

**A DOUBLE HEADED PTERYGIUM EXCISION WITH CONJUNCTIVO-LIMBAL
AUTOGRAFT WITH DRY AMNIOTIC MEMBRANE GRAFT AS AN ADJUVANT
THERAPY - A CASE STUDY**¹Dr. Nisar Ali Khan, ²Dr. Pournima Shyamrao Sawale, ³Dr. Swetha Laxminarayana Vemula¹HOD & Professor, Shalakyatantra Department, Government Ayurved College, Nanded.²Assistant Professor, Shalakyatantra Department, Government Ayurved College, Nanded.³PG Scholar, Shalakyatantra Department, Government Ayurved College, Nanded.***Corresponding Author Dr. Swetha Laxminarayana Vemula**

PG Scholar, Shalakyatantra Department, Government Ayurved College, Nanded.

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ABSTRACT

Pterygium is a common ocular surface disorder characterized by fibrovascular growth onto the cornea. Surgical excision remains the primary treatment, but recurrence continues to be a significant challenge. Conjunctival Limbal Autograft (CLAG) and Amniotic Membrane Graft (AMG) are widely used techniques aimed at reducing recurrence. A single case study was carried out in GAC, Nanded to promote healing and reduce recurrence in case of double headed pterygium where limited amount of autologous tissue was available. Limbal conjunctival autografting involves transplantation of limbal stem cells in addition to autologous conjunctiva.^[1] Amniotic membrane transplantation offers advantages like anti-inflammatory and anti-scarring properties promoting epithelial growth and suppressing the factors that contribute to pterygium recurrence.^[2] This study shows the utility of AMG in promoting proper healing and reducing the risk of complications such as sclerocorneal thinning and incidence of post-operative corneal perforation due to improper healing. The patient underwent pterygium excision with meticulous Tenon's dissection, followed by placement of a superior CLAG(nasally) to restore the limbal barrier and AMG(over cornea and temporal bare sclera) to enhance epithelial healing. Sutures were used for graft fixation. Postoperatively, the patient demonstrated rapid epithelialization with minimal inflammation. The grafts remained well-positioned, and symptoms resolved within the first post-operative week. No recurrence or complications such as graft oedema, granuloma, or symblepharon were observed. The cosmetic outcome was excellent. This case illustrates that combining CLAG with AMG following pterygium excision can provide effective ocular surface restoration, rapid healing, and excellent cosmetic appearance with no early recurrence. This technique may be particularly beneficial for patients with large, double headed pterygium or at higher risk of recurrence or with significant tissue non-availability.

KEYWORDS: Amniotic membrane graft, Conjunctivo-limbal autograft, Double headed Pterygium Surgery, Recurrence.

INTRODUCTION

Pterygium is a common degenerative and proliferative disorder of the ocular surface, characterized by a triangular or wing-shaped fibrovascular growth of conjunctival tissue that extends onto the cornea, usually from the nasal side. It is more prevalent in individuals living in tropical and subtropical regions where ultraviolet (UV) radiation exposure is intense, earning it the description as a "disease of the dry, dusty, and sunny climates".^[3] Epidemiological studies indicate that the

prevalence of pterygium varies widely, ranging from 2% to over 20% in different populations, depending on geographic latitude, occupational exposure, and genetic predisposition.^[4]

The precise pathogenesis of pterygium remains multifactorial and incompletely understood. Chronic UV radiation exposure is believed to play a pivotal role by inducing oxidative stress, DNA damage, and apoptosis of limbal epithelial stem cells.^[5] This damage disrupts the

limbal barrier, allowing conjunctival epithelial cells to invade the corneal surface. In addition, overexpression of growth factors such as vascular endothelial growth factor (VEGF), transforming growth factor-beta (TGF- β), and fibroblast growth factor (FGF) has been implicated in promoting fibrovascular proliferation and extracellular matrix remodeling. Inflammatory mediators, matrix metalloproteinases (MMPs), and aberrant wound healing responses further contribute to the progressive nature of the disease.^[6]

Surgical excision remains the mainstay of treatment for pterygium, especially when there is visual axis involvement, significant induced astigmatism, or chronic ocular irritation. However, postoperative recurrence continues to be a major challenge, representing the most significant obstacle to long-term disease control. Reported recurrence rates vary widely depending on surgical technique, adjuvant therapy, and patient factors—ranging from as low as 5–15% with AMG, compared with 30–80% for bare sclera excision.^[7] Recurrent pterygium tends to be more aggressive, exhibiting enhanced fibrovascular proliferation, increased inflammation, and greater adhesion to underlying tissues, which complicates subsequent surgeries.

Several adjunctive therapies—including mitomycin-C, 5-fluorouracil, anti-VEGF agents, and limbal stem cell transplantation—have been explored to reduce recurrence, with varying efficacy and potential side effects.^[8] Continued research and the development of more effective preventive and therapeutic strategies remain essential to improve surgical outcomes and maintain ocular surface health.

Limbal conjunctival autografting involves transplantation of limbal Stem cells in addition to autologous conjunctiva in order to cover the defect created from the excision of pterygium. The benefit of this method is that it decreases the recurrence rate and the limbal stem cells promote healing.^[1]

The amniotic membrane is the inner layer of the placenta facing the foetus. Dry amniotic membrane grafts are used in pterygium surgery to reduce recurrence rate and promote healing. Amniotic membrane transplantation offers advantages like anti-inflammatory and anti-scarring properties promoting epithelial growth and suppressing the factors that contribute to pterygium recurrence.^[2] It is an adjuvant therapy with conjunctival autograft and sub-conjunctival inj. Dexamethasone to reduce recurrence rate.

Amniotic membrane grafts are particularly useful in cases where,

1. As an alternative to autograft in certain cases like conjunctival scarring,
2. The need to preserve superior conjunctiva for future glaucoma surgeries,

3. In case of double headed pterygium with large epithelial defects where limited amount of autologous tissue is available.

AMG effectively covers large defects and wide ocular surface. Amniotic membrane transplantation was first described by Davis, for the use as a surgical material in skin transplantation. In 1940, its use in the treatment of ocular surface conditions was described.^[9] Since 1995, it has been increasingly used to treat variety of ocular surface conditions, including persistent corneal epithelial defects, acute chemical burns and cicatrizing conditions such as ocular cicatricial pemphigoid and Steven-Johnsons syndrome.

OBJECTIVE

1. To effectively cover the large post-excisional epithelial defects and wide ocular surfaces in case of double headed pterygium where limited amount of autologous tissue is available.
2. To promote healing and reduce recurrence in case of double headed pterygium.

MATERIALS AND METHODS



CASE REPORT

A 60 year-old female patient visited to Ophthalmology OPD of Shalakyatantra Department, Government Ayurved College and Hospital Nanded, on 13/07/2025 having complaints of Redness, Foreign Body sensation and diminution of vision in B/L eye since 1 year.

Personal History

- Diet – Mixed diet
- Addiction- Tobacco chewing
- K/C/O DM recently detected
On medication Tb.Glycomet GP 1BD since 1 month
- Profession – Farmer
- H/O Sun exposure for 30-40yrs
- No H/O Ocular trauma.

On slit lamp examination (Preoperative).,

| | RE | LE |
|-------------|---|---|
| Eyelids | N | N |
| Conjunctiva | Grade 3 NPTR | Grade 4 NPTR and Grade 3 TPTR |
| Cornea |  |  |
| AC | NAD | NAD |
| Pupil | NSRL | NSRL |
| Lens | NS1+CC+PSC | NS2+CC+PSC |
| Media | HAZY | HAZY |
| OD | 0.3:1 | 0.3:1 |
| BVS | 2:3 | 2:3 |
| Macula | FR+ | FR+ |
| Periphery | Tessilated | Tessilated |
| V/A | Unaided PH | CF 5FT NI |
| IOP | Digitally Normal | Digitally Normal |

Routine Laboratory findings

BSL F-113 mg/dl

PP-172 mg/dl

HB-13.4 gm%

HIV - Negative

HbsAg – Negative

Day 1 (Preoperative)

**Figure 1.**

Left Eye

**Figure 2.****Surgical Procedure**

- By considering the pterygium grade and vision, left eye operated firstly.
- After taking signed informed consent, Successful Excision of double headed pterygium was made under LA (peribulbar) in left eye.
- Following instillation of topical proparacaine, Painting draping done.
- Lid Speculum Applied.
- Nasal Pterygium was Larger, excised first followed by temporal.
- Pterygium was excised from the cornea by using lims forcep and iris repositor.

- Corneal surface was gently scrapped with the help of scalpel and crescent blade.
- Complete separation of Pterygium body from the sclera was done, then tough fibrous triangular head of Pterygium was excised with the help of westcott scissor.
- Fibrovacular tissue separated from the conjunctiva was excised securing the medial rectus muscle with westcott scissor.
- Same procedure was performed for the temporal pterygium excision.
- After excising pterygium, Conjunctiva was repositioned to decide the size of conjunctival autograft.
- Then inj.Ligocaine with adrenaline was injected subconjunctivally and Conjunctival limbal autograft was taken from the superior bulbar conjunctiva.
- Limbus to limbus conjunctival autograft was placed on the nasal side and graft was sutured to the surrounding conjunctiva by interrupted 8-0 Vicryl suture.
- Amniotic membrane graft was placed over the cornea and bare sclera on temporal side and sutured

with surrounding conjunctiva with interrupted 8-0 Vicryl suture.

- Then bandage contact lens(BCL) was applied.
- Moxifloxacin eyedrop 2 drops stat instilled.
- Eyepatch done and Pressure bandage given.
- After 15 days, Right eye Pterygium Excision with CLAG was done.

Post-operative Treatment

1. 0.5% Moxifloxacin with ketorolac eye drop, 1 drop QID for 4 weeks
 2. CMC 1% eye drop, 1 drop QID for 4 weeks
 3. Tobramycin 0.3% with Dexamethasone eye drop, 1 drop 6times weekly in tapering dose (started after 48 hours of surgery)
 4. Lacryl pf gel for LA, HS for 2 weeks.
- Patient was recommended to avoid dusty & sunny environments and to use sunglasses.

| V/A on 1 st Postoperative Follow up on Day 3 | OD | OS |
|---|-------|--|
| Unaided | 6/36P | Cf 5-6 ft |
| Pin Hole | NI | NI (As cornea was covered with AMG) |

At the postoperative 1st follow-up conjunctival Autograft, AMG & BCL were in place, Sub-conjunctival Haemorrhage was there.



Figure 3.

| V/A on 2 nd Follow up on Day 15 | OD | OS |
|--|-------|-------|
| Unaided | 6/36P | 6/60 |
| Pin Hole | NI | 6/24P |

Well Absorbed AMG covering cornea and temporal bare sclera on DAY 15

With BCL

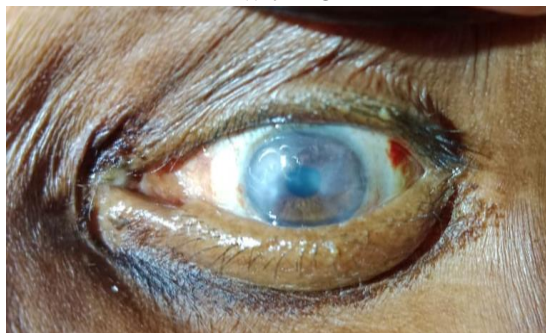


Figure 3.

After BCL removal



Figure 4.

On second followup on 31/07/25 patient was operated for Right Eye Grade 3 Nasal Pterygium excision with CLAG.

| V/A on 3 rd Follow up on Day 30 | OD | OS |
|--|-------|------|
| Unaided | 6/24P | 6/36 |
| Pin Hole | 6/18 | 6/24 |

Left Eye on Day 30



Figure 5.

Right Eye Post-op Day-15 with Left Eye Post-op Day-30

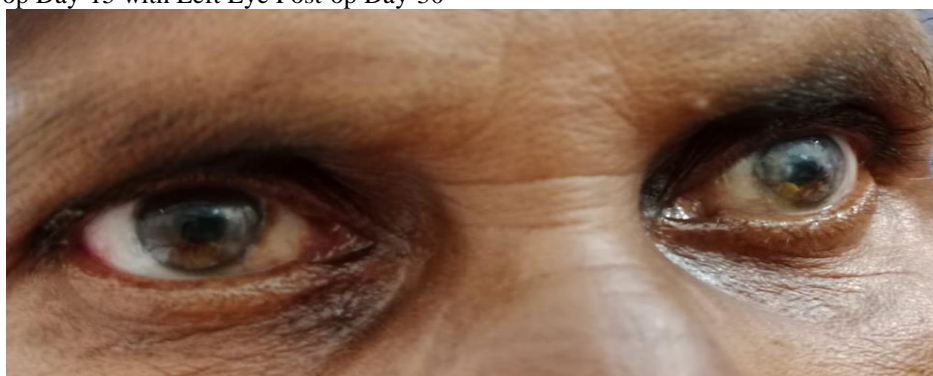


Figure 6.

| V/A on 4 th Follow up on Day 120 | OD | OS |
|---|------|------|
| Unaided | 6/24 | 6/36 |
| Pin Hole | 6/18 | 6/24 |

Right Eye Post-op Day-105 with Left Eye Post-op Day-120

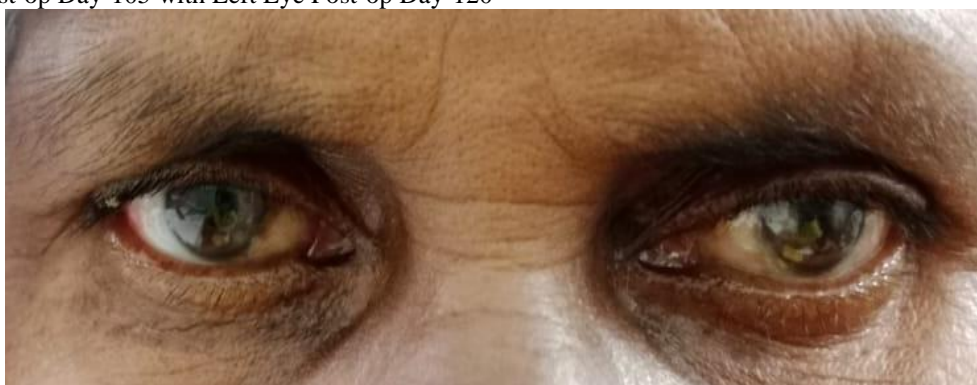


Figure 7.

DAY WISE EVALUATION

| V/A | DAY 1 | 1 st F/U- DAY-3 | 2 nd F/U- DAY-15 | 3 rd F/U-DAY-30 | 4 th F/U-DAY-120 |
|-------------|--------------|----------------------------|-----------------------------|----------------------------|-----------------------------|
| Unaided V/A | CF 5FT | CF 5-6FT | 6/60 | 6/36 | 6/24 |
| Pin Hole | Not improved | Not improved | 6/24P | 6/24 | Not improved |

RESULT

Double headed pterygium was successfully removed surgically, CLAG placed over the nasal aspect of the pterygium excision while AMG was placed temporally and over the cornea. AMG promote epithelialization while limiting scarring which allows proper corneal healing. After healing there was macular corneal opacity and the cataract which became a barrier for complete visual improvement. But the cosmetic outcome was excellent. On the follow up of 4th month patient was having no recurrence.

This study shows that combining CLAG with AMG following pterygium excision can provide effective ocular surface restoration, rapid healing, and excellent cosmetic appearance with No early recurrence.

DISCUSSION

The present findings, consistent with previous research, highlight that the use of Conjunctival Limbal Autograft (CLAG) significantly reduces the recurrence rate of pterygium compared with the traditional bare sclera or simple excision techniques. The amniotic membrane provides both a biological barrier and a substrate for epithelial regeneration, thereby restoring ocular surface integrity and reducing the risk of fibrovascular proliferation—a key factor in recurrence.

The effectiveness of AMG is attributed to several unique biological properties of the amniotic membrane. It possesses anti-inflammatory, anti-fibrotic and anti-angiogenic characteristics mediated by the expression of growth factors, cytokines and matrix components such as heavy-chain hyaluronic acid. These components inhibit transforming growth factor-beta (TGF- β) signaling, suppress fibroblast proliferation, and promote epithelialization while limiting scarring and neovascularization.^[10]

Moreover, CLAG and AMG acts as a physical barrier, preventing conjunctival tissue from invading the cornea and reducing the risk of recurrent fibrovascular growth. AMG also modulates the local immune response, minimizing postoperative inflammation, which has been shown to play a crucial role in recurrence. Compared with conjunctival autografting (CAG) alone, AMG has the added advantage of preserving healthy conjunctiva, which is particularly valuable for patients who may require future ocular surgeries such as glaucoma filtration procedures and beneficial in patients with large, double headed pterygium or at higher risk of recurrence or with significant tissue non-availability.

Several adjunctive therapies, including mitomycin-C, 5-fluorouracil, anti-VEGF agents, and limbal stem cell

transplantation have been explored to reduce recurrence, with varying efficacy and potential side effects. This study shows the combined effect of CLAG and AMG in proper ocular surface healing and reducing risk of complications such as sclerocorneal thinning and incidence of post-op corneal perforation due to improper healing with no significant side effects.

Numerous studies have reported recurrence rates as low as 5–15% with AMG, compared with 30–80% for bare sclera excision.^[7] While CLAG remains the gold standard in many centres due to its autologous origin and low recurrence rate, AMG offers a valuable alternative, especially in recurrent cases, double-headed pterygia, or where conjunctival preservation is necessary.^[11]

CONCLUSION

Conjunctival limbal autografting (CLAG) with Amniotic membrane grafting represents a safe and effective technique for reducing the recurrence of pterygium following surgical excision. AMG's unique anti-inflammatory, anti-fibrotic, and anti-angiogenic properties contributed to improve ocular surface healing and long-term stability. Compared with traditional techniques, AMG not only decreases recurrence rates but also preserves conjunctival tissue, making it particularly beneficial in patients requiring future ocular surgeries.

Future research should focus on standardizing surgical approaches, exploring synergistic effects of adjuvant therapies, and conducting long-term randomized controlled trials to further validate the efficacy of amniotic membrane transplantation in both primary and recurrent pterygium with continued advances in biomaterial science and surgical techniques.

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