

## A PROSPECTIVE STUDY COMPARING DIFFERENT MODALITIES FOR THE MANAGEMENT OF PRIMARY PTERYGIUM

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### ABSTRACT

#### BACKGROUND

The histological and epidemiological characteristics of pterygium suggests that the UV radiation plays a role in the pathogenesis by producing a chronic inflammatory cellular infiltration with inflammatory oedema and cell-induced angiogenesis. Many surgical techniques and modifications have failed to prevent recurrent pterygium.

#### MATERIALS AND METHODS

The study included 238 eyes of 182 patients with primary pterygium. The patients were followed up for a period of 2 years. The patients were managed with different surgical techniques and were grouped into three categories. Group 1 patients were treated with excision and conjunctival rotation pedicle graft. Group 2 were treated with excision followed by conjunctival autograft. Group 3 were treated with excision followed by postoperative instillation of mitomycin-C (MMC) drops 0.02%. Age varied from 22-58 years. Male and female distributions were made equal in all 3 groups.

#### RESULTS

Complications noted were haemorrhage, chemosis, foreign body sensation and scleral melt. Complication rate noted in the groups were 16% in group 1, 7% in group 2 and 9% in group 3. A cosmetic blemish or regrowth of fibrovascular tissue was considered as recurrence. Recurrence rate in group 1 were 15%, group 2 were 9% and group 3 were 8%.

#### CONCLUSION

In this study, it was found that recurrence of pterygium was comparably less in groups that underwent conjunctival autograft and topical MMC treatment. However, conjunctival autograft is the preferred procedure over topical MMC due to complications associated with MMC treatment.

#### KEYWORDS

Pterygium, Complications, Recurrence, Conjunctiva, Autograft.

**HOW TO CITE THIS ARTICLE:** Kakkanatt CVA, Mohan S, Anand AF, et al. A prospective study comparing of different modalities for the management of primary pterygium. *J. Evid. Based Med. Healthc.* 2017; 4(84), 4929-4932. DOI: 10.18410/jebmh/2017/983

#### BACKGROUND

Pterygium is a pinkish triangular fibrovascular tissue of conjunctival origin, which usually extends over the nasal sclera on to the cornea and may eventually cover the pupil and obstruct vision.<sup>1</sup> Earlier, it was thought that pterygium is primarily a lesion of medial and lateral palpebral fissure mainly affecting people in the tropical region like fisherman and farmers who are exposed to excessive UV radiation (UV-B 320 nm to 286 nm) in the sunlight. But now, we know that pterygium can also occur in the inferior part of cornea as a result of focal trauma or infrequent blinking and it can also

*Financial or Other, Competing Interest: None.*

*Submission 26-08-2017, Peer Review 02-09-2017,*

*Acceptance 16-09-2017, Published 17-10-2017.*

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*DOI: 10.18410/jebmh/2017/983*



be seen quite frequently among factory workers due to chronic exposure to dust, dryness and infrequent blinking.<sup>2</sup> The histological and epidemiological characteristics of pterygium suggest that UV radiation plays a role in the pathogenesis by producing a chronic inflammatory cellular infiltration with inflammatory oedema and cell-induced angiogenesis.<sup>3</sup> The pathophysiology of pterygium is characterised by elastotic degeneration of collagen and fibrovascular proliferation with an overlying covering of epithelium.<sup>1</sup> Structurally, a pterygium consists of an advancing head, a connecting neck and a wide body. It is mainly two types, degenerative and proliferative. Proliferative type shows greater degree of infiltration of inflammatory cells like lymphocytes and plasma cells with open vascular channels indicating type 1 hypersensitivity reaction, while degenerative type shows thickened conjunctival epithelium with more stromal collagen and hyalinisation with closed vascular channels and fibrosis. A pingueculum can be a precursor lesion to pterygium as it shows degeneration of the stromal collagen of conjunctiva

with thinning of overlying epithelium. But, once it develops a fibrovascular component, then it is considered as pterygium.<sup>3</sup>

Commonly accepted theory for the predominant nasal location of pterygium explains that it occurs because the sunrays passes laterally through the cornea and undergoes refraction and get focused over the limbal area. Passage of sunlight is unobstructed in the lateral side and gets focused on the medial side, while on the contralateral side shadow of the nose reduces the intensity of sunlight focused on temporal limbus.<sup>4</sup> Elliott in his study described that the other major factor that leads to pterygium formation is local drying of cornea and conjunctiva in the interpalpebral fissure due to tear film abnormalities. The study explains that tear film defects created by wind devitalises tissues of the medial third of palpebral fissure and allows actinic radiation to damage conjunctival and corneal epithelium.<sup>5</sup> Regrowth after surgical removal of primary pterygium resemble the primary lesion, but the pathogenesis is different. Many surgical techniques and modifications have been used to remove pterygium, but all these have failed to prevent recurrence.<sup>6,7</sup> Excision with conjunctival autograft has the advantage of placing the stem cells of limbal conjunctiva along the limbus of the required scleral bed.<sup>8</sup> Excision with conjunctival rotation pedicle flap has the advantage of preserving the blood supply of the graft at the cost of loss of the limbal stem cells.<sup>7</sup> Mitomycin C (MMC) is an anti-

metabolite produced by *Streptomyces caespitosus*. It has been used as an adjunctive treatment due to its ability to inhibit proliferation of fibroblasts.<sup>1</sup>

**MATERIALS AND METHODS**

Patients with primary pterygium with symptoms were examined in detail using slit lamp. Surgical treatment was indicated when fleshy pterygia actively grew and produced clinical symptoms. Mode of treatment studied were grouped into three. Group 1- Excision with conjunctival rotation pedicle graft. Group 2- Excision with conjunctival autograft. Group 3- Excision with postoperative instillation of MMC 0.02% twice a day for 5 days. Two hundred and thirty eight eyes of 182 patients were selected for the study and followed up for a period of 2 years. Complication and recurrence rates were noted during follow up visits. Commonly noted complications were haemorrhage, foreign body sensation, chemosis and scleral melt.

**RESULTS**

In the present study, data was collected from 238 eyes of 182 patients. This included 98 male patients and 84 female patients. The age distribution of patients (Figure 1) was between 22 and 58 with maximum patients falling between 31 to 40 years. Average age of patients was 34 years. Among the study groups, three different modalities of treatment were given (Table 1).

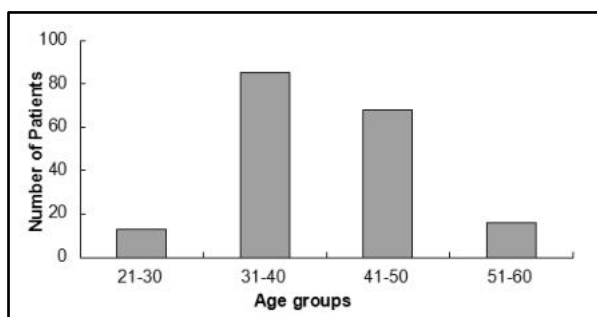
Treatment Groups	Treatment Given	No. of Cases (Eyes)
Group 1	Excision of pterygium with conjunctival rotation pedicle graft	92
Group 2	Excision of pterygium with conjunctival autograft	94
Group 3	Pterygium excision with postoperative instillation of mitomycin C 0.02% twice daily for 5 days	52

**Table 1. Treatment Modalities Provided**

Different complications were noted in all the three groups, which are summarised in Table 2. Pterygium excision with conjunctival autograft method had the least rate of complications. The most common complication found among all the groups was haemorrhage. The recurrence rates were also noted in all the groups (Table 2). Excision with postoperative instillation of MMC had the least recurrence rate of 8%. Least number of recurrences were seen in group 2 and 3, their difference was not significant (P = 0.86).

Treatment Group	Complications in Percentage	Commonly Noted Complications	Recurrence in Percentage
Group 1	16	Haemorrhage, foreign body sensation and chemosis	15
Group 2	7	Haemorrhage and foreign body sensation	9
Group 3	9	Haemorrhage and scleral melt	8

**Table 2. Complications and Recurrence Seen in Different Groups After Surgical Treatment**



**Figure 1. Age Distribution of Patients**

**DISCUSSION**

The present study was aimed to compare different techniques for the management of primary pterygium on the basis of two principle criteria, safety (ability to prevent complications) and efficiency (prevention of recurrence), as the complication and recurrence rates after surgery still remain as a challenge.<sup>9</sup>

The aetiology of pterygium recurrence is considered different from that of primary pterygium. Postoperative inflammation caused by surgical manipulation is thought to play a role in the recurrence by activating the

subconjunctival fibroblasts, which in turn proliferate and deposit extracellular matrix.<sup>10,11</sup> In the present study, the recurrence rate following pedicle rotation graft technique is high compared to other two groups, because in the conjunctival autograft technique, the limbal stem cells located in the graft tissue provides barrier effect in addition to contact inhibition of graft tissue for the growth of fibroblasts. Similarly, MMC being an antimetabolite, inhibits the proliferation of fibroblasts and helps to prevent recurrence to some extent.<sup>8,12</sup>

The study by Bazzazi et al aimed at comparing the results of the conjunctival autograft technique and minimally-invasive pterygium surgery in primary pterygium showed a recurrence rate of 11% in the conjunctival autograft group.<sup>13</sup> Kareem et al in his study on intraoperative instillation of MMC also showed a similar recurrence rate of 8% with minimal complications.<sup>14</sup> Ari et al in his study showed a recurrence rate of 20% in MMC group and 4% in conjunctival autograft group.<sup>15</sup> This is slightly different from the findings of the present study. McCoombes et al found a recurrence rate of 3.2% in patients undergoing pedicle rotation graft, which is much less than the recurrence rate in group 1 of the present study undergoing similar procedure. This maybe because in his study, McCoombes was only able to follow up 86% of his patients who underwent surgery for an average period of 1 year.<sup>16</sup>

Ma et al in his study showed that there were no major complications following conjunctival autograft procedure, but MMC group developed a case of infective scleritis.<sup>17</sup> MMC is a known alkylating agent that can be used preoperatively, intraoperatively or postoperatively for the treatment of pterygium. In our study, we did the bare sclera technique followed by postoperative application of 0.02% MMC 2 times daily for 5 days. The present study had a single case of scleral melt, which was managed conservatively. Oguz et al in his study describes the possible advantage of intraoperative technique with a recurrence rate of 15% over postoperative technique, which showed a recurrence rate of 20%.<sup>18</sup> This is higher than the recurrence rate of the present study. Variations in the findings from a given technique between different studies maybe influenced by factors like difference in the technique of different surgeons, variation in postoperative medications, age and geographic location of population being evaluated, duration of follow up period, etc.<sup>19</sup> Current data from different studies shows that the use of any one technique alone does not reduce recurrence as effectively as a combination of techniques like conjunctival autograft with MMC.

## CONCLUSION

In the present study, it was found that recurrence of pterygium was comparably less in groups that underwent conjunctival autograft and topical MMC treatment. But, conjunctival autograft is the preferred procedure over topical MMC due to complications associated with MMC treatment.

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