

Management of Recurrent Pterygia

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Abstract: **PURPOSE:** The objective of this study was to evaluate the postoperative outcomes of different surgical techniques with adjunctive therapy for the management of recurrent pterygia. **MATERIALS and METHODS:** Twenty eyes of twenty patients (7 females and 13 males, mean age 42.3 +/- 9.6 years) operated on for recurrent pterygia at the Research Institute of Ophthalmology, were recruited in this study. Patients were randomized into two groups: In group 1, ten eyes of ten patients were done with conjunctival autograft and in group 2, ten eyes of ten patients were done with limbal conjunctival autografting. All eyes received intraoperative mitomycin C 0.01% for 3 minutes applied to the bare sclera at the time of the operation. The site of application of mitomycin C was thoroughly irrigated with balanced salt solution. All eyes were followed up every month for 12 months. **RESULTS:** After a mean postoperative follow up of 12 months, only one eye had a recurrence after 4 months in the limbal conjunctival autograft group and there were two eyes with recurrence after 2 and 4 months in the conjunctival autografting group ($p = 0.027$). No severe side effects appeared during the follow up period. **CONCLUSION:** This study confirms the efficacy of adjunctive therapy in improving the success rate after recurrent pterygium surgical excision. There was no difference between the two surgical procedures in the two groups, we also found no serious complications from using a low concentration (0.01%) of mitomycin C which was effective also in prevention of recurrences.

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1. Introduction:

Pterygium is a common external eye disease seen more frequently in tropical and subtropical areas due to exposure to ultraviolet sunlight. The main histopathological change in primary pterygium is elastodysplasia and elastodystrophy of subepithelial connective tissue,Austin et al, (1983)

Indications for surgical excision include impending or manifest visual loss due to involvement of the central cornea, irregular astigmatism, restriction of ocular motility, atypical appearance leading to concerns of squamous neoplasia,Hirst (2003)Surgical treatment of pterygium is directed at excision, prevention of recurrence, and restoration of ocular surface integrity. Also the main concern of simple excision of pterygium is the high recurrence rate as simple excision of the pterygium carries a high recurrence rate ranging from 24-89%, Jaros and Deliuse (1988). As an attempt to prevent recurrence adjunctive therapies are to be considered. These include antimetabolites as mitomycin C, radiotherapy, conjunctival or limbal conjunctival autograft and amniotic membrane graft ,Kenyon et al., (1985).

The addition of mitomycin C of various concentrations has been reported to be effective in preventing recurrence ,Lam et al.,(1998)

Unacceptable recurrence rates led to abandonment of the excision with bare sclera technique with widespread acceptance of conjunctival autografting, Troutbeck and Hirst (2001)

Limbal conjunctival autografting using stem cells is reported to be an effective alternative adjuvant to lower the recurrence rate of the pterygium ,Manning et al.,(1997). As the limbal epithelium acts as a junctional barrier to conjunctival overgrowth and pterygium is considered to represent a “local limbal deficiency” Tseng (1989). Also the inclusion of limbal epithelium in conjunctival graft would restore the barrier function of the limbus. Recent studies have reported the effectiveness of limbal conjunctival autograft transplantation (LCAG) in the prevention of pterygium recurrence, Rao et al, (1998); Gris et al.,(2000) ;Al Fayez (2002)

The aim of this study is to determine the recurrence rate after two surgical procedures of

pterygium excision and conjunctival autografting with or without limbal stem cell transplant.

2.MATERIALS and METHODS:

2.1.Materials:

2.1.1. Sample of the study:

Twenty eyes of twenty patients (7 females and 13 males, mean age 42.3 +/- 9.6 years) operated on for recurrent pterygia at the Research Institute of Ophthalmology, were recruited in this study.

Patients were randomized into two groups: in group 1, ten eyes of ten patients were done with conjunctival autograft and in group 2, ten eyes of ten patients were done with limbal conjunctival autografting.

2.1.2.Drugs:

Postoperative topical antibiotic and steroid therapy was used 4 times a day for 2 weeks and then 2 times a day for another 2 weeks for both groups.

2.2.Methods:

2.2.1. Surgery operations :

All surgeries were done under local anaesthesia. All eyes received intra-operative mitomycin C 0.01% for 3 minutes applied to the bare sclera at the time of the operation. The pterygium body was thoroughly removed and the pterygium head was undermined and removed by dissection or avulsion to reach the clear corneal lamellae. The site of application of mitomycin C was thoroughly irrigated with balanced salt solution while preparing the conjunctival autograft or the limbal conjunctival graft from the temporal conjunctiva by marking the area of conjunctiva to be incised and then injecting saline solution under the conjunctiva using an insulin syring to separate the conjunctiva from the tenon followed by excision of the graft. The conjunctival autograft was then sutured to the conjunctiva defects with the same orientation with 8/0 Vicryl interrupted sutures. In group 2 while harvesting stem cells at the limbus a 1 mm of the clear cornea has to be taken with conjunctiva and graft margins were secured to the recipient site while stem cells aspect was sutured to the limbus with 2 interrupted 10/0 silk sutures. All eyes were followed up on the second day and one week postoperatively, then every month for another 12 months for the detection of early signs of recurrence and complications. Recurrence was defined as fibrovascular proliferation invading the cornea 1.5 mm; Lam et al.,(1989).

2.2.2. Statistical analysis:

Student T test was used to analyze recurrence rate and a P value less than 0.05 was considered significant.

3.Results:

After a mean postoperative follow up period of 12 months, only one eye had a recurrence after 4 months in the limbal conjunctival autograft group and there were two eyes with recurrence after 2 and 4 months in eyes with conjunctival autografting group ($p = 0.027$) with no recurrences in the rest of the eyes in both groups (Figure 1,2,3). Minimal complications as superficial punctate keratitis, redness and irritations to the eyes were noticed in the first postoperative days due to the use of mitomycin C which were resolved spontaneously. No severe side effects appeared during the follow up period.



Fig. (1) One year post pterygium excision with conj. autograft

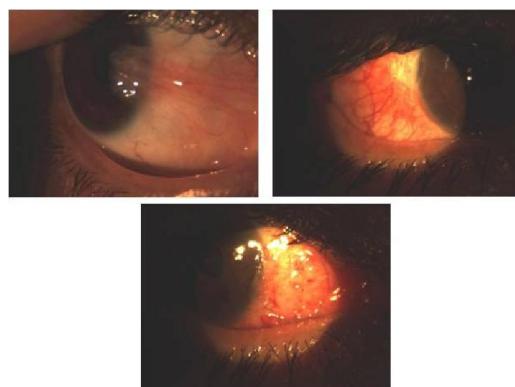


Fig. (2) Pre and post pterygium excision with limbal conj. autograft

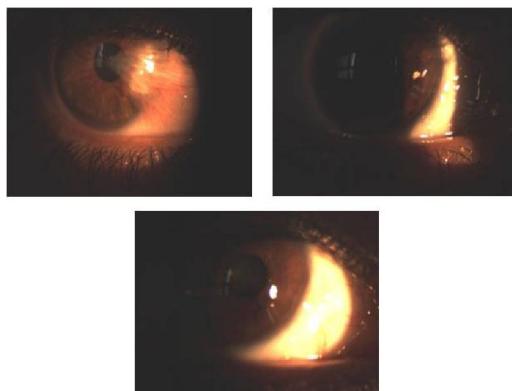


Fig. (3) Pre and post pterygium excision with conj autograft

4. DISCUSSION:

As regards the high recurrence rate after pterygium excision, adjunctive therapy is very essential in order to decrease the rate of recurrence.

Cases recruited in this study were recurrent cases that needed adjunctive therapy to decrease the rate of recurrences.

Recent studies have reported the effectiveness of limbal conjunctival autograft transplantation (LCAG) in the prevention of pterygium recurrence due to the theory that limbal stem cell deficiency lead to the progression of the pterygium limbal autograft with limbal epithelium in conjunctival graft would restore the barrier function of the limbus. Rao et al, (1998); Gris et al.,(2000) ;Al Fayed (2002).Limbal conjunctival autograft transplantation with recurrent pterygium was found to be a successful method to prevent recurrences in patients under 40 years of age with a recurrence rate of 13.3% after a mean follow up period of 10 months (Ranging 3-18 months) compared to 50% recurrence rate without limbal transplantation (control group) ,Guler et al, (2010)

In an attempt to decrease the recurrence rate, surgical time and post operative pain, the use of fibrin adhesive in primary pterygium surgery with conjunctival autograft was found to reduce the recurrence rate to 4.41% in comparison to 15.9% in the suture group, it also reduces the surgical time and the post operative pain when compared with suture groups ,Ratnalingam et al., (2010).

A recurrence rate of 4.75% with no signs of complications was found after limbal stem cells and conjunctival autograft transplantation ,Soliman and Bhatia (2009).

It was also proven that the procedure is an effective surgical technique in preventing pterygium

recurrence and it can also help in improving the best corrected visual acuity,Abdalla (2009).

Recurrent pterygium exhibits a more aggressive fibrovascular growth pattern leading to corneal and conjunctival scarring and limbal stem cell deficiency. Proper excision of pathological tissue with amniotic membrane transplantation and mitomycin C represents an alternative surgical method with good final outcome ,Jirásková and Rozsíval (2008).

In managing chronically recurring pterygium combined surgical procedure of pterygium excision with amniotic membrane transplantation, conjunctival limbal autograft and mitomycin C application seems to be beneficial,Sangwan et al., (2003).

If mitomycin C is contraindicated, inferior limbal conjunctival autograft appears to be safe and effective option in the management of recurrent pterygium,Wong et al.,(2000).

Mitomycin C is a potent cytotoxic agent that inhibits DNA synthesis resulting in all cycle arrest in the S phase.We used it in a low dose in a concentration of (0.01%) in an attempt to decrease the incidence of ocular surface complication.

Intraoperative mitomycin C has been shown to be highly effective in improving the success rate after recurrent pterygium surgical excision after a mean follow up period of 34-55 months a recurrence rate of 12.5% in the mitomycin group and 35.6% in the control group. The 24 and 48 month success rate were 89% and 83% in mitomycin treated groups and 66% and 63% in the other group respectively. No severe side effects during the follow up period. Superficial punctate keratitis appeared in the early postoperative period in only 25.5% of the cases, Mastropasqua et al., (1996).

Although the use of mitomycin C decrease the reccurence rate of pterygium, the ideal application method and the dose still remain controversial. A concentration of 0.02% mitomycin C is an effective treatment for the prevention of recurrent pterygium,Hosal and Gursel (2000).

It was also found that amniotic membrane closure and conjunctival autograft combined with mitomycin C are effective to prevent recurrence in the treatment of recurrent pterygium, Katircio luet al.,(2007).

Some authors found that conjunctival limbal autografting and amniotic membrane methods were more effective and safer than intraoperative mitomycin C ,Keklikci et al., (2008).

In a comparison between limbal conjunctival autograft transplantation versus mitomycin C with conjunctival flap in the treatment of recurrent pterygium surgery, both techniques showed similar recurrence rates ,Mutlu et al.,(1999).

Also, some authors found that in treating recurrent pterygium, simple excision and low-dose mitomycin C followed by limbal conjunctival autografted is a safe and effective way ,Nabawiet et al.,(2003).

Most of authors agreed about the treatment of recurrent pterygium as patients requires a more radical excision with a large autograft and the use of adjuncts such as mitomycin C ,Massaoutis et al., (2007).

Also some surgeons agreed that amniotic membrane graft was as effective as conjunctival autograft and mitomycin C in preventing pterygium recurrence ,Ma et al.,(2000).

Thus, it can be concluded that combined intraoperative mitomycin C, amniotic membrane graft and limbal conjunctival autograft are successful approaches for treating multirecurrent pterygia with severe symblepharon to restore the ocular surface integrity and prevent recurrence, Yao et al., (2006).

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