INTRODUCTION

Total hyphaema means blood in the anterior chamber totally filling it. Hypertensive traumatic total hyphaema means a hyphaema with raised intraocular pressure (IOP) above 21 mm of Hg caused by blunt trauma.

Traumatic hyphaema usually occurs in young man. Incidence varies from 17-20/million population. Most of the low-grade hyphaemas are managed medically by pressure lowering agents and steroids but total hyphaema with increased intraocular pressure requires urgent intervention. Corneal blood staining and optic nerve damage are the most dreaded complications encountered when secondary bleeding occurs in these cases. Various methods are used for the surgical management of hyphaema including anterior chamber wash out; irrigation with fibrinolytics; manual expression; phacoemulsification and aspiration; evacuation by vitrectomy instrument; iridectomy alone; and trabeculectomy. If proper intervention is not undertaken at an appropriate time, patients may go blind in majority of cases. There is no universal agreement on the method of intervention in hypertensive total hyphaema. Trabeculectomy with iridectomy described by Weiss, Parrish and Anderson in 1983 found to be a good approach in these cases.

The objective of this study was to assess the visual outcome and complication rates of trabeculectomy in patients with traumatic hypertensive hyphaema resistant to the medical treatment.

METHODOLOGY

This study was conducted at the Department of Ophthalmology, Dow University of Health Sciences, Karachi, from June 2004 to May 2008. Non probability deliberate purposive method of sampling was used for patient selection. We included patients of all ages with corneal blood staining having total hyphaema with an intraocular pressure of 50 mmHg or more for five days or hyphaema that was initially total and did not resolve below 50% in 6 days with intraocular pressures of 25 mmHg or more or hyphaema that remained unresolved for 9 days. Patients without visual potential, rubeosis

ABSTRACT

Objective: To assess the visual outcome and complications after trabeculectomy in patients of hypertensive traumatic total hyphaema.

Study Design: Case series.

Place and Duration of Study: Department of Ophthalmology, Dow University of Health Sciences, Karachi, from June 2004 to May 2008.

Methodology: Patients with total hyphaema admitted in eye ward were included. Socio-demographic data was recorded. Complete ophthalmic examination and B-scan ultrasonography were undertaken. Trabeculectomy was performed. Visual outcome, intraocular pressure reduction and complications were recorded. Descriptive statistics were calculated.

Results: Twenty two patients underwent trabeculectomy with mean age was 23.18 ±12.67 years. Male to female ratio was 3.26:1. Toy gun pellet injury was present in 6 (27.3%) cases. The average intraocular pressure before surgery was 40.86 mm of Hg. All the patients had a visual acuity of light perception with an accurate projection. Evidence of corneal blood staining was observed in 16 (72.7%) patients. Mean intraocular pressure at last follow-up was 15.1 ± 2.11 mm of Hg with a minimum of 12 mm and maximum of 20 mm of Hg in 19 (86.3%) patients (complete success). Three patients were on additional anti-glaucoma medications. Filtering bleb was functional in only 4 (18.2%) patients. Visual acuity was 6/18 or better in 18 (81.8%) patients at last follow-up.

Conclusion: Trabeculectomy was a satisfactory procedure for traumatic hyphaema for restoring good vision, if undertaken earlier. This procedure is not associated with significant complications and is very useful in reducing raised intraocular pressure.

Role of trabeculectomy in the management of hypertensive traumatic total hyphaema

Patients were admitted in eye ward and complete socio-demographic data was recorded on a prescribed performa. All the patients underwent complete ophthalmic examination including Snellen’s visual acuity, intraocular pressure by applanation tonometer, pupillary reaction and evidence of corneal blood staining before they underwent surgical intervention. All the patients underwent B-scan ultrasonography to exclude any posterior segment pathology.

A fornix-based conjunctival flap was raised followed by tenectomy. A rectangular limbal based superficial sclera flap incision (5 x 4 mm) was dissected until the surgical limbus was seen. The trabeculectomy was then completed with a rectangular deep corneo-scleral block excision (3 x 2 mm). A peripheral iridectomy was performed. Closing the superficial scleral flap with 10/0 nylon suture. The conjunctiva was also sutured with 8/0 vicryl silk. Subconjunctival gentamycin (20 mg) and dexamethasone 4 mg were injected into the inferior fornix.

The outcome of trabeculectomy was correlated with documented biomicroscopic appearance of the filtering bleb, visual acuity and IOP levels. The outcome of the surgery was classified as complete success (post-operative IOP at one year was 20 mmHg or less without anti-glaucoma medication), qualified success (post-operative IOP was 20 mm Hg or less with additional anti-glaucoma medication) and failure (postoperative IOP was greater than 20 mm Hg in spite of maximum anti-glaucoma medication).

Data was entered and analysed on SPSS version 15 for windows. Frequency distribution tables were used to present the data. Mean and standard deviation were used for continuous variables. Categorical variables were presented as proportions and percentages.

RESULTS

Twenty two patients underwent trabeculectomy. Mean age was 23.18 ± 12.67 years with a minimum of 6 years and a maximum of 53 years. Nineteen (86.4%) patients were 40 years of age or below (Table I). Gender distribution was 16 (72.73%) males and 6 (27.27%) females. Male to female ratio was 3.26:1. Majority of patients experienced blunt ocular trauma resulting from toy gun pellet in 6 (27.3%) cases. Other causes included stone thrown by another child in 4 (18.2%), motor vehicle accidents in 3 (13.6%) cases, tennis ball, fist, stick and cricket ball hit in 2 (9.1%) cases each, and boot kick in 1 (4.5%) case. Average intraocular pressure before surgery was 40.86 ± 6.82 mm of Hg with a minimum of 32 and maximum of 62 mm of Hg. All the patients had a visual acuity of light perception with an accurate projection. Evidence of corneal blood staining was observed in 16 (72.7%) patients, while 6 (27.3%) patients had unresolving hyphaema. Mean follow-up period was 29.36 ± 4.13 weeks with a minimum of 24 weeks and a maximum of 38 weeks. The mean time interval between ocular trauma and surgical intervention was 12.09 days ranging from 5 to 23 days. This long interval was due to late referral to a tertiary care centre and observation of the patients before the indication of surgical interventions. Mean intraocular pressure during first week after surgery was 17.55 ± 7.86 mm of Hg being 21 mm of Hg or below in 18 (81.8%) patients. Three patients required additional anti-glaucoma medications while one patient underwent further surgical intervention. Mean intraocular pressure at last follow-up was 15.1 ± 2.11 mm of Hg with a minimum of 12 mmHg and maximum of 20 mm of Hg in 19 (86.3%) patients (complete success). Three patients were on additional anti-glaucoma medications for a normal intraocular pressure (qualifies success). Filtering bleb was functional in only 4 (18.2%) patients at last follow-up, while it was flat in 18 (81.8%) patients. Visual acuity at last follow up was 6/18 or better in 18 (81.8%) as shown in Table II. Three patients (13.6%) had visual acuity of 6/60 or less at last follow-up. Those patients with a visual acuity of less than 6/60 had various causes. Severe corneal staining in 2 cases and one case showed optic discs cupping. Patient with optic disc cupping also had relative afferent pupillary defect. Residual corneal blood staining was evident in 16 (72.7%) cases and varying degree of optic nerve damage in 9 (40.9%) cases at last follow-up.

DISCUSSION

Ocular trauma is a major cause of morbidity in developed and developing countries.12,13 Hyphaema resulting from blunt ocular trauma is usually managed conservatively. These patients are observed to minimize anticipated complication if intraocular pressure could not be controlled despite maximum effort. An intraocular pressure of 35 mm of mercury can cause irreversible optic nerve damage if sustained for five days and an
intraocular pressure of 50 mm of Hg can do the same in 3 days. More urgent intervention for pressure reduction is needed in cases of sickle cell trait. Corneal blood staining is another cause of morbidity in cases of total hypertensive hyphaema, if intraocular pressure is not brought under control within confined time duration. Although cases have been reported in which corneal blood staining occurs at a low intraocular pressure, surgery in these patients is indicated if the IOP rises. The time for surgical intervention varies but all agreed that earlier the intervention better the visual outcome. Optic nerve damage occurred in half of the patients whose surgery was performed 8 or more days after the hyphaema occurred, but was absent in those undergoing earlier surgery, therefore, Weiss, Parrish and Anderson advised surgery on the same day. Read and Goldberg found that the incidence of corneal blood staining rises if the IOP is greater than 25 mm of Hg for 6 days. Surgical intervention is required when evidence of microscopic corneal blood staining is present on slit lamp examination. Corneal blood stain remains for years and is not amenable to any medical treatment. In addition, staining causes amblyopia in young children. In this series, the mean time interval between occurrence of hyphaema and surgical intervention was 12.09 days, which was probably a cause of higher frequency of corneal blood staining and optic nerve damage.

For the management of total hypertensive hyphaema some authors prefer simple anterior chamber wash out. This method is insufficient for complete evacuation of clot because with time clot gets organized, while small clots are evacuated, the bulk remains in the anterior chamber, exciting inflammatory reaction, releasing blood cells and ghost cells. All these factors cause an elevation of intraocular pressure. Manual expression causes a complete evacuation of clot and assessment of the anterior chamber becomes possible due to clearing of the media.

Trabeculectomy for total hypertensive hyphaema was first reported by Weiss, Parrish and Anderson in 1983 in a series of 21 patients. Their result showed that 43% developed corneal staining; optic nerve damage occurred in 50% of the patients whose surgery was performed 8 or more days after the hyphaema occurred and no surgical complications occurred. They suggested that earlier surgery might reduce the incidence of optic nerve damage and corneal staining. In this series of 22 patients residual corneal blood staining was evident in 16 (72.7%) patients and optic nerve damage of varying degree in 9 (40.9%) cases at last follow-up. High frequency of these complications might be due to late surgical intervention. In this series, the mean time interval between occurrence of hyphaema and surgical intervention was 12.09 days. In another series of 11 consecutive cases of total hypertensive traumatic hyphaema, Graul et al. performed trabeculectomy, peripheral iridectomy and anterior chamber wash out. In their series, mean pre-operative intraocular pressure was 48 mmHg, which was lowered to 21 mmHg or less after surgery and remained below that level upto the most recent follow-up which ranged from 8 to 97 months. Eight (72.7%) patients had visual acuity of 20/60 (6/18) or better at last follow-up. Corneal blood staining occurred in 8 (72.7%) patients. The time interval between occurrence of hyphaema and surgical intervention in their series was less than 15 days. Results with respect of corneal blood staining and control of intraocular pressure were matching but visual outcome in the present study was not good. Visual acuity of 6/18 or better was found in only 11 (50%) cases. This poor visual outcome might be due to late surgical intervention leading to corneal staining and optic nerve damage.

In this study, males outnumbered the females by a ratio of 3.26:1. In a study conducted by Khan et al. in NWFP, male to female ratio was 8:1. In another study by Kearns, male to female ratio was found to be 5.4:1. This male preponderance was due to the fact that males were involved in most of the outdoor activities. In this study, most of the patients were 40 years of age or below. This finding indicates higher prevalence of ocular trauma in young people as found by many observers.

**CONCLUSION**

Trabeculectomy is a satisfactory procedure for traumatic hypertensive hyphaema, if undertaken earlier. Trabeculectomy creates a new opening for aqueous outflow, iridectomy relieves the pupillary block and removal of blood clot eliminates some of the causative factors of trabecular obstruction. This procedure is not associated with significant complications and is very useful in reducing raised intraocular pressure.

**REFERENCES**


