. Complete healing of the epithelial and conjunctival wound with incomplete healing of the scleral wound is the goal of this procedure⁹

Trabeculectomy, involves the creation of a partial-thickness scleral flap over a sclerostomy into the anterior chamber.¹ sclerostomy is commonly performed with the use of a punch or a block excision with a fine blade.^{9,10}

Punch trabeculectomy is a rapid and effective method of controlling IOP. The complication rate is moderate and mainly transient.¹¹

With this background the study was done with the aim to assess effectiveness of punch vs block excision in trabeculectomy for adult glaucoma with specific focus on IOP control and complications.

METHODOLOGY:

A total of 60 eyes of 60 patients who attended VSSIMSAR, BURLA OPHTHALMOLOGY OPD with h/o glaucoma were included in the study and enquired for date of birth, gender, type of glaucoma, Duration of the disease, preoperative medication and its duration. Out of 60 cases, group 1 included 30 patients who underwent trabeculectomy with Kelly's punch and group 2 included rest of the 30 cases who underwent block excision.

INCLUSION CRITERIA:

1. Not responding adequately to medical therapy and/or laser
2. Visual field loss despite adequate IOP reduction with medication and/or laser
3. Noncompliance to medical regimen

EXCLUSION CRITERIA:

1. Blind eye
2. Rubeosis iridis
3. Unreliable applanation recording
4. Active anterior uveitis
5. Conjunctival injury or thin sclera
6. Previous filtering surgery
7. Age <40 yrs, >60yrs
8. Aphakia/ pseudophakia
9. Systemic contraindications

PRE-OP INVESTIGATIONS:

1. IOP (APPLANATION)
2. FUNDOSCOPY
3. GONIOSCOPY
4. AUTOMATED PERIMETRY

Preoperative IOP was expressed as the value measured by applanation tonometry at the visit immediately prior to trabeculectomy.

TARGET IOP CALCULATION¹²:

AAO STAGING	CRITERIA
MILD	OPTIC DISC CUPPING BUT NO VISUAL FIELD LOSS
MODERATE	GLAUCOMATOUS NEUROPATHY WITH VISUAL FIELD LOSS NOT WITHIN 5° OF FIXATION
SEVERE	VISUAL FIELD LOSS IN BOTH HEMISPHERES OR WITHIN 5° OF FIXATION

Target IOP for each group are, 18, 15, 12 mm of hg, respectively for mild, moderate, severe Glaucoma, according to AAO criteria.

SURGICAL TECHNIQUE:⁹

All the patients underwent the surgical procedure under local anaesthesia. Peribulbar block was given. A superior rectus bridle suture was given for good exposure of superior sulcus and limbus. A fornix-based conjunctival flap is used. 3- to 4-mm triangular Scleral flap was incised. Paracentesis performed. The sclerostomy was created with the use of a punch or a block was cut with the use of a fine blade as per the groups assigned. An iridectomy is performed to reduce the risk of iris occluding the sclerostomy. Closure of scleral flap, conjunctiva is done after Flow adjustment with 10-0 ethilon.

Postoperatively, topical atropine t.i.d., antibiotics q.i.d., were given for up to 7 days. Steroids were tapered.

Patients were followed up on Day 1, 7, 90, 180, 360

Any ocular adverse effect which required surgical or medical intervention for management apart from regular postoperative regimen was considered as complication of the surgery

The surgical outcome was compared on following parameters:

1. IOP
2. Post-op complications

Complications within 3 months of follow up were counted as early and beyond 3 months were late.

Complete success was defined as the patient attaining and maintaining target IOP without bleb failure. Failure was defined as need for more than 2 medicines postoperatively for IOP control.

RESULTS & DISCUSSION:

In our study, total 33 females and 27 males had undergone trabeculectomy, out of which 17 females (51.5%) and 13 males (48.1%) underwent trabeculectomy with punch and 16 females (48.5%) and 14 males (51.9%) underwent trabeculectomy with block excision.

All the patients were in the age group of 40 to 60 years, with mean age of 49.63 years in the punch group versus 50.2 years in block excision.

Mean pre-operative IOP was comparable in both the groups, being 30.53 ± 3.41 mm of hg (range 26-37 mm of hg) and 30.63 ± 3.00 mm of hg (range 25-36 mm of hg) in respective groups.

IOP (in mm of hg) was measured on each follow up and mean was calculated as per table 1

TABLE 1: IOP IN FOLLOW UP PERIOD

GROUPS	I	II	SIGNIFICANCE
DAY 1	21.4 ± 2.8	21 ± 3.1	0.603
DAY 7	19.8 ± 3.1	19.5 ± 3.6	0.702
DAY 90	19.5 ± 3.6	18.5 ± 3.7	0.276
DAY 180	19.07 ± 3.7	17.93 ± 3.8	0.241

The mean IOP drop was calculated in both the groups. (Table 2)

TABLE 2: MEAN IOP DROP

GROUPS	PREOP	1 YEAR	MEAN IOP DROP
I	30.53 ± 3.41	19.03 ± 4.247	11.5
II	30.63 ± 3.00	17.7 ± 3.78	12.93
SIGNIFICANCE		0.227	0.471

The mean IOP after 1 year of trabeculectomy was more in Group II being 12.93 as compared to Group I being 11.5 mm of hg.

We encountered following early post-op complications (hyphema, shallow/flat ac, bleb leak, hypotony and late complications (Malignant glaucoma cataract, persistent uveitis, post op scarring).

TABLE 3: POST-OP COMPLICATIONS

POST OPERATIVE COMPLICATIONS	GROUP I (EARLY)	GROUP I (LATE)	GROUP II (EARLY)	GROUP II (LATE)	TOTAL
HYPHEMA	5 (16.7%)	1 (3.3%)	3 (10%)	1 (3.3%)	10 (16.7%)
SHALLOW / FLAT AC	4 (13.3%)	1 (3.3%)	2 (6.6%)	1 (3.3%)	8 (13.2%)
BLEB LEAK	4 (13.3%)	2 (6.6%)	2 (6.6%)	1 (3.3%)	9 (15%)
HYPOTONY	2 (6.6%)	2 (6.6%)	2 (6.6%)	1 (3.3%)	7 (11.6%)
MALIGNANT GLAUCOMA	0	1 (3.3%)	0	1 (3.3%)	2 (3.3%)
POST OP SCARRING	2 (6.6%)	4 (13.3%)	1 (3.3%)	1 (3.3%)	9 (15%)
CATARACT	1 (3.3%)	4 (13.3%)	0	4 (13.3%)	9 (15%)
PERSISTENT UVEITIS	2 (6.6%)	1 (3.3%)	1 (3.3%)	2 (6.6%)	6 (10.0%)

Complications were more in punch group, as shown in Table 3.

Hyphaema was the most frequent complication being reported in 10 cases (16.7%), which is less than Edmunds' study- 24.6%, comparable to Ridgway 15.9%.^{14,15}

The incidence of shallow or flat anterior chamber was 13.2% in this study, which is comparable to 13.1% Mills' study, less as compared to Mc Phersons' 16.1%, Edmunds' 24.1%.^{14,15}

Bleb leak occurred more frequently than in other trabeculectomy outcome studies. Although bleb leak is not consistently reported in the literature, where it is mentioned the rate varies from nil to 20.4%. In this study bleb leak was 15%, which is comparable to Edmunds' 17.6%.^{14,15}

Hypotony was 11.6%, the considerable variance in the reported rates of hypotony is paralleled by its variety of definitions in the literature. Seah, found an incidence of 70% (hypotony defined as an IOP of < 6 mmHg at any point following trabeculectomy).⁹ Edmunds' has a 24.3%. Our study had very less hypotony as compared.^{14,15}

Malignant glaucoma is more common after trabeculectomy for angle-closure glaucoma than open angle glaucoma. In our study we found 2 cases, having late presentation. It was more than 0.2% Edmunds' 0.7% Mills'.^{14,15}

Cataract development defined by patients who had lost more than one line of best corrected Snellen acuity by 1 year after trabeculectomy, was 15% in our study. It was comparable to 15.2% Mills' 18.8% Edmunds'.^{14,15}

Table 4 shows the success of both groups. Significance = 0.44

TABLE 4: SUCCESS RATES OF TRABECULECTOMY

	GROUP 1	GROUP 2	TOTAL
NO. OF PATIENTS	30	30	60
NO. OF FAILURES	7	6	13
% OF FAILURE	23.3	20	21.7
% OF SUCCESS	76.7	80	78.3

Overall success rate of trabeculectomy in this study was 78.3%. Success was more in block excision group as compared to punch. Which is comparable to D'Ermo et al¹⁶ 76% & Mutsh¹⁷ & lower than Jacob et al¹⁸ 82.35%.

CONCLUSION:

Though long-term results are still under evaluation, satisfactory IOP control was noted by us after both the techniques, with favourable outcome towards block excision as compared to punch. The small sample size and the limited follow-up makes it difficult to draw a strong conclusion pertaining to long term outcomes and complication rate. This study however serves to lay the foundation for further detailed comparison of both techniques. A long-term study in a larger population will be required to confirm the outcomes of this study. Though the overall success rates were similar, the preference & suitability of the surgeon should be considered while operating.

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