IOSR Journal of Pharmacy
ISSN: 2250-3013, www.iosrphr.org
Ⅲ Volume 2 Issue 5 Ⅲ Sep-Oct. 2012 Ⅲ PP.08-11

Safety_and_efficacy_of_intraoperative_5_Fluorouracil_in_the_management_of_primary_Pterygium

Dr.SurekhaV.Bangal[1], Dr.Priyanka P. Dhaytadak[2]

1. Professor & Head, 2. Postgraduate student
Dept.Ophthalmology, Rural Medical College, Loni, Ahmednagar, Maharashtra State. 413736

Abstract—Pterygium is a fibrovascular proliferation of conjunctiva onto the cornea which leads to considerable visual impairment due to corneal astigmatism. Surgical excision is the only treatment; however recurrence continues to be a complication. Therefore, ant metabolites like Mitomycin C & 5Fluorouracil have been used as chemoadjuvant to reduce it. Present study was carried out to evaluate the efficacy of intraoperative use of 5 fluorouracil (5FU) in preventing recurrence of pterygium and to observe the complications related to 5FU. Twenty five cases with progressive primary pterygium, attending Ophthalmic OPD over a period of one year, were included in the study. 25 eyes underwent simple excision of pterygium followed by application of 0.5 ml (50mg/ml) 5Fluorouracil over bare sclera for 1minute. All case were followed up to 6months to observe the complications and recurrence. No serious side effect or complication was observed with 5 Fluorouracil. Overall recurrence rate was found to be 16 per cent.5FU was found to be safe and effective in the management of pterygium.

Keywords—Antimetabolites, chemo adjuvant, 5 Fluorouracil, progressive pterygium, recurrence.

I. INTRODUCTION

Pterygium is a wing shaped fibrovascular proliferation of conjunctiva onto the cornea. It is a degenerative condition and leads to considerable visual impairment due to corneal astigmatism.It is the commonest ocular condition seen in rural population of India. The aetiology has been linked to exposure to ultraviolet radiation, chronic irritation by dust, wind & other environmental factors. Pterygium can be unilateral or bilateral (Fig. 1). Surgical excision is the only treatment. The indications for surgery include reduced vision due to encroachment of the visual axis and astigmatism, chronic irritation, recurrence, restriction of ocular motility and cosmetic [1,2].Simple excision with bare sclera technique was the most popular surgical treatment. Because of high recurrence rate with this technique, which could be as high as 40%, various chemoadjuvantshave been tried to reduce it [2].Antimetabolites like Mitomycin C (MMC)&5 Fluorouracil (5FU) are used as chemoadjuvants in the treatment of pterygium.

5FU isfluorinated analogue of pyrimidine, originally approved by FDA for the treatment of skin cancer and adenocarcinoma. It inhibits mitosis, significantly of fibroblasts by interfering the DNA synthesis. It is being used to prevent bleb scarring in Glaucoma filtering surgery and in pterygium surgery[3,4]. 5FU is cheap, easily available, relatively safe & associated with mild side effects like superficial punctate keratitis, conjunctival hyperaemia.Present study was carried out to evaluate the efficacy of intraoperative use of 5FU in preventing recurrence of pterygium and to observe the complications related to 5FU.

II. MATERIAL AND METHODS

A prospective observational study was conducted at Department of Ophthalmology, Pravara Rural Hospital, Loni, Maharashtra over a period of one year from August 2010 to July 2011.

Total 25 eyes were included in the study after meeting the selection criteria.

2.1 Inclusion criteria:Cases above the age of20 years and primary progressive pterygium were selected
2.2 Exclusion criteria:Cases having atrophic pterygium, recurrent pterygium, dry eye, chronic conjunctivitis, ocular infection were excluded from the study.

Information was obtained from the cases using a structured questionnaire regarding name, age, sex, occupation, duration of symptoms, history of previous pterygium surgery. Visual acuity, refraction, ocular motility, intraocular pressure, patency of lacrimal passages and fundus examination findings were noted.Pterygium induced visual impairment was defined as visual acuity less than 6/18 on Snellen's chart.Slit lamp biomicroscopy examination was done to know the location, extent & morphology of pterygium. Schiermer's test was done in all cases to rule out dry eye. Routine investigations were done. All cases were put on antibiotic drops one day prior to surgery.Written & informed consent was obtained from all cases.

Procedure was done under surface anaesthesia using topical proparacaine eye drops. Simple surgical excision was done.Cotton bud soaked with 0.5ml of 5FU(50 mg/ml) was placed over bare sclera for one minute, protecting the neighbouring cornea & conjunctiva followed by thorough irrigation with balanced salt solution to prevent further contact of 5FU with surrounding ocular tissues.Superior & inferior conjunctiva was approximated with 9-0 nylon to cover the bare sclera. All cases were treated postoperatively with combination of topical 0.5% chloramphenicol & 0.1% dexamethasone four times a day. Conjunctival sutures were removed on 7th post-op day. All case were followed for 7 days, 1month, 3months & 6months to observe for postoperative complications and recurrence.

Recurrence was defined as postoperative fibrovascular growth more than 1mm onto the cornea which was observed on a slit lamp biomicroscope.

III. RESULTS

Majority of the cases were in the age group of 30 and 40 years with male preponderance (TABLE 1). Most of the cases had an outdoor occupation. Only one case had temporal pterygium. Pterygium induced visual impairment was observed in 52% of cases (TABLE 2), which was the most common indication of surgery.
Chronic irritation and watering was seen in 32% cases and was the second most common reason for surgery (TABLE.3).
Recurrence of pterygium was seen in 4 cases (16%) within 6 months of surgery (Fig.2). All cases had conjunctival hyperemia in early postoperative period which responded to topical steroids (Fig.3). Suture granuloma was seen in two cases (Fig.4). There was no serious ocular complication related to 5FU (TABLE 4).

Table 1: Age distribution of cases

Sr.No.	Age group (years)	No.of cases	Percentage
1	20-30	03	12
2	31-40	10	40
3	41-50	07	28
4	51-60	05	20
	Total	25	100

Table 2: Pre-operative Visual acuity

Sr.No.	Visual acuity	No.of cases	Percentage
1	More than 6/18	12	48
2	Less than 6/18	13	52
	Total	25	100

Table 3: Indications of pterygium excision

Sr. No.	Indications	No. of eyes	Percentage
1	Reduced vision	13	52
2	Chronic irritation and watering,	08	32
3	Cosmetic	04	16
	Total	25	100

Table 4: Postoperative complications

Sr. No.	Complications	No.of eyes	Percentage
1	Recurrence	O4	16
2	Conjunctival hyperemia	25	100
3	Suture granuloma	02	08
4	Superficial punctate keratitis	none	00
5	Scleral ulceration	none	00

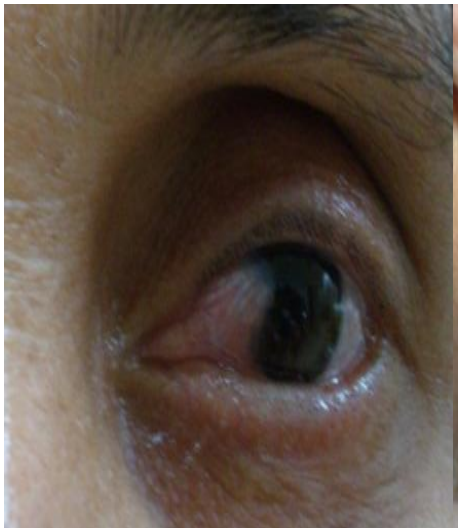

Figure 1.Primary pterygium

Figure 2. Recurrent pterygium

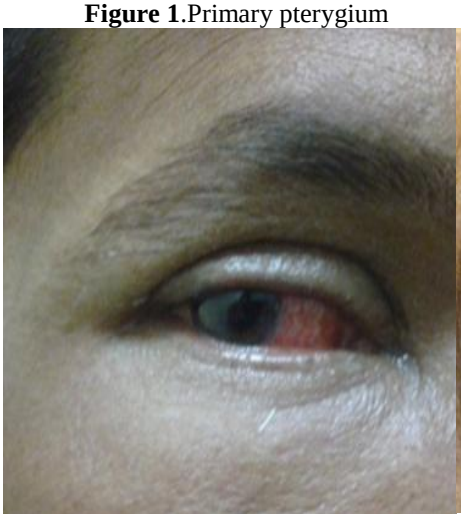

Figure 3.Conjunctival hyperemia

Figure 4. Suture granuloma

IV. DISCUSSION

Prevention of recurrence of pterygium after its surgical excision has always been a challenge for treating surgeon. Despite various innovative procedures, recurrence continues to be a complication[1,2]. Conjunctival autograft was reported to be most effective method with low recurrence rate. However, it has several disadvantages like complicated surgical technique, prolonged operating time, postoperative discomfort and suture related complications[2]. Therefore,Simple excision of pterygium with application of chemoadjuvats is becoming popular nowadays.

Recurrence has been attributedto fibroblast proliferation and their migration. Therefore,the use of anti-fibroblast agents-MMC & 5FU has been common in the treatmentof pterygium.Serious vision threatening complications such as scleral melting, corneal perforation, secondary glaucoma, cataract have been noted with the use of MMC[5,6]. However, very few, minor and non-serious complications are noted with the use of 5FU.
5Fluorouracil is one of the older ant metabolite which have been in use to treat skin cancer & variety of adenocarcinomas. It is a fluorinated analogue of pyrimidine with ability to inhibit tissue proliferation of fibroblasts significantly. It binds the enzyme thymidilatesynthetase& thus interferes with DNA synthesis.In ophthalmology,5FU is used to prevent bleb scarring in Glaucoma filtering surgery with satisfactory results[3,4]. In vitro studies have shown that a single exposure to 5FU considerably delays the proliferation of human ocular fibroblasts in cell cultures [4].

There are very few studies that investigated the efficacy of 5FU in pterygium. However, the recurrence rate observed in our study is slightly higher to recurrence (14%) observed by Akarsu et alfrom combined intraoperative & postoperative injection of 25mg/ml of 5FU [7] and 11.4% recurrence observed by C O Bekibele et al [8]. Maldonado MJ et al observed recurrence rate of 36% with intraoperative application of 10 mg/ml 5FU for 5 minutes, and concluded that low dose 5FU is inefficient in preventing recurrence of pterygium [9]. Prabhasawant et al reported 7.7% recurrence rate with intralesional injection of 5FU [10].

As in our study,Akarsu et al also found conjunctival hyperemia in all eyes treated with 5FU,during early post-op period. Superficial punctate keratitis was observed in all cases byAkarsu et al. However, we did not find any case of superficial punctate keratitis in our study probably because of protecting the cornea intraoperatively while applying 5FU. C O Bekibele et al observed suture granuloma in 11.4% cases as compared to 8 % cases in our study.

V. CONCLUSION

Single intraoperative application of 5FU is most effective in preventing the recurrence of pterygium and safe with minimal ocular side effects.

REFERENCES

[1]. William Townsend, Pterygium, in *The Cornea*(USA: Churchill Livingstone 1988) 461-483.
[2]. Christopher Y. Pterygium, in *Corneal surgery*(4th ed. MOSBY Elsevier 2009) 187-198.
[3]. Ashok Garg& Suresh Pandey.*Textbook of Ocular Therapeutics.*2nd Edition
[4]. BruceC,Henderson,MD. 5Fluorouracil: Ophthalmic use. Ophthalmology*Clinics of North America1989;2(1):131-1395.*
[5]. Tsai, Lin JM, Shy JD. Acute scleral thinning after pterygium excisionwith intraoperative mitomycin C: a case report. *Cornea 2002;21(2):227-9.*
[6]. Rubinfeld RS, Pfister RR, Stein RM, et al. Serious complications of topical mitomycin C after pterygium surgery. *Ophthalmology 92:1647-1654, 1992*
[7]. Akarsu,Cengiz MD, et al. 5FU As Chemoadjuvant For Primary PterygiumSurgery:Preliminary Report. *Cornea 2003;22(6):522-526.*
[8]. C O Bekibele, A M Baiyeroju, B A Olusanya, T S Oluleye. Pterygiumtreatmentusing 5FU as adjuvant treatment compared to conjunctiva autograft. *Eye (2008) 22,31-34.*
[9]. Maldonado MJ, et al. Inefficiency of low intraoperative 5FU in the treatment of primary pterygium.*Arch Ophthalmol 1995; 113: 1356.*
[10]. Prabhasawant P, et al. Efficacy of subconjunctival 5FU and triamcinolone injection in impending recurrent pterygium. *Ophthalmology 2006; 113: 1102*