

ORIGINAL ARTICLE

Intra-Operative Use of 5-Fluorouracil in Pterygium Surgery: A Comparative Study

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ABSTRACT

Purpose: Evaluate the efficacy and safety of intraoperative application of 5-Fluorouracil in pterygium surgery and the recurrent pterygium postoperative.

Materials and Methods: 240 eyes of 120 patients with bilateral primary pterygium were operated. One hundred twenty eyes had 5-FLU (25 mg/ml) applied intraoperatively on a sponge for five minutes. One hundred twenty contralateral eyes served as controls.

Results: After a follow-up of 90 days, 7 (5.83%) recurrences of the eyes which had 5-FLU applied intraoperatively were observed. In the control eyes, 25 (25.5%) recurrences were observed. Complications such as keratitis and lid edema were common in both groups.

Conclusion: This study suggests that antifibroproliferative therapy with intraoperative sponge 5-FLU is effective and safe. Its use may be a useful adjunct in primary pterygium surgery.

KEYWORDS: 5-Fluorouracil, Conjunctiva, Antimitotic, Antifibroproliferative, Mitomycin C, Cornea

INTRODUCTION

The pterygium is characterized by a growth of fibrovascular tissue which invades the cornea from the bulbar conjunctiva.^{1,2} The symptoms are quite variable from eye irritation and itching to change in visual acuity due to irregular astigmatism.³

The simple pterygium resection of pterygium is marked by a highly variable rate of recurrence (30 to 89%) and complications related to drug therapy.³ The rate of recurrence in techniques with application of mitomycin C in the preoperative ranges around 4%, while that in conjunctiva autologous transplant⁴ ranges around 2–7%.

The Mitomycin C (antimitotic drug) presents complications and therefore should be used with strict criteria. Pimentel et al. demonstrated, in a series of 76 eyes submitted to filtering surgery with mitomycin C, a high incidence of complications such as shallow anterior chamber in 25% of cases, hyperfiltration in 18.45%, cataract in 10.5%, and displacement of the choroid in 9.2%.⁵

The 5-fluorouracil (5-FLU) is another widely used antifibroblastic in filtering surgeries in order to inhibit

the healing of the scleral flap, compromising the surgical result. The use of postoperative pterygium excision has been described and currently the use of intra-operative has been used with a recurrence rate of 3.6%.^{6–10}

Despite showing similar histopathological changes, 5-FLU has advantages if compared to mitomycin C, with lower rates of vascular and epithelial toxicity, ischemia, conjunctival, scleral thinning, and low cost.¹¹

The objective of this study was to compare the pterygium resection with flap rotation in one eye and use of a 5-FLU intraoperative in the contralateral eye submitted to the same procedure.

MATERIALS AND METHODS

A prospective study was performed with 120 patients (240 eyes) who underwent bilateral surgical excision of pterygium at the Reference Centre for Ophthalmology (CEROF/HC/UFG).

The study protocol informed age, sex, race, and visual acuity with the best correction in the

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preoperative and postoperative history of previous surgery (recurrence), intraoperative complications, and postoperative evolution.

Patients with bilateral pterygium were selected in order to compare resection with flap rotation in one eye and the same technique involving the use of 5-FLU intraoperatively in the contralateral eye. The choice of the eye in which the 5-FLU was to be used was random. All patients were instructed about the treatment to which they would be submitted and signed an agreement term. The present study was approved by the Ethics Committee of Clinical Hospital of the Federal University of Goias.

The classification proposed was used by Garrido et al.¹² to examine the types of pterygium. As to the length: level I - growth of 2.0mm beyond the limbus; level II - an increase from 2.0 to 3.5mm beyond the limbus; level III - growth above 3.5mm beyond the limbus.

As for the macroscopic aspect: atrophic type - pterygium with sparse vessels, not elevated; fleshy type - pterygium with engorged vessels and elevated.

The operative technique consisted of: peribulbar anesthesia with lidocaine hydrochloride at 2% (Crystal®) associated with the bupivacaine hydrochloride at 0.5%, both without vasoconstrictor (Crystal®); removal of the pterygium head by the technique of plucking, removal of residual tissue with scalpel blade n° 15. Block excision and conjunctival application of a sponge soaked in the solution of 5-FLU (Roche® 25mg/ml) in the corneal-scleral bed for five minutes, and washing with 0.9%. Rotation flap top with episcleral two points and solid points anchored with absorbable braided wire (Vicryl® 7.0). Applications of collyrium of polymyxin B sulfate, neomycin sulfate, and dexamethasone (Maxitrol®) followed by occlusive dressing for 24 hours. The same surgical technique was performed in the contralateral eye without the application of antimetabolic.

Polymyxin B sulfate collyrium was used in the postoperative, neomycin sulfate dexamethasone (Maxitrol®) six times a day for 30 days. Patients were evaluated on the first, seventh, twenty-first, sixtieth, and ninetieth days after surgery.

In this study, the projection of vessels on cornea was considered as recurrent pterygium.

RESULTS

The patients' ages ranged from 48 to 82 years with an average of 50.8 years, 70 patients of whom (58.33%) were female.

All pterygium were primary, 142 (59.2%) of the level II; 68 (29.3%), level III; and 30(12.5%), level I. In 172 eyes (71.6%), pterygium was the fleshy type and in 68 (28.4%) atrophic type (Table 1).

There was no decrease in visual acuity with best optical correction after surgery in any patient.

On the first day, keratitis was observed in 73 (60.83%) eyes in which the 5-FLU was used and eyelid edema

in 26 (21.66%). On the seventh day there was wound dehiscence in 27 eyes (22.5%). On the sixtieth day there was a recurrence in seven eyes (5.83%) (Table 2).

On the first postoperative day, keratitis was observed in 58 eyes (48.3%) untreated with 5-FLU and eyelid edema in 26 (21.66%). On the seventh day no changes were observed. On the sixtieth postoperative day, it was observed that 25 eyes (20.83%) showed recurrence with fibrovascular tissue over the cornea (Table 3).

DISCUSSION

The 5-FLU inhibits proliferation of fibroblasts acting selectively in the S phase of cell cycle. Its antimetabolic action inhibits the formation of DNA, acting only in dysplastic epithelium.¹³

An attenuation of conjunctival epithelium, stroma with loosely organized collagen, few blood vessels and rare inflammatory cells in histopathological

TABLE 1 Distribution of pterygium according to the characteristics.

Characteristics Size	Eyes	%
level I	30	12.5
level II	142	59.2
level III	68	28.3
TOTAL	240	100%
Type		
Atrophic	68	28.4
Fleshy	172	71.6
TOTAL	240	100%

TABLE 2 Complications after surgery in eyes treated with 5-fluorouracil.

Changes	Postoperative days					Total*
	1	7	21	60	90	
Keratitis	73	-	-	-	-	73
Edema of eyelid	26	-	-	-	-	26
Wound dehiscence	-	27	-	-	-	27
Ischemia	-	-	-	-	-	-
Recurrence	-	-	-	7	-	7
TOTAL	99	27	-	-	-	133

* Eyes

TABLE 3 Postoperative complications in untreated eyes with 5-fluorouracil.

Changes	Postoperative days					Total*
	1	7	21	60	90	
Keratitis	58	-	-	-	-	58
Edema of eyelid	15	-	-	-	-	15
Wound dehiscence	-	-	-	-	-	-
Ischemia	-	-	-	-	-	-
Recurrence	-	-	-	25	-	25
TOTAL	73	-	-	25	-	98

*Eyes.

examinations of the conjunctiva of patients undergoing intraoperative 5-FLU¹⁴ were observed.

The option of treating only one eye with 5-FLU, leaving the contralateral eye as a control, was made so that the two groups were subjected to the same individual predisposing factors such as the dominant family character that can influence the onset of recurrences.¹⁵

The high rate of keratitis observed in the immediate postoperative period could be explained by the use of the pullout technique associated with delamination of the epithelial surface.

The eyelid edema, observed in eyes treated and untreated with 5-FLU, may have occurred because of the keratitis.

There were seven (5.83%) cases of recurrence in eyes treated with 5-FLU. However, the relapse rate in untreated eyes with 5-FLU was 20%. Schellini *et al.* noticed, in 26 patients, pterygium excision with flap rotation and use of 5-FLU intraoperatively with a recurrence rate of 3.6%.¹⁰ There was no significant statistical difference in the number of relapses between the two studies. The fact that they had not been treated in both groups of our study, prior recurrent pterygium may have contributed to the low rate of recurrences in the group with 5-FLU, although we found a 20% rate of recurrence in the group without the 5-FLU.

Adjuncts to surgery such as the use of beta-therapy, mitomycin C, and oncotitepa dramatically reduce the number of relapses. However, the incidence of complications associated with the use of beta-irradiation therapy and of antifibroblastic substances (mitomycin C and oncotitepa), especially late scleral necrosis, has been relatively frequent.¹⁶⁻¹⁸

CONCLUSION

There were no major complications during the study presented when 5-FLU was being used. This leads us to suggest that a single application of preoperative 5-fluorouracil 25 mg/ml for 5 minutes is effective and safe in the treatment of primary pterygium. The use of 5-FLU during pterygium surgery can reduce its recurrence.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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