

Comparative study On the Outcome of primary Pterygium Surgery using Bevacizumab versus Mitomycin C.

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Abstract: Purpose: To Compare preoperative Subconjunctival Bevacizumab injection and Intraoperative Mitomycin C application On the Outcome of primary Pterygium Surgery. **Patients and methods:** Prospective, Randomized, Comparative Clinical Study was conducted on sixty eyes of sixty patients complaining of primary pterygium of variable duration. They were classified randomly into Two groups: Group (A) which received subconjunctival injection of bevacizumab 1.25 mg (0.05 mL) 2 weeks prior to surgery then was managed by pterygium excision with bare sclera technique, Group (B) which was managed by pterygium excision with bare sclera technique and Intraoperative application of Mitomycin C 0.02% for a duration of two minutes After medication administration, the ocular surface was copiously irrigated with balanced salt solution. Recurrence was considered when a fibro-vascular growth had occurred in the position of the previously excised pterygium crossing the limbus and extending onto the cornea for any distance. **Results:** Mean follow-up time was 8.99 months in Group (A), 6.63 in Group (B) (range, 2 – 11 months), and the recurrence rate was (36.7)% (11 of 30 eyes) in Group (A), (13.33)% (4 of 30 eyes) in Group (B). **Conclusion:** We concluded that a single preoperative subconjunctival injection of bevacizumab had decreased the recurrence rate after primary pterygium excision which seems to be marginally superior to bare sclera excision alone but does not give a more desirable recurrence rate, its use is associated with very little complications and high safty profile. Intraoperative application of Mitomycin C is effective in reducing the recurrence rate of primary pterygium but its use is associated with higher rate of postoperative complications which may be Vision-Threatening.

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Keywords: Bevacizumab, Mitomycin C, Primary pterygium, recurrence rate

1. Introduction

Pterygium is a wing shaped fibrovascular tissue arising from the subconjunctival tissues. Prevalance increases geographically towards the equator and is greater in people exposed to outdoor environment (Massaoutis et al., 2006). Historically described more as a degenerative process, inflammation and fibrovascular proliferation have proven to be very important factors (Mauro and Foster, 2009). The most common complication following pterygium removal is high recurrence rate. The recurrent growth is usually severer than the primary growth (Mathew et al., 2008), with variable range from 24-67% (El-hawy and Sherif, 2009). Treatment of recurrent pterygium was considered a challenge because high recurrence rate. Although numerous surgical techniques and several adjunctive therapies available to decrease the recurrence rate of pterygium, no treatment was completely safe or completely effective (Karahan et al., 2008). The challenge continues to find an adjunctive agent with long-term safety and efficacy (Razeghinejad et al., 2010). The adjunctive medical methods like mitomycin C, the most commonly used medical adjunctive therapy for the

prevention of pterygium recurrence, is associated with special complications, including scleral necrosis, infectious scleritis, scleral perforation and endophthalmitis (Ang et al., 2007). angiogenesis plays a key role in the formation of fibrovascular tissue (Yalcin Tok et al., 2008). In recent years, angiogenesis inhibitors have gained popularity for the management of various neovascular and proliferative ocular diseases. VEGF is one of the key elements in angiogenesis. (Chaudhary et al., 2007). Avastin binds all VEGF isoforms and exerts a neutralizing effect by inhibiting the VEGF-receptor interaction. It has been suggested as a possible adjunctive therapy for pterygium excision (Wu et al., 2009).

2. Material and Methods

Prospective, Randomized, Comparative Clinical Study was conducted on sixty eyes of sixty patients complaining of primary pterygium of variable duration that were recruited from outpatient clinics of Ophthalmology Department of Fayoum University Hospital in the period between August 2014 and December 2016. They were classified randomly into Two groups:

Group (A) which received subconjunctival injection of bevacizumab 1.25 mg (0.05 mL) 2 weeks prior to surgery then was managed by pterygium excision with bare sclera technique.

Group (B) which was managed by pterygium excision with bare sclera technique and Intraoperative application of Mitomycin C 0.02% for a duration of two minutes After medication administration, the ocular surface was copiously irrigated with balanced salt solution.

Avulsion technique was used for removal as follows:

The bulbar conjunctiva at the edge of the scleral portion of pterygium is incised with westcott scissors and this portion is freed from the underlying sclera by blunt dissection. The freed portion of the pterygium is then grasped with toothed forceps and torn from the cornea and a second forceps grasps the perilimbal tissue away to give countertraction. Residual tissue is scraped from the corneal surface with beaver blade and surface is then polished with a diamond burr. This Avulsion Technique was practised by the ancient Greeks, Its contemporary proponents contend that the operation is simple and avoids accidental, deep dissection into the cornea when the apex of the pterygium is removed. (**Zolli, 1979**).

3. Results

This study was conducted on 60 primary pterygia in 60 eyes of 60 subjects, 43 cases were males (71.7%) and 17 cases were females (28.3%). Their age ranged from 25 to 60 years where 9 cases were below 30 years, 41 cases were between 30-50 years and 10 cases were above 50 years. The mean age was 42.27 years, regarding the occupation 39 cases (65.0%) were outdoor patients while 21 cases (35.0%) were indoor patients.

The pterygium recurred in 15 cases (25%) out of 60 cases of the study. The recurrence in group (A) (bevacizumab group) occurred in 11 cases out of 30 (36.7%). In group (B) (MM-C group) the recurrence occurred in 4 cases out of 30 cases of the study (13.33%) difference between the two groups was statistically significant as regards the rate of recurrence, where $P=0.037$.

The incidence of complications in all cases of the study was 21.7% (13 cases out of 60 cases), the incidence of complications was low in group A which was 10% where 3cases showed post-operative complications out of 30 cases (3 cases developed subconjunctival haemorrhage after subconjunctival injection). But the incidence was high in group B (treated with excision and MM-C) which was (33.3%) where 10 cases out of 30 cases showed complications (6 cases out of 30 cases (20%) showed persistent vascularization of the bed of the pterygium. 2 cases

out of 30 cases (6.7%) developed conjunctival granuloma. It developed 3:5 weeks post-operatively, the two cases disappeared with administration of topical steroids after 2: 4 weeks. one case (3.3%) developed dellen at the limbal area and other case (3.3%) developed scleral thinning The statistical difference between the 2 groups was significant P . value = 0.000.

4. Discussions

In the present study, we found that it is ethically and more appropriate not to use a control group however, it establishes a base line reference to the recurrence rate. This was due to the unacceptably high recurrence rate that was recorded by numerous previous studies in excision only control group.

Regarding the ages of the patients included in the present study; they ranged from 25-60 years. The higher incidence of pterygia was found to be in the age group of 30-50 years (68.3%). Also, it was noted that primary pterygia were common in males (71.7%) than females (28.3%) and the recurrence was more in males (27.9 %, where 12 cases out of 43 male cases were recurred) than females (17.6 %, where only 3 cases recurred out of 17 female cases). Regarding the occupation, our study showed that pterygia were more common in the outdoor than indoor individuals (65.0%) also, recurrence was Only in outdoor patients (38.5%), this difference was statistically significant $P =0.001$. As regard site of pterygium, all patients in this study presented with nasal pterygium which was explained by the pathogenetic role of solar light, These findings were parallel to that were found in **Bunga & Kotipalli (2016)** in which Out of 56 eyes from 50 patients examined, 54 (96.4%) presented with Nasal Pterygia & 2 (3.5%) presented with Temporal Pterygia.

In this study the pterygium recurred in 15 cases (25%) out of 60 cases of the study. The recurrence in group (A) (bevacizumab group) occurred in 11 cases out of 30 (36.7%). In group (B) (MM-C group) the recurrence occurred in 4 cases out of 30 cases of the study (13.33%) Recurrence was considered when a fibro-vascular growth had occurred in the position of the previously excised pterygium crossing the limbus and extending onto the cornea for any distance. It was comparable to that mentioned by **shenasi et al 2011** who recorded a recurrence rate of (45.5%) in the bevacizumab group after subconjunctival bevacizumab (1.25mg) /0.1 mL injected immediately after surgical excision of the pterygium. Patients were followed-up for 9 months after the operation. **Shahin et al. (2012)** studied subconjunctival bevacizumab 1.25 mg/0.05 ml after conjunctivo-limbal autograft and found the bevacizumab group had a higher recurrence rate compared to the control group (20%

versus 9.5% respectively). In addition, the recurrence in the bevacizumab group occurred earlier and more aggressively.

The recurrence rate reported in the literature for intraoperative use of MMC in primary pterygium surgery varies from 6.7% to 22.5% **Mahar & Manzar; 2013, Thakur et al; 2012**. The most common dose, according to the literature, is 0.02% for 3min in the bare sclera **Narsani et al; 2008**. Also the recurrence rate in MMC group was comparable to that mentioned by; **Panda et al. (1998)** who recorded similar recurrence rate to our rate (12%) after 7 months, where intra-operative MM-C was used in a concentration of 0.02 % for 3 minutes for 25 cases of primary pterygia, but **Lam et al. (1998)** who used 2 concentrations (0.02% & 0.04) and 2 durations (3 & 5minutes) in his study recorded 37.9% recurrence rate with intra-operative MM-C in concentration of 0.02% for 3 minutes in 29 cases of primary pterygia. Concerning the age of recurrence, our results showed that the mean age of recurrence was 31.53 years and this was agreed with previous studies that implicated young age as a risk factor for pterygium recurrence e.g. **Mastropasqua et al. (1996)**.

From our results, it was noted that the use of intra-operative topical MM-C was a very simple technique, but it was associated with a comparatively high incidence of post-operative complications (16.7%) which were not serious. This was comparable to that mentioned in many previous studies e.g. **Díaz et al., 2008, Caliskan et al. (1996), Mastropasqua et al. (1996) and Panda et al. (1998)**.

We concluded that a single preoperative subconjunctival injection of bevacizumab had decreased the recurrence rate after primary pterygium excision which seems to be marginally superior to bare sclera excision alone but does not give a more desirable recurrence rate. It decreased conjunctival congestion and photophobia after subconjunctival injection so can be considered an effective temporary treatment in the management of pterygia in those who are not candidates for operation including recurrent pterygia Without surgery, anti- VEGF alone could reduce the symptoms and vascularity, but does not cause pterygium regression with very little complications and high safty profile. On the other hand we found that intraoperative application of Mitomycin C is effective in reducing the recurrence rate of primary pterygium after surgical excision but its use is associated with considerably higher rate of postoperative complications which may be Vision-Threatening when compared to subconjunctival bevacizumab injection so it should be used judiciously.

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