

A comparative study of conjunctiva limbal auto graft and amniotic membrane transplantation in management of pterygium

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I. Introduction

Pterygium is a common worldwide external eye disease especially affecting population in tropical and subtropical areas. It is a wing shaped fold of conjunctiva encroaching upon the cornea from either side within the interpalpebral fissure. Pterygium has a worldwide distribution with multiple predisposing factors such as ultraviolet radiation, tear film abnormalities, hot and dry climate and outdoor work. Recent studies suggest that it is also associated with stem cell deficiency. Limbus act as a functional zone between cornea and conjunctiva. Defect in renewal and repair of ocular surface as a result of limbal stem cell deficiency are known to cause various ocular surface disorders in which pterygium is one of the cause. Localised corneal stem cell dysfunction as a loss of limbal barrier against conjunctival invasion has been proposed as a pathogenic factor in pterygium growth and recurrence.

- Most recently new etiologies have been suggested such as p53 mutation at the chromosome 17. Surgical removal is the treatment of choice. The indication for surgery includes cosmetic blemishes, chronic irritation, recurrent inflammation, redness and reduced vision due to irregular astigmatism. Today a variety of options are available for the management of pterygium including irradiation, CLAG, AMT and application of mitomycin C. Amniotic membrane graft and conjunctival limbal autograft are safe and effective procedures in preventing recurrence rate .

AIM

- To study and compare the recurrence rate between CLAG and AMT
- To study any major complications
- To compare the surgical outcome between CLAG and AMT

II. Materials and methods

- The present study was conducted in the tertiary hospital, RIMS, Ongole from July 2017 to December 2017
- The study was conducted in 60 eyes of 60 patients of pterygium
- They were randomly divided into 2 groups, Group A and Group B
- In each group 30 cases were included
- Group A patients were surgically treated by conjunctival limbal autograft and Group B patients by Amniotic membrane graft

Patient's selection

- Patients were selected on the basis of symptomatology and clinical features such as redness, FB sensation, watering, irritation, cosmetic problem.
- Affected eyes presenting with these symptoms and signs were included in the study whose condition did not improve despite medical treatment.

Inclusion criteria

- Nasal pterygium
- Unilateral
- At least 3mm growth over the cornea

Exclusion criteria

- Temporal pterygium
- Active infection

- Less than 3mm pterygium growth over the cornea

Preoperative evaluation

- Patient data was collected which includes age,sex,occupation,any previous ocular,medical and surgical history and duration of onset of the disorder ws noted.
- Local examination of eye: recording of visual acuity in all cases
- **Lid:** lids and surrounding areas were examined for evidence of trichiasis resulting from fibrosis of lid tissue along with ectropion and entropion .
- **Conjunctiva:** examined for congestion,xerosis,scarring .
- **Limbus:** examined for superficial and deep vascularization conjunctivalization .
- **Cornea:** examined for epithelial defects,conjunctivalization,keratinization and vascularization.cornea sensation were assessed.
- **Anterior chamber :** AC depth was assessed.
- **Iris:** examined for evidence of synechiae,loss of pattern and presence of atrophic patches.
- **Pupil:** size,shape,position,reaction.
- **Lens:** opacity,subluxation and dislocation.
- **Lacrimal system:** lacrimal drainage examined by syringing.
- Intraocular pressure assessed with the help of schiotz's tonometer.

Surgical technique

- Excision of pterygium: excision of pterygium head is done bluntly from underlying cornea by simple rotation and pulling the head using a multiple tooth forceps by reverse peeling technique.resection of pterygium along with involved conjunctiva and tenon's capsule is done after freeing it from the sclera taking care not to damage the medial rectus muscle.the adjacent cornea and limbus are smoothed by scraping using a surgical knife.The length and width of excised area is measured using castroviejo calipers.adequate hemostasis is usually obtained with bipolar wet field cautery.

Preparation and placement of conjunctival limbal autograft(CLAG): preparation of donor tissue consists of limbal conjunctival graft that is harvested from superior limbus.in our study graft was taken from same eye.Appropriate measurement is done according to the size of recipient bed.After marking with cautery or ink,hydrodissection was done to separate underlying tenons from the conjunctiva.Conjunctival graft was dissected peripherally by corneoscleral scissors,3-4mm from the limbus by thin dissection technique to avoid removal of excessive tenon's and episcleral tissue.Graft was placed over the excised area with fibrin glue

Placement of amniotic membrane graft:preserved amniotic membrane graft was dipped in sterile normal saline for 15 min at room temperature prior to surgery.

- Amniotic membrane graft is placed over the surface with epithelial side up.
- The stromal side is identified by presence of vitreous like strands.
- Thrombin placed on scleral bed and fibrin placed on AMG and graft was placed on the scleral bed.
- Subconjunctival gentamycin and dexamethasone is injected.
- Pad and bandage applied.

Post-operative treatment

- post-operative treatment consists of antibiotic steroid eye drop six times a day which is gradually tapered over the next six weeks.
- Preservative free tear substitute q.i.d daily for 1 month.
- Systemic antibiotics and analgesics were given b.d for seven days.
- **Follow up:** follow up was done daily till epithelialization was complete,then weekly for 2 weeks,then monthly for 6 months.

Following signs were examined on first postop day:

- Condition of the graft
- Reduction in inflammation

On the 7th postop day:

- Corneal epithelial defect by fluorescein stain.
- Condition of the graft.
- Reduction in inflammation.

On subsequent follow up:

- In addition to the above findings patients were looked for complications like haematoma,subconjunctival hemorrhage,graft edema,graft rejection,graft retraction,granuloma and recurrence.

III. Results

AGE DISTRIBUTION

AGE GROUP	CLAG	%	AMG	%
30 – 40 yrs	7	23.33%	6	20%
41 – 50 yrs	10	33.33%	9	30%
51 – 60 yrs	8	26.66%	11	36.66%
61 – 70 yrs	5	16.66%	4	13.33%
Total	30	100	30	100

SEX DISTRIBUTION OF CASES

GROUP	MALE	%	FEMALE	%
CLAG	7	23.33%	23	76.66%
AMG	5	16.66%	25	83.33%

- Above table shows sex distribution of cases in both groups.In present study 7(23%)cases were male and 23(77%) were female in CLAG group and in AMG group 5(16.66%) were male and 25(83%) were female .

PRE-OPERATIVE OCULAR SYMPTOMS

SL.NO	Symptoms	CLAG	AMG
1	FB sensation	30 (100%)	30(100%)
2	Redness	22 (73.33%)	20 (66.66%)
3	Itching	15(50%)	20 (66.66%)
4	watering	10 (33.33%)	8 (26.66%)
5	Recurrent inflammation	10 (33.33%)	12 (40%)

- Above table depicts pre-operative ocular symptoms.In the present study most common symptoms were F.B. sensation 100%,redness 73%,itching 50%,watering and recurrent inflammation accounts for 33% in CLAG group.
- In AMG group F.B. sensation 100%,redness 67%,itching 50%,recurrent inflammation 40%,watering in 26.66%.

Post op complications in CLAG

Post-op complications	Day 1	Day 7	1month	3month	6month
1. FB sensation	30 (100%)	12(40%)	6	-	-
2. Graft edema	17(56.66%)	8 (26.66%)	-	-	-
3. s/c haemorrhage	9 (30%)	4 (13.33%)	-	-	-
4. Granuloma	-	3	-	-	-
5. Graft retraction	2 (6%)	-	-	-	-
6. Graft rejection	-	-	-	-	-

- Above table shows post-operative complications in CLAG group.early post op complications were FB sensation,graft edema,s/c hemorrhage.Graft edema and hemorrhage subsides within one month but FB sensation was persistent after six months .

Post op complications in AMG

Post-op complications	Day 1	Day 7	1month	3month	6month
1. FB sensation	30 (100%)	9 (30%)	3	-	-
2. Graft edema	8 (26.66%)	4 (13.33%)	-	-	-
3. s/c haemorrhage	7 (23.33%)	4 (13.33%)	-	-	-
4. Granuloma	-	-	-	-	-
5. Graft retraction	3 (10%)	-	-	-	-
6. Graft rejection	-	-	-	-	-

Above table shows post-operative complications in CLAG group.early post op complications were FB sensation,graft edema,s/c hemorrhage.

No. of patients	procedure	Recurrence
30	CLAG	3(10 %)
30	AMG	7(23.33%)

- Above table shows post-operative recurrence rate in both CLAG and AMG group. In present study,recurrence of pterygium occurs in 3(10%) cases of CLAG and 7(23%) in AMG group .

IV. Discussion

- This study has been carried out on 60 eyes of 60 patients of pterygium,who presented themselves in the department of ophthalmology,RIMS,ongole.30 cases of pterygium were treated with CLAG and 30 cases with amniotic membrane transplantation.
- **Age and sex distribution:**
- The present study comprised of 60 patients of which 7(23.33%) were males and 23(76.66%) were females in CLAG group and 5(16.66%) were males and 25(83.33%) were females in AMT group. The age distribution of patients varied between 30 and 70 years,with mean age .similar observations were made by Gabric N.et al(1999),D.H.Ma et al(2000) in their studies .

STUDIES	MEAN AGE
Gabric .N.et al	42.7 + 14.5 years
D.H. Ma et al	49 + 14.5 years
E.M.Espana et al	63 +13.33
Gris O et al	61+ 13.1 years
Present study	44 + 13 years

Pre-operative symptoms:

- In the study most common symptoms were F.B. sensation 100%,redness 73%,itching 50%,watering and recurrent inflammation accounts for 33% in CLAG group.
- In AMT group F.B. sensation 100%,redness 67%,itching 50%,recurrent inflammation 40%,watering in 26.66 .
- These findings were in concordance with studies conducted by Lee SH and Tseng(1997) and CT pillai and Harminder S dua(1999) who found that the patients with pterygiumhad FB sensation,redness,itching,watering.

Post operative complications

- **Graft edema:** graft edema occurred in all cases in the early post operative period due to handling of graft.however,his resolved in 1month,following instillation of topical steroids and lubricants.

Our results were consistent with the studies conducted by Murat Gular et al (1994),Mutlu et al(1997),Wong et al(2000) and AI fayed et al(2000)

➤ **Subconjunctival hemorrhage:**

S/C hemorrhage occurs due to inadvertent trauma to conjunctival vessels and inadequate hemostasis. our finding corresponding with study conducted by Murat Gular et al(1994),Mutlu et al (1997),AI Favez et al(2002) .

➤ **Tenon's granuloma:**it was seen in 3 cases of CLAG in our study. It might be due to inadvertent removal of tenon's tissue along with graft .granuloma was excised after 2wks.

This observation also reported by Murat Gular et al(1994) who found that 3 of these occurred at graft donor site and 2 of them at recipient site.

Mutlu et al(1997) in their studies reported in 5 cases .

➤ **Graft retraction:** graft retraction were seen in 2 cases in CLAG(due to small sized graft) and 3 cases of AMT(Due to drying of the graft.

similar observations were made by Srinivas et al(1998)who reported 2 cases(3.5%)of this complication which was due to cut through the sutured with retractionof conjunctiva t graft host junction.

➤ **Rate of recurrence;**after a mean follow up period of 6months,recurrence of pterygium was noted in 3 cases in CLAG and in 7 cases in AMT. The recurrence might be due to the patient younger age with faulty surgical technique which includes improper removal of pterygium tissue,excessive removal of tenons tissue along with graft,wrong method of placement of graft in CLAG group

• In AMT group it might be due to rapid shed off the graft.

V. Conclusion

• Most of the cases were between 40-50 years in CLAG and 51-60 years in AMG .

• Female preponderance were observed compared to males in both CLAG(F/M:76.66%/23.33%) and AMG(F/M:83.33%/16.66%).

• Most common preocular symptoms are FB sensation ,redness and itching in both CLAG and AMG.

• **Post operative complications in CLAG group:**

➤ FB sensation 100% on first day and 40% on 7th day

➤ Graft edema 56.66% on first post op day and 26.66% on 7th day.

➤ S/C haemorrhage 30% on first post op day and 13.33% on 7th day.

➤ Graft retraction was seen in 2 cases.

➤ Granuloma was seen on 7th postop day.

• **Post-operative comlications in AMT group:**

➤ FB sensation 100% on first postop day and 30% on 7th day

➤ Graft edema 26.66% on first postop day and 13.33% on 7th day.

➤ S/C hemorrhage 23.33% on first postop day and 13.33% on 7th day.

➤ Graft retraction was seen in 3 cases.

• **Recurrences were 3(10%)cases in CLAG group and 7(23.33%)cases in AMT group**

• Loss of limbal barrier causes pterygium growth and recurrence.To treat this disorder ,reconstruction of limbal barrier are important.surgical removal of pterygium and conjunctival autograft with limbal stem cells transplantation was done in present study.conjunctival limbal autograft ws appeared to be effective in preventing recurrence of pterygium.

• in present study we used preserved amniotic membrane as a graft to cover the conjunctival wound it provides a substrate for the migration of conjunctival epithelial cells.the advantages of AMT include superior postoperative cosmoses and absence of donor site morbidity.

• In present study,it is concluded ,although AMT preserved the superotemporal conjunctiva and easy procedure,it has high recurrence site.conjunctival limbal autografts are technically demanding and time consuming,but they are more effective in preventing recurrences when compared with amniotic membrane graft.

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