Original Article

Recurrence of Pterygium with Conjunctival Autograft Versus Mitomycin C

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Purpose: To compare the recurrence rate of conjunctival autograft and mitomycin C adjuvant in pterygium excision.

Material and Method: This quasi experimental study was conducted in the department of Ophthalmology, Liaquat University of Medical & Health Sciences Jamshoro / Hyderabad, from November 2004 to April 2006.

One hundred twelve eyes of 105 patients with primary and recurrent pterygium were treated with conjunctival autograft and mitomycin C 0.02% intraoperatively for 5 minutes, under the topical anesthesia. Patients were followed postoperatively for a period of 6-12 months to find the recurrence of pterygium and complications. All the surgeries were performed by one surgeon.

Result: One hundred twelve eyes were randomized to receive conjunctival autograft (CAG n=70) and mitomycin C (MMC n = 42). There were 4 recurrences (5.7%) in the CAG group and 8 recurrences (19%) in the MMC group. There was statistically significant difference in the recurrence rate between the two groups. The post operative complications in MMC were two punctuate epithelial keratitis, two conjunctival cysts, one conjunctival granuloma and one dellen. No significant complication was encountered in conjunctival autograft group.

Conclusion: Simple excision of pterygium followed by conjunctival autograft has the lowest recurrence rate and minimal incidence of complications as compared to intraoperative use of mitomycin C.

Pterygium is a fibrovascular wing shaped encroachment of conjunctiva on to the cornea[1]. Although the pathogenesis remains obscure, the ultraviolet radiations (UVR), especially UVR-A and UVR–B (290-400 nm) is considered the most dangerous[2-4]. It is also more frequent in hot, dry, windy, dusty and smoky environments[5,6]. There is also a hereditary factor that may be responsible[7].

The main histopathological changes in primary pterygium are elastotic degeneration of conjunctival collagen[8]. The complaints which it may give rise are foreign body feeling, visual loss due to corneal astigmatism or growth over the pupil and cosmetic problems[9]. Anti inflammatory drugs and lubricants have an important role minimizing the patients discomfort but do not cure the disease. Ablation with erbium, YAG Laser[10] and smoothening the corneal surface with excimer[11] laser has been tried but the results were not encouraging. Surgical removal is the treatment of choice. Recommended surgical management includes simple excision with or without adjunctive measures like postoperative Beta

irradiation, thiotepa drops, intraoperative and postoperative mitomycin C and various techniques of conjunctival grafting[12-17]. After surgical removal whichever method is used there are still many recurrences. However autologous conjunctival grafting seems to be the best method, giving both low recurrence rate and high safety[18-20]. Kenyon et al[21], first described a conjunctival autograft in 1985. They reported a recurrence rate of 5.3%, and infrequent and relatively minor complications. The primary disadvantage of this technique is the prolonged operative time required when compared to the bare sclera technique. These disadvantages are out weighted; however by the lack of sight threatening complications and the relatively low recurrence rate, this procedure gained popularity in many centers[21]. Kunitomo and Nori[22] were the first to report the promising effect of mitomycin C on the recurrence rate of pterygium. The application of intraoperative 0.02.% mitomycin C for the 5 minutes is efficient in reducing the recurrence rate to a minimum[23]. In our study we compared the recurrence rate of two different techniques.

MATERIAL AND METHODS

One hundred twelve eyes of 105 patients with primary and recurrent pterygium were registered at the tertiary referral center, department of Ophthalmology, Liaquat University of Medical and Health Sciences, Jamshoro, Hyderabad. Patients were randomized in to two groups. Group 1 (to receive Conjunctival autograft) and Group 2 (to receive intraoperative 0.02% mitomycin). These patients had been questioned and medical data reviewed in details that none had major systemic disease such as collagen vascular disorder, diabetes mellitus. Complete ocular examination including visual acuity, intraocular pressure, extraocular movements, biomicroscopy documentation of pterygium size and dilated fundoscopy was performed to assure that none of them had major eye disease such as dry eye, cicatrical pemphigoid, glaucoma or vitreoretinal disease. All patients were followed for 6 to 12 months to assess the recurrence rate and complications. The ocular surface was anesthetized in all patients with topical installation of proparacaine hydrochloride 0.5% in combination with an additional sub conjunctival injection in the bed of pterygium on the bulbar side with 0.5 ml of 2% lidocane hydrochloride with 0.001% adrenaline. The complete excision of the head of the pterygium from the cornea was done by Bard Parker 15 No blade and the body of pterygium was dissected and excised by conjunctival scissors. In recurrent pterygium a thorough dissection was done to remove adherent fibrovascular tissue from scleral surface avoiding damage to rectus muscle.

In group 1 (CAG) area of the bare sclera was measured after pterygium excision. A free conjunctival graft was harvested from the superior conjunctiva. Dissection began from fornix to limbus. The graft was flipped over on the cornea and tenon's attachment at limbus was meticulously dissected. The flap was then excised taking care to include the limbal tissue. The graft was then moved on to the scleral bed maintaining limbus to limbus orientation. The four corners were anchored with episcleral bites using 8/0 vicryl suture.

In group 2 (MMC), intraoperative mitomycin (0.02%) was applied to the bare sclera for 5 minutes. The site of application was then thoroughly irrigated with at least 100ml of ringer lactate solution. The conjunctiva peripheral to the excised pterygium was undermined and the edges were sutured 2-3 mm from the limbus.

Post operative topical combination of corticosteroid antibiotic ointment was used and pad was applied for 24 hours. Antibiotic and corticosteroid were used 4 times a day for a month and the tapered during the following 2-3 months. Follow-up visits were scheduled for post operative days 1,7,14, 30 and then every 2 months. The recurrence was defined as post operative fibrovascular regrowth crossing the corneoscleral limbus by 1.0 mm or more and this constituted treatment failure. All the information was filled on a performa. Data was analyzed on SPSS version 10.0.

RESULTS

We analyze the recurrence rate of two different surgical procedures for pterygium excision. The demographic and the clinical details are summarized in table 1. A total of 112 eyes (70 CAG, 42 MMC) of 105 patients (70 CAG, 35 MMC) were studied. There were 4 (5.7%) recurrences in the group 1 (CAG),one at 2 months , two at 6 months and one at 8 months (table 2). There were 8 (19%) recurrences in group 2 (MMC), three within 4 months, two at 5 months, two at 6 months and one at 9 months. The difference in recurrence rate was statistically significant. No significant complications were noted in group 1 (CAG) except varying level of discomfort, foreign body sensation, tearing, and redness for some period in few patients. There were two punctate epithelial keratitis, two conjunctival cysts, one granuloma and one dellen

in group 2 (MMC). No scleral thinning, necrosis, perforation or any other visually significant complication was encountered in either group.

DISCUSSION

In the treatment of pterygium various surgical techniques have been employed. The main problem encountered after various pterygium treatment modalities concerns the unpredictable rates and timing of recurrences [24]. A recurrent pterygium can be associated with decreased visual acuity due to involvement of visual axis and /or irregular astigmatism, extraocular motility restriction and symblepharon formation[25]. The simplest technique of bare sclera excision alone proved unsatisfactory because of high recurrence rates (30-70%)[26].Adjunctive treatment after bare sclera excision with Beta irradiation reduced recurrence rates to as low as 0.5%-10%[27], but was associated with significant complications such as scleral necrosis.

In 1985, Kenayn et al [21] published report describing conjunctival autografting as a promising technique in the treatment of pterygium. They documented the recurrence rate of 5.3% in the primary pterygium group. Since then a number of papers on the success of conjunctival grafting have been published with various success rates. It is believed that surgical trauma and subsequent postoperative inflammation activated subconjunctival fibroblasts, the proliferation of fibroblast and vascular cells and deposition of extracellular matrix proteins which in turn contribute to the pterygium recurrence[28]. Compared with the bare sclera method, conjunctival autograft is more technically demanding procedure, surgeon factors such as experience, techniques etc may have a profound influence on the recurrence rate. More over conjunctival grafts including limbal epithelium generally yield better results because it will help to restore its barrier function[29].

In 1998, lewallen[30] published report of a randomized trial of the conjunctival autografting technique for pterygium removal. She documented a lower recurrence rate (21%) in grafted cases compared with controls done by the bare sclera technique (37%). Riodan-Eva et al[31] of Moorefield Eye Hospital London supported lewallens finding when they reported a statistically significant reduction in recurrences rate following conjunctival autografting for pterygium. They quoted a probability of recurrences of 14% with this procedure at 36 months after surgery. In 2005 Fahmi et al[32] reported 13.3% recurrence rate with conjunctival autograft. In our study recurrence rate was found to be 5.7%.

An alternate to conjunctival graft technique to improve out come is use of mitomycin C. Mitomycin C is an alkylating antineoplastic agent produced by strains of streptomyces caespinosus which inhibits synthesis of DNA, RNA and proteins[33]. The Current regime of mitomycin C is 0.02% for 5 minutes have been found to be effective[34, 35]. In this series the MMC recurrence rate was 19% in compare with 38% reported by Chen et al[19] and 10.5% by Maning et al[36] with the application of 0.4 mg / ml for 3 minutes.

Ma et al (post operative MMC) and Sharma et al also compared MMC with conjunctival graft but neither showed any statistical difference[28,37]. However failure of these studies to show any difference between MMC and conjunctival autograft. The results of our study reporting an advantage of conjunctival autograft over mitomycin C. Our results are compatible with national and international studies.

CONCLUSION

In conclusion simple excision of pterygium followed by conjunctival autograft has the lowest recurrence rate and minimal incidence of complications as compared to intraoperative mitomycin C.

Table 1: Demographic and clinical data of patients in group 1 and group 2.

Groups (n)	Age range (Years)	Mean Age (Years)	Sex n (%)		Laterally n (%)		Population Type n (%)		Pterygium Type n (%)	
			Male	Female	Right	Left	Rural	Urban	Primary	Recurrent
CAG (70)	20-70	44.6	42 60)	28 (40)	46 (66)	24 (34)	48(69)	22 (31)	52 (74)	18 (26)
MMC	26-62	43	25 (60)	17 (40)	26 (62)	16(38)	26 (63)	16 (37)	31 (74)	11 (26)

(42)										
CAG+MMC (112)	20-70	44.3	67 (60)	45(40)	72 (64)	40(36)	74 (67)	38 (33)	83 (74)	29 (26)

Table 2: Number of recurrences of CAG v MMC

	CAG (n = 70)	MMC (n = 42)	AG+MMC (n = 112)
2 months	1	0	1
4 months	0	3	3
6months	2	4	6
8months	1	0	1
10 months	0	1	1
1 year		0	0
Total	4(5.7)	8(19)	12(10.7)

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REPORTING VISUAL ACUITIES

Table of Equivalent Visual Acuity Measurements

Snellen Visual Acuities				
4 Meters	**6 Meters**	**20 Feet**	**Decimal Fraction**	**LogMAR**
4/40	6/60	20/200	0.10	+1.0
4/32	6/48	20/160	0.125	+0.9
4/25	6/38	20/125	0.16	+0.8
4/20	6/30	20/100	0.20	+0.7
4/16	6/24	20/80	0.25	+0.6
4/12.6	6/20	20/63	0.32	+0.5
4/10	6/15	20/50	0.40	+0.4
4/8	6/12	20/40	0.50	+0.3
4/6.3	6/10	20/32	0.63	+0.2
4/5	6/7.5	20/25	0.80	+0.1
4/4	6/6	20/20	1.00	0.0
4/3.2	6/5	20/16	1.25	-0.1
4/2.5	6/3.75	20/12.5	1.50	-0.2
4/2	6/3	20/10	2.00	-0.3

From Ferris FL III, Kassoff A, Bresnick GH, Bailey I. New visual acuity charts for clinical research. Am J Ophthalmol 1982; 94: 91-96.