COMPARISON BETWEEN PTERYGIUM EXCISION WITH CONJUNCTIVAL AUTOGRAFT WITH AUTOLOGOUS BLOOD VS. SUTURES

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ABSTRACT

BACKGROUND

Pterygium is a degenerative condition of the subconjunctival tissue, which proliferates as vascularised granulation tissue to invade the cornea, destroying the superficial layers of stroma and Bowman's membrane, the whole being covered by conjunctival epithelium.[1] It can vary from small, atrophic pterygium to large, advancing pterygium obscuring the optical center of the cornea. The natural history of the condition is variable, prolonged static periods do exist. Anti-inflammatory drugs and lubricants have an important role in minimising the patient's discomfort, but it does not cure the disease. Hence, surgical excision of the pterygium is the most widely accepted treatment for pterygium with the main aim to reduce the recurrence of the lesion.[2] Many surgical treatments have been described over the years.

The aim of the study is to compare postoperative outcome using 2 different techniques of conjunctival autograft after pterygium excision with sutures vs. without sutures using autologous blood.

MATERIALS AND METHODS

The study included 50 eyes of 50 patients with primary pterygium. They were randomly divided into two groups- In group 1, 25 eyes underwent conjunctival autograft with patient's own blood followed by bandaging for 48 hours; in group 2, 25 eyes underwent conjunctival autograft with 10-0 monofilament nylon sutures followed by patching the eye for 24 hours. Patients were followed up postoperatively on 2nd day, at 1 week, 2 weeks and 4 weeks. All surgeries were done by same surgeon. Patient comfort, operating time, graft complications, pre and post-surgery visual acuity and astigmatism were studied.
Design- Prospective and comparative study.

RESULTS

Postoperative symptoms were less in group 1 than group 2. The operative time was significantly less in group 1 (21-30 minutes) than group 2 (31-40 minutes). Complications like graft oedema, graft retraction and graft dehiscence were present in group 1, however, the difference was not statistically significant. Also, change in astigmatism was noted postoperatively along with improvement in best corrected visual acuity. The patients need to be padded after surgery for 48 hours in group 1 compared to 24 hours in group 2.

CONCLUSION

Thus, autologous blood is a useful method for graft fixation in pterygium surgery with shorter operating time and less postoperative discomfort.

KEYWORDS

Pterygium Excision, Conjunctival Autograft, Autologous Blood, Sutures.

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BACKGROUND

Pterygium is a wing-shaped conjunctival fold, which proliferates as vascularised granulation tissue due to elastotic degeneration of the subconjunctival tissue to invade the cornea, destroying the superficial layers of stroma and Bowman's membrane.

Pterygium has a worldwide distribution[1] seen most commonly in the so-called "pterygium belt", which is defined by a geographical latitude of 40° north and south of the equator. In this area, prevalence of up to 22% has been reported.[2] In countries outside of this area reported prevalence rates usually do not exceed 2% of the general population and the lesion affects mostly patients with an extensive exposure to sunlight.

Initially, surgical treatment was bare sclera technique, which when done alone was associated with high risk of recurrence (24-89%).[3,4] Subsequently, some techniques

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currently used to prevent recurrence of pterygium are beta-radiation, excimer laser, argon laser, thiotepa and anti-metabolite drugs, conjunctival autograft and amniotic membrane graft.[5-10] But, procedures such as mitomycin C, beta-radiation or excimer laser can induce serious complications such as corneal necrosis, scleral necrosis or even phthisis bulbi.[8]

Over the years, attempts were made to optimise pterygium surgery, amongst which conjunctival autograft is associated with less recurrence rate.[11-13] The conjunctival autografting can be performed in several ways including the use of sutures, fibrin glue and autologous blood.

This prospective study aims at determining the efficacy of conjunctival autograft in primary pterygium using 10-0 nylon sutures with that of cut and paste, sutureless technique of conjunctival autograft using autologous blood in terms of patient's comfort, findings in the early postoperative period, duration and cost of surgery as well as recurrence rate at the end of 3 months.

Aim- Comparison between 2 different techniques of pterygium excision with conjunctival autograft with sutures vs. sutureless using autologous blood with respect to difference in operating time, difference in postoperative patient comfort and graft-related complications.

MATERIALS AND METHODS

A prospective study was carried out on 50 eyes of 50 patients who underwent pterygium excision with conjunctival autograft from January 2013 to April 2014 in OPD Ophthalmology at a tertiary care hospital in Mumbai. Patients were assigned numbers from 1 to 50 according to their presentation in the outpatient department. The patients with odd numbers were included in auto blood group (group 1) and they underwent pterygium excision with conjunctival autograft using autologous blood. The patients with even numbers were included in suture group (group 2) and they underwent pterygium excision with conjunctival autograft using 10-0 nylon sutures.

Inclusion Criteria

Patients with primary pterygium.
Age 20 to 70 years.

Exclusion Criteria

- Subjects not giving consent for participation in the study.
- Recurrent pterygium.
- Pseudopterygium.
- Previous history of ocular trauma.
- Previous ocular surgery.
- History of any bleeding disorder.
- Patient on any anticoagulant treatment.

Method of Collection of Data- Ethics and Scientific Committee approval was obtained for the study. Written informed consent was taken from all the patients. A detailed history and clinical examination of both the eyes was done, which included visual acuity testing with Snellen's chart, BCVA, slit-lamp examination to grade the pterygium from grade 1 to 3 and note its site, IOP measurement, fundus examination and keratometry.

Surgical Procedure- All surgeries were carried out under local anaesthesia with combination of 2% lignocaine with 0.5% bupivacaine. All patients initially underwent pterygium excision.

Conjunctival autograft was harvested from ipsilateral superotemporal aspect of the eye and measured with Castroviejo caliper. The graft was dissected as thin as possible to include conjunctival epithelium and the limbal tissue excluding the tenon's capsule. In autologous blood technique, a 0.5 mm oversize graft was taken.

The patients in group 1 were subjected to conjunctival autograft with autologous blood- Few punctures were made on the bare sclera with 26 G needle to provide autologous fibrin on small perforating veins and capillaries to encourage a thin layer of blood to cover the bare sclera. The conjunctivolimbal graft was slided into the recipient bed maintaining a limbus to limbus orientation. Graft was placed on bare sclera. Care was taken to ensure that there was no residual bleeding to relift the graft and direct compression was applied until the haemostasis was achieved usually 10 minutes.

The patients in group 2 were subjected to conjunctival autografting with 10-0 nylon sutures. The conjunctivolimbal graft was slided into the recipient bed maintaining a limbus to limbus orientation. Position of the graft was secured with 10-0 nylon sutures first at the limbus.

Postoperative care for conjunctival autografting with autologous blood- Patients patch was removed after 2 days. They were started on antibiotic, steroid and lubricating eye drops. They were followed up postoperatively at 1st, 2nd, 4th weeks.

Postoperative care for conjunctival autograft with suture- Patient's patch was removed the next day. They were started on antibiotic steroid and lubricating eye drops. They were followed up postoperatively at 1st, 2nd and 4th weeks. At the end of 4 weeks, sutures were removed.

During each follow up visit, they were evaluated for the following-

- Pain.
- Foreign body sensation.
- Lacrimation.
- Redness.
- Photophobia.

The assessment of outcome variables was done using a questionnaire and the responses were graded on a scale of 0 to 3 as-

0- Absent - No symptom.

1- Mild - Patient had tolerable symptom and present occasionally.

2- Moderate - Tolerable symptom present throughout the day.

3- Severe - Intolerable symptom present throughout the day.

The operated eye was evaluated for haematoma and displacement or oedema of graft. Other complications such as graft extrusion, graft dehiscence, graft contraction, scleral thinning and granuloma formation were assessed and noted.

RESULTS

In our study, 50 eyes of 50 patients (28 males and 22 females) with primary pterygium were subjected to pterygium excision with conjunctival autograft using either 10-0 nylon sutures or autologous blood. Male preponderance was present in both groups.

Age range of the patients is from 25 to 65 years with mean age being 45 ± 11.895 years in group 1 and 42.8 ± 11.779. Due to similar age distribution in both groups, the data was comparable.

Majority of patient had chief complaint of fleshy mass (90%). 64% patients had unilateral pterygium, while rest 36% patient had bilateral pterygium.

In the study, 60% of patients had grade 2 pterygium, followed by 26% patients with grade 3 pterygium and 14% patient with grade 1 pterygium.

Duration (in minutes)	Group 1		Group 2		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
21-30	21	84.00%	0	0.00%	21	42.00%
31-40	4	16.00%	16	64.00%	20	40.00%
≥41	0	0.00%	9	36.00%	9	18.00%
Total	**25**	**100.00%**	**25**	**100.00%**	**50**	**100.00%**

Table 1. Distribution of Study Group According to Duration of Surgery

In my study, majority of patients (84%) in group 1 had operating time of 21-30 minutes. It was significantly less compared to group 2, where 64% patients required 31-40 minutes and rest 36% patients required more than 40 minutes. The mean operating time was 26.84 ± 3.275 minutes in group 1, while it was 39.00 ± 3.851 minutes in group 2. This difference was statistically significant ($p<0.05$).

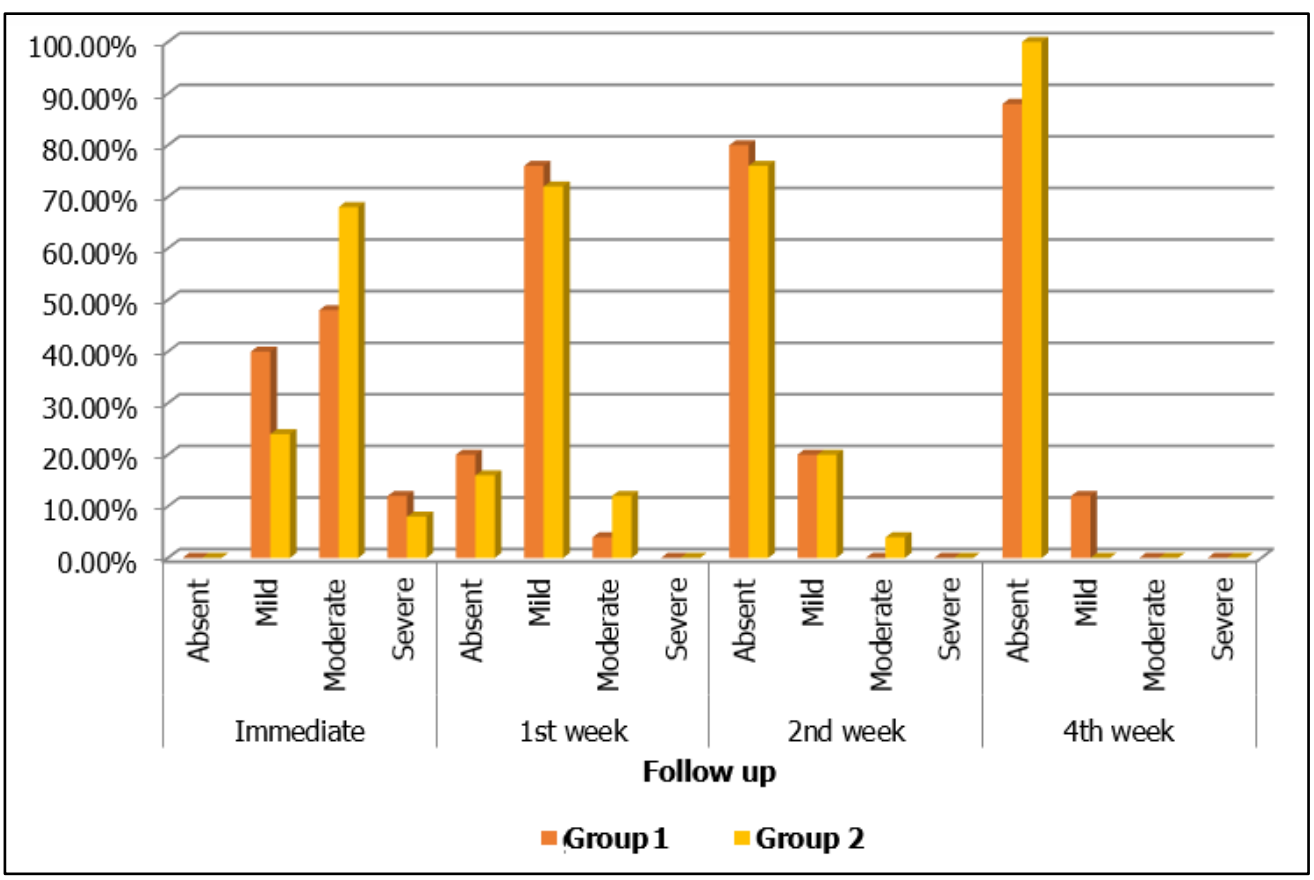

Figure 1. Distribution of Study Group According to Assessment of Redness from Day 1 to 4 Weeks

In the present study, in group 1, 40% had mild, 48% had moderate and 12% had severe redness on immediate follow up. At 1 week, it was absent in 20%, mild in 76% and moderate in 4%. At 2 and 4 weeks, it was absent in 80% and 88% patients respectively and mild in 20% and 12%, respectively. In group 2, 24% had mild, 68% had moderate and 8% had severe redness on immediate followup. At one week, it was absent in 16%, mild in 72% and moderate in 12% patients. At 2 and 4 weeks, it was absent in 76%, mild in 20% and moderate in 4%. At 4 weeks, it was absent in

100% patients. The redness reported by patients was similar in both the groups at all follow ups (p>0.05).

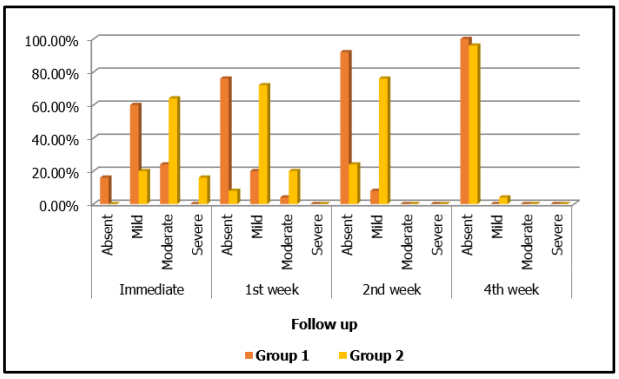

Figure 2. Distribution of Study Group According to Assessment of Watering from Day 1 to 4 Weeks

In the present study, watering was not reported by 16% patients, mild in 60% and moderate in 24% on immediate follow up and it became absent in 76%, mild in 20% and moderate in 4% on 1 week in group 1. In group 2, mild watering was present in 20%, moderate in 64% and severe in 16% patients on immediate follow up, which decreased at 1 week and was absent in 8% and persisted as mild 72% and moderate watering in 20% patients. At 2 weeks and 4 weeks, it was absent in 92% patients and 100% patients in group 1, respectively. At 2 weeks, it was absent in 24% and mild in 76% patients in group 2, while at 4 weeks, it was absent in 96% patients. This difference was statistically significant on immediate, 1 week and 2 weeks follow up (p<0.001), whereas 4 weeks, it was comparable in both the groups (p>0.05).

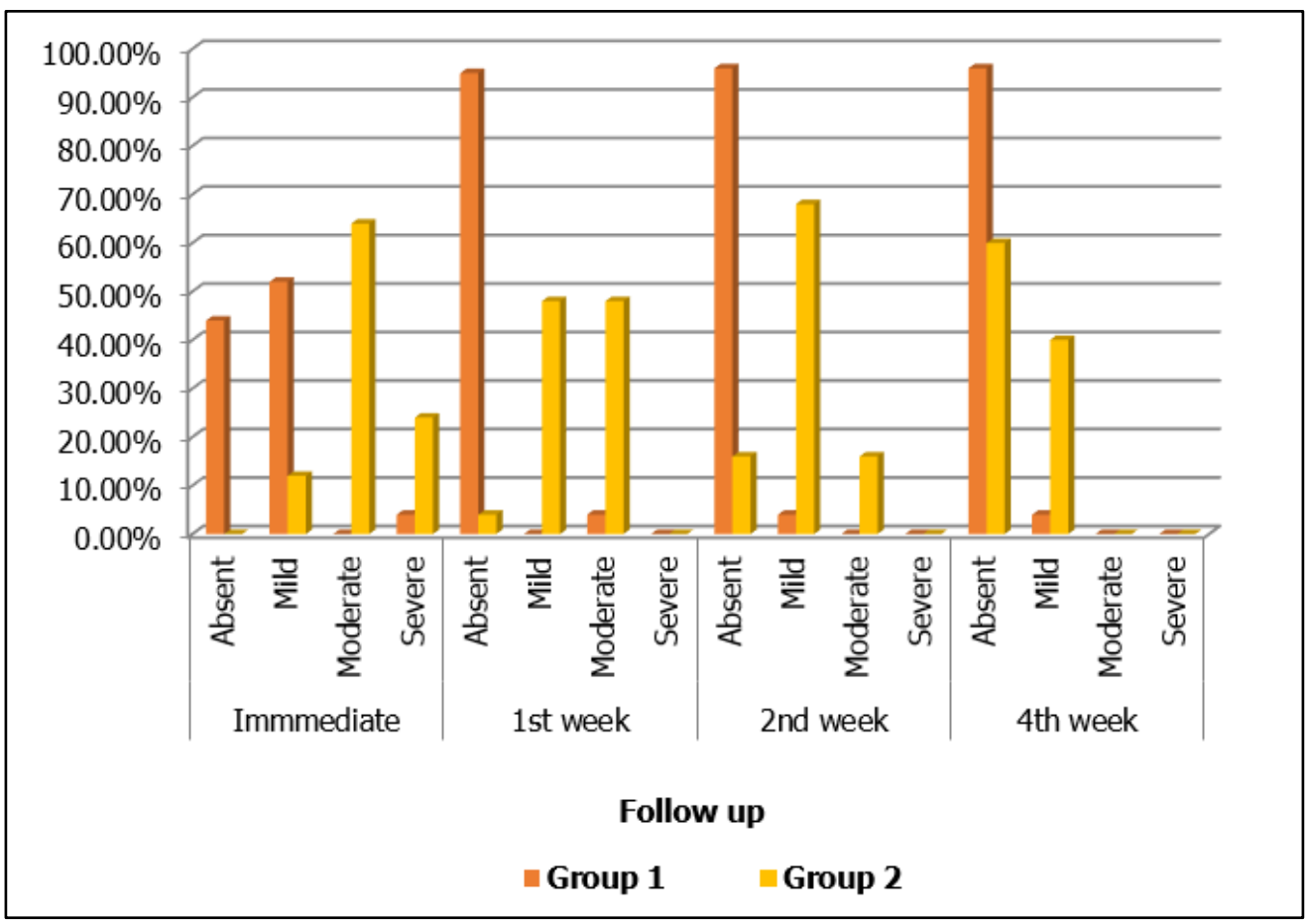

Figure 3. Distribution of Study Group According to Assessment of Foreign Body Sensation from Day 1 to 4 Weeks

In the present study, foreign body sensation was absent in 44%, mild in 52% and severe in 4% patients on immediate follow up in group 1. At 1 week, 2 weeks and 4 weeks, it was absent in 96% patients. In group 2, on immediate follow up, foreign body sensation experienced by patients was mild in 12%, moderate in 64% and severe in 24%. At 1 week, foreign body sensation was absent in 4%, mild in 48% and moderate in 48% patients. At 2 weeks was absent in 16% patients, mild in 68% and moderate in 16% patients. At 4 weeks, it was absent in 60% and mild in 40% patients. This difference was statistically significant (p≤0.02) at each follow ups.

Follow up	Observations	Group 1		Group 2		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
Immediate	Absent	18	72.00%	4	16.00%	22	44.00%
	Mild	7	28.00%	13	52.00%	20	40.00%
	Moderate	0	0.00%	8	32.00%	8	16.00%
	Severe	0	0.00%	0	0.00%	0	0.00%
	Total	**25**	**100.00%**	**25**	**100.00%**	**50**	**100.00%**
1st week	Absent	24	96.00%	14	56.00%	38	76.00%
	Mild	1	4.00%	9	36.00%	10	20.00%
	Moderate	0	0.00%	2	8.00%	2	2.00%
	Severe	0	0.00%	0	0.00%	0	0.00%
	Total	**25**	**100.00%**	**25**	**100.00%**	**50**	**100.00%**
2nd week	Absent	25	100.00%	22	88.00%	47	94.00%
	Mild	0	0.00%	3	1.00%	3	6.00%
	Moderate	0	0.00%	0	0.00%	0	0.00%
	Severe	0	0.00%	0	0.00%	0	0.00%
	Total	**25**	**100.00%**	**25**	**100.00%**	**50**	**100.00%**
4th week	Absent	25	100.00%	25	100.00%	50	100.00%
	Mild	0	0.00%	0	0.00%	0	0.00%
	Moderate	0	0.00%	0	0.00%	0	0.00%
	Severe	0	0.00%	0	0.00%	0	0.00%
	Total	**25**	**100.00%**	**25**	**100.00%**	**50**	**100.00%**

Table 2. Distribution of Study Group According to Assessment of Photophobia from Day 1 to 4 Weeks

In the present study, in group 1, photophobia was absent in 72%, mild in 28% patients on immediate follow up. At one week, it was absent in 96% patients and at 2 and 4 weeks, no patients reported photophobia. In group 2, on immediate follow up, photophobia was present as mild in 16%, moderate in 52% and severe in 32% patients. At 1 week, it was absent in 56%, mild in 36% and moderate in 8%. At 2 and 4 weeks, it was absent in 88% and 100% patients, respectively. This difference was statistically significant on immediate and 1 week follow up ($p<0.05$), whereas at 2 and 4 weeks, it was comparable in both the groups.

In my study, in group 1, on immediate follow up, graft oedema was absent in 56% of grade 1 in 24%, grade 2 in 8% and grade 3 in 12% patients. At 1 week, it was absent in 80%, grade 1 in 8% and grade 2 in 12%. At 2 and 4 weeks, it was absent in 84% and 100% patients, respectively. In group 2, on immediate follow up, graft oedema was absent in 84% and of grade 1 in 16%. At 1, 2 and 4 weeks, none of the patients had graft oedema. The difference was not statistically significant and both the groups were comparable.

In the present study, in group 1, graft retraction was absent in 72% and present in 28% patients on immediate follow up. In group 2, graft retraction was absent in 88% and present in 12% patients. At 4 weeks, none of the patients had graft retraction. This was statistically insignificant.

In the study, in group 1, graft haematoma was observed in 20% patients on immediate follow up, 12% patients at 1 week and 4% patients at 2 weeks. In group 2, graft haematoma was seen in 8% patients on immediate follow up and 4%patients at 1 week. At 2 and 4 weeks, graft haematoma was not observed in any of the patient. However, this difference was statistically not significant.

In my study, graft dehiscence was seen in one patient in group 1.

DISCUSSION

The purpose of our study was to examine 50 eyes of 50 patients with pterygium and to compare postoperative outcome using two different technique of conjunctival autograft with sutures vs. without sutures using autologous blood post pterygium excision.

The study population consisted of 56% males and 44% females. Similar pattern was seen in Blue Mountain Eye Study.[14] The age ranges from 25 to 65 years with similar distribution in both the groups. More incidences were seen in patients between 25-35 and 46-55 years of age group. The mean age was 45 ± 11.895 years in group 1 and 42.8 ± 11.779 years in group 2.

The patients presented with multiple complaints. In group 1, 92% patients had complaint of fleshy mass, 16% had diminution of vision, 8% had redness and 4% had foreign body sensation. In group 2, 88% patients had complaint of fleshy mass, 20% had diminution of vision, 4% had redness and 8% had foreign body sensation.

In the present study, 64% patients had unilateral pterygium and 36% had bilateral pterygium. The ratio of unilateral to bilateral pterygium was 1:1 in males, while that in females was 4.495:1. Thus, preponderance for unilateral pterygium was seen in females.

In my study, majority of patients (84%) in group 1 had operating time of 21-30 minutes. It was significantly less compared to group 2, where 64% patients required 31-40 minutes and rest 36% patients required more than 40 minutes. The mean operating time was 26.84 ± 3.275 minutes in group 1, while in group 2, it was 39.00 ± 3.851 minutes. This difference was statistically significant ($p<0.05$). The results were comparable to an Indian study by Javadekar[15] et al, which reported that the operation

duration was 13.96 ± 3.212 minutes in the autologous blood group, while it was 30 ± 4.641 minutes in sutured group. But, according to another study, mean operating time was 24 ± 5.64 minutes in auto blood group 28 ± 6.45 in suture group.

In the present study, in group 1, 40% had mild, 48% had moderate and 12% had severe redness on immediate follow up. At 1 week, it was absent in 20%, mild in 76% and moderate in 4%. At 2 and 4 weeks, it was absent in 80% and 88% patients respectively and mild in 20% and 12%, respectively. In group 2, 24% had mild, 68% had moderate and 8% had severe redness on immediate follow up. At 1 week, it was absent in 16%, mild in 72% and moderate in 12% patients. At 2 and 4 weeks, it was absent in 76%, mild in 20% and moderate in 4%. At 4 weeks, it was absent in 100% patients. The redness reported by patients was similar in both the groups at all follow ups ($p>0.05$).

The results were in accordance to study by Javadekar[15] et al.

These were in accordance to study by Javadekar[15] et al and Choudhury[16] et al.

In the present study, pain in group 1 was absent among 28% patients, mild in 64% and moderate in 8% on immediate follow up and it became absent in 84% during week one. In group 2, mild pain was present in 56% and moderate in 44% patients on immediate follow up, which decreased at 1 week and was absent in 28% and persisted as mild pain in 72% patients. At 2 weeks and 4 weeks, it was absent in 92% patients and 100% patients respectively in both the groups. This difference was statistically significant on immediate and 1 week follow up ($p<0.001$), whereas at 2 weeks and 4 weeks, it was comparable in both the groups ($p>0.05$).

A study by Wit D[17] et al also concluded that using autologous blood for conjunctival autograft patients has minimal pain and it tends to disappear by 1 week postoperatively.

In the present study, watering was not reported by 16% patients, mild in 60% and moderate in 24% on immediate follow up and it became absent in 76%, mild in 20% and moderate in 4% on 1 week in group 1. In group 2, mild watering was present in 20%, moderate in 64% and severe in 16% patients on immediate follow up, which decreased at 1 week and was absent in 8% and persisted as mild in 72% and moderate watering in 20% patients. At 2 weeks and 4 weeks, it was absent in 92% patients and 100% patients in group 1, respectively. At 2 weeks, it was absent only in 8% and mild in 92% patients in group 2, while at 4 weeks, it was absent in 96% patients. This difference was statistically significant on immediate, 1 week and 2 week follow up ($p<0.001$), whereas 4 weeks, it was comparable in both the groups ($p>0.05$).

The study by Javadekar[15] et al concluded that subjective symptoms of lacrimation were fewer and disappeared more rapidly in the autologous blood group than the suture group.

Other studies by Choudhury[16] et al and Elwan[18] et al also reported significant symptomatic relief in lacrimation amongst the patients in auto blood group compared to suture group.

In the present study, foreign body sensation was absent in 44%, mild in 52% and severe in 4% patients on immediate follow up in group 1. At 1 week, 2 weeks and 4 weeks, it was absent in 96% patients. In group 2, on immediate follow up, foreign body sensation experienced by patients was mild in 12%, moderate in 64% and severe in 24%. At 1 week, foreign body sensation was absent in 4%, mild in 48% and moderate in 48% patients. At 2 weeks was absent in 16% patients, mild in 68% and moderate in 16% patients. At 4 weeks, it was absent in 60% and mild in 40% patients. This difference was statistically significant ($p\leq0.02$) at each follow-ups. Similar results were seen in study by Choudhary et al.

Javadekar[15] et al and Elwan[18] et al also concluded that there occurs faster relief in foreign body sensation in autologous blood group than compared to suture group.

In the present study, in group 1, photophobia was absent in 72%, mild in 28% patients on immediate follow up. At 1 week, it was absent in 96% patients, and at 1 and 4 weeks, no patients reported photophobia. In group 2, on immediate follow up, photophobia was present as mild in 16%, moderate in 52% and severe in 32% patients. At 1 week, it was absent in 56%, mild in 36% and moderate in 8%. At 2 and 4 weeks, it was absent in 88% and 100% patients, respectively. This difference was statistically significant on immediate and 1 week follow up ($p<0.05$), whereas at 2 and 4 weeks, it was comparable in both the groups. The results were similar to studies by Javadekar[15] et al, Choudhury[16] et al and Elwan[18] et al.

In my study, in group 1, on immediate follow up, graft oedema was absent in 56% of grade 1 in 24%, grade 2 in 8% and grade 3 in 12% patients. At 1 week, it was absent in 80%, grade 1 in 8% and grade 2 in 12%. At 2 and 4 weeks, it was absent in 84% and 100% patients, respectively. In group 2, on immediate follow up, graft oedema was absent in 84% and of grade 1 in 16%. At 1, 2 and 4 weeks, none of the patients had graft oedema. The difference was not statistically significant and both the groups were comparable. Also, it was observed that graft retraction was more in patients with graft oedema and it subsided with decrease in graft oedema. The results were similar to Elwan[18] et al.

In the study, in group 1, graft haematoma was observed in 20% patients on immediate follow up, 12% patients at 1 week and 4% patients at 2 weeks. In group 2, graft haematoma was seen in 8% patients on immediate follow up and 4% patients at 1 week. At 2 and 4 weeks, graft haematoma was not observed in any of the patient. However, this difference was statistically not significant. This findings were not present in other studies. The occurrence of graft haematoma in the study might be due to improper technique. Wit D[17] et al suggested direct tamponading of small vessels with non-toothed forceps to reduce haematoma formation.

In my study, total graft dehiscence was seen in one patient (4%) in group 1. It was similar to study by Elwan[18]

et al. Graft dehiscence is a recognised complication of using fibrin glue.

Wit D.[17] et al reported no graft displacement and postulated that sutureless and glue-free graft resulted in even tension across the whole graft interface and no direct tension on the free edges resulting in reduced stimulus for subconjunctival scar formation. He also proposed that the apposition of the eyelids to the bulbar conjunctiva provides a natural biological dressing, compression and a smooth frictionless surface.

CONCLUSION

This study on 50 eyes of 50 patients showed better efficacy of autologous blood in conjunctival autografting among the patients undergoing pterygium excision.

The study population consisted of 56% males and 44% females. The age ranges from 25 to 65 years with similar distribution in both the groups. The mean age was 45 ± 11.895 years in group 1 and 42.8 ± 11.779 years in group 2.

The operating time in group 1 was significantly less compared to group 2. Patients were patched for 48 hours after conjunctival autograft with autologous blood compared to 24 hours in suture group. We found better efficacy of autologous blood in conjunctival autografting among the patients undergoing pterygium excision with faster recovery postoperatively in terms of pain, foreign body sensation, lacrimation and discomfort during blinking when compared that with sutures.

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