

Ocular Squatter: A Case Report on Limbal Dermoid

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Abstract: ***Purpose:** To report two cases of limbal dermoid. **Method:** Two patients came with swelling in eye since childhood. Detailed examination including history, visual acuity, anterior segment examination (ASE), histopathological examination (HPE) were recorded. **Result:** Case1- A 16 year old girl gives history as above. Unaided vision is 6/36 in right eye and 6/6 in left eye. ASE of right eye showed 5mm*5mm swelling with hair follicles at the inferotemporal quadrant of limbus and 3mm*3mm swelling with hair follicles in left eye near the temporal canthus. Case2- A 55 year old female gives history as above. Unaided vision is 6/36 in right eye and 6/60 in left eye. ASE of the left eye showed 7mm*7mm swelling with hair follicles at the inferotemporal quadrant of limbus. Dermoid excision with lamellar keratoplasty was done in Case1 and dermoid excision with amniotic membrane graft transplantation was done in Case2. HPE confirmed the swellings as dermoid. **Conclusion:** Incidence of limbal dermoid is 3 in 10,000. Simple excision is advised for small lesions and large ones that obstruct visual axis, cause astigmatism and amblyopia, need higher procedures. Early treatment results in reasonable cosmetic & visual outcome.*

Keywords: limbal dermoid, lamellar keratoplasty, amniotic membrane transplantation

1. Introduction

- Dermoid cysts are true hamartomas that form when tissue gathers beneath the surface of the skin. Hair, teeth or nerves may be present in these cysts. They are commonly found on the head and neck and can also occur in ovaries, spine or other parts. Internal bleeding, infection and malignancy are some of the complications of dermoid cysts.
- Epibulbar dermoid involves the globe of the eye. More than 85% of these are found in the conjunctiva, limbus and cornea and they can appear unilaterally or bilaterally. Limbal dermoid influences vision and cause visual disturbances due to development of astigmatism and encroachment on the visual axis. ⁽¹⁾ The most common site of the limbal dermoid is the inferotemporal quadrant.
- Grading of the limbal dermoid is essential for the management of the case.

Table 1: Grading of Limbal Dermoid ⁽²⁾

Item	0	1	2	3
Corneal Involvement	None involved	≤outer 1/4 th , not involving the visual axis, superficial lesion	Outer 1/4 th -1/2, not involving the visual axis, upto corneal stroma	≥1/2, involving the visual axis, full thickness of cornea
Surface Shape	None involved	Slightly raised, cannot be observed when eye is closed	Moderately raised, observed when eye is closed	Highly raised, interferes with closing the eye
Conjunctival Involvement	None involved	≤50% of conjunctiva	>50% of conjunctiva	Conjunctiva, sclera and orbital tissue involved

Score	Grade	Management
0-3	I	conservative
4-6	II	Excision & amniotic membrane graft
7-9	III	Excision & lamellar keratoplasty

2. Material and Methods

This is a case report of two patients who came to Rajarajeswari Medical College and Hospital, Bengaluru, with limbal dermoid of different grades and their variation in the treatment approach. Detailed ocular and systemic examination were done to rule out any other abnormalities, which included history, visual acuity using Snellen's chart, anterior segment examination using slit lamp, intra-ocular pressure using non-contact tonometer, dilated funduscopy using indirect ophthalmoscope, b-scan. Blood was sent for routine laboratory investigations. Each patient is taken up for appropriate procedure by the same surgeon. The excised tissue is sent for histopathological examination.

3. Case 1

2.1 History

A 16 year old adolescent girl presented with complaints of swelling in right eye since childhood, gradually increasing in size and associated with blurring of vision. No history of pain, redness, watering, headache, or trauma. No history of any spectacle usage. No history usage of any eye drops. Not a known case of hypertension, diabetes, asthma, chronic obstructive pulmonary disease [COPD], ischemic heart disease. Patient gives history of surgery for pre-auricular tags in childhood.

2.2 Visual Acuity of the patient is as follows:

Table 2: Visual Acuity by Snellen’s chart

	Right Eye	Left Eye
Unaided Vision	6/36	6/6
Pinhole Improvement	NI	6/6
Colour Vision	Normal	Normal

2.3 Extraocular Movements: All extra ocular movements are full and normal

2.4 Anterior segment examination of the patient is as follows:

Table 3: Slit Lamp Examination

Anterior Segment Examination	Right Eye	Left Eye
LIDS	Normal	Normal
CONJUNCTIVA	Normal	3mm*3mm swelling present with hair follicles near temporal canthus
CORNEA	5mm*5mm swelling present with hair follicles at the inferotemporal quadrant of the limbus, with vascularization, involving visual axis	Clear
ANTERIOR CHAMBER	Normal depth and quiet	Normal depth and quiet
IRIS	Normal colour and pattern	Normal colour and pattern
PUPIL	3mm, round, regular and reactive	3mm, round, regular and reactive
LENS	Clear	Clear

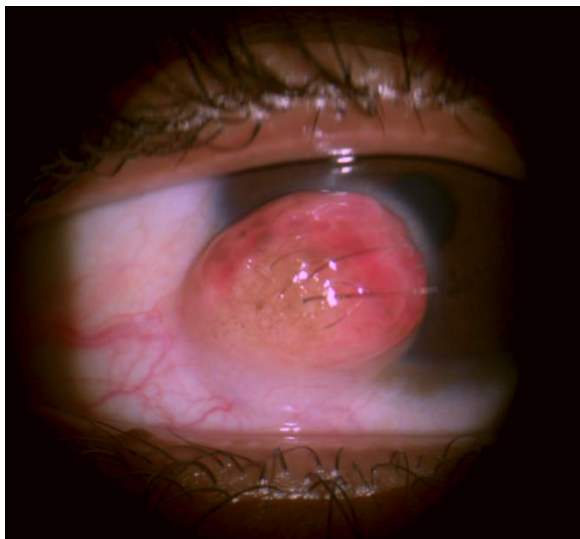


Figure 1: Right eye Limbal Dermoid

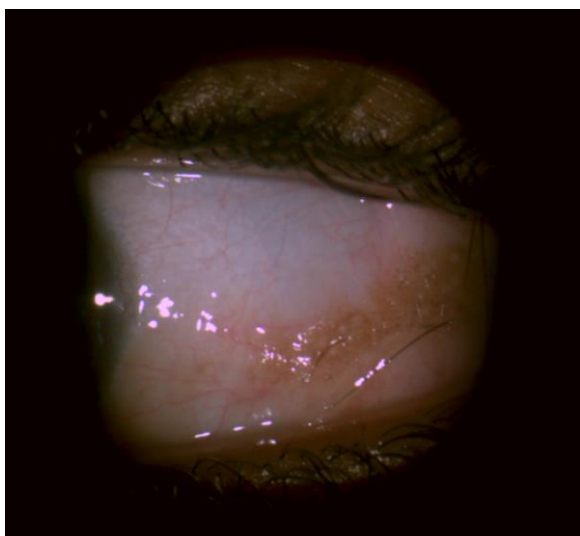


Figure 2: Left eye Dermoid

2.5 Intra Ocular Pressure [Non-Contact Tonometry]:

Right Eye: 10 mm of hg

Left Eye: 12 mm of hg

2.6 Dilated Fundoscopy

Both eyes dilated with tropicamide with phenylephrine. After full dilation of pupil (8mm):

Table 4: Dilated Fundoscopy

Fundoscopy	Right Eye	Left Eye
GLOW	Present	Present
MEDIA	Clear	Clear
DISC	Normal	Normal
CDR	0.3	0.3
VESSELS	Normal	Normal
BACKGROUND	Normal	Normal
MACULA	Normal foveal reflex	Normal foveal reflex

2.7 B-Scan

No abnormality detected

2.8 Provisional Diagnosis:

Right eye limbal dermoid

Left eye dermoid

2.9 Lacrimal syringing

Both eyes upper and lower punctums patent

2.10 Plan of Treatment

Right eye limbal dermoid was planned for excisional biopsy with lamellar keratoplasty and the excised tissue was sent for histopathological examination

All routine blood investigations, serology, ECG and chest x-ray were within normal limits.

2.11 Procedure

Under sterile aseptic precaution, Peribulbar block was given to right eye. Right eye was painted and draped. As the lesion involved cornea mainly, excision was done by keratectomy. On table, it was found that the lesion was penetrating up to the Descemet’s membrane. Hence lamellar keratoplasty was performed. The eye was patched and the excised tissue was sent for microbiological and pathological examination. The tissue was stained with hematoxylin and eosin (H&E), without any tissue processing and mounted on a slide. The stained sections were examined by a light microscope and it was confirmed to be a dermoid.

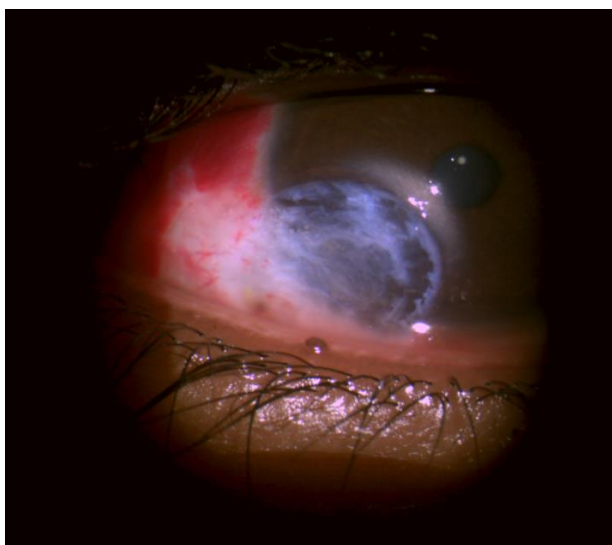


Figure 3: Intraoperative image after dermoid excision

2.12 Follow-up

Post-operative day-1 was uneventful and patient had vision of 6/6 after 6weeks. Since the dermoid in the left eye doesn’t involve the cornea nor caused any cosmetic hindrance, the patient is advised for follow-up every 3months.

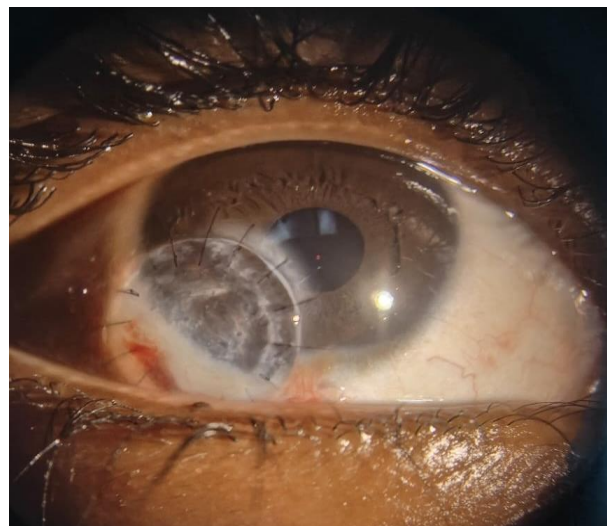


Figure 4: Post-operative image after lamellar keratoplasty

4. Case Report II

3.1 History

A 55 year old patient presented with complaints of swelling in left eye since childhood, which was gradually increasing in size. No history of pain, redness, watering, headache, or trauma. No history of any spectacle usage. No history of usage of any eye drops. Not a known case of hypertension, diabetes, asthma, chronic obstructive pulmonary disease [COPD], ischemic heart disease. Family history insignificant.

3.2 Visual Acuity of the patient is as follows:

Table 5: Visual Acuity by Snellen’s Chart

Visual Acuity	Right Eye	Left Eye
Unaided Vision	6/36	6/60
Pinhole Improvement	6/9	6/12
Colour Vision	normal	normal

3.3 Extraocular Movements: All extra ocular movements are full and normal

3.4 Anterior Segment Examination of the patient is as follows:

Table 6: Slit Lamp Examination

Anterior Segment Examination	Right Eye	Left Eye
LIDS	Normal	Normal
CONJUNCTIVA	Normal	7mm*7mm swelling present with hair follicles at the inferotemporal quadrant of the limbus involving <1/4th of cornea
CORNEA	Arcus senilis present	Arcus senilis present
ANTERIOR CHAMBER	Normal depth and quiet	Normal depth and quiet
IRIS	Normal colour and pattern	Normal colour and pattern
PUPIL	3mm, round, regular and reactive	3mm, round, regular and reactive
LENS	Cataractous	Cataractous

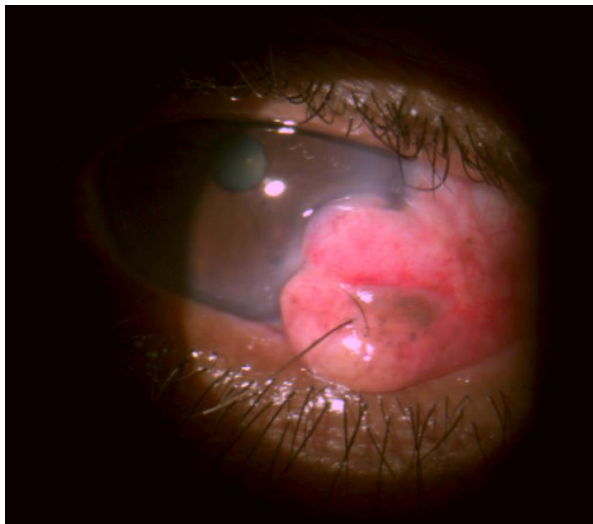


Figure 5: Left eye Limbal Dermoid

3.5 Intra Ocular Pressure [Non-Contact Tonometry]:

Right Eye: 13 mm of hg
Left Eye: 16 mm of hg

3.6 Dilated Fundoscopy

Both eyes dilated with plain tropicamide. After full dilation of pupil (8mm):

Table 7: Dilated Fundoscopy

Fundoscopy	Right Eye	Left Eye
GLOW	Present	Present
MEDIA	Clear	Clear
DISC	Normal	Normal
CDR	0.3	0.3
VESSELS	Normal	Normal
BACKGROUND	Normal	Normal
MACULA	Normal foveal reflex	Normal foveal reflex

3.7 B-Scan

No abnormality detected

3.8 Provisional Diagnosis

Left eye limbal dermoid

3.9 Lacrimal syringing

Both eyes upper and lower punctums patent

3.10 Plan of Treatment

- Left eye limbal dermoid was planned for simple excision with amniotic membrane graft transplantation and the excised tissue was sent for histopathological examination.
- All routine blood investigations, serology, ECG and chest x-ray were within normal limit.

3.11 Procedure

Under sterile aseptic precaution, Peribulbar block was given. Left eye was painted and draped. The lesion was excised by

superficial sclerokeratectomy as the majority of the lesion involved conjunctiva and sclera. The excision left a major part of bare sclera which was then covered with a single layer amniotic membrane graft and the edges of the conjunctiva sutured. The eye was patched. The excised tissue was sent to microbiological and pathological examination. The tissue was stained with hematoxylin and eosin (H&E), without any tissue processing and mounted on a slide. The stained sections were examined by a light microscope and it was confirmed to be a dermoid.

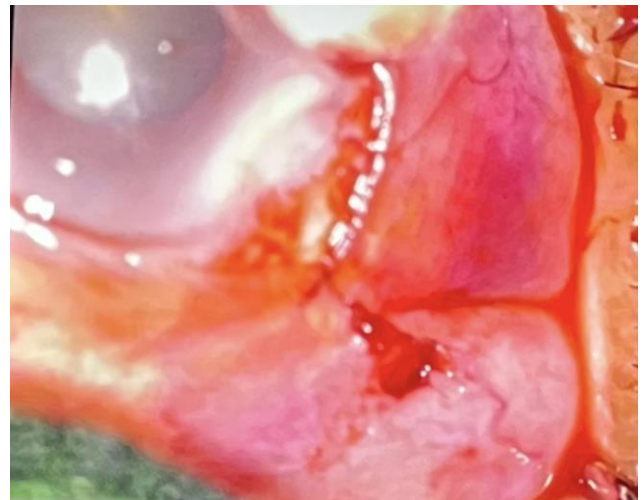


Figure 6: Intra-operative image

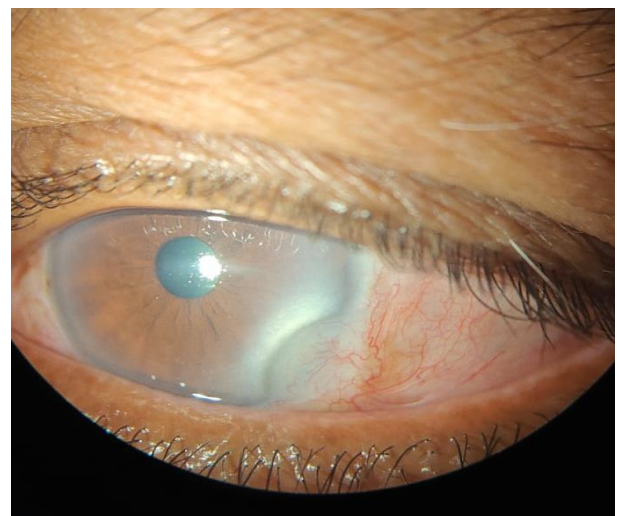


Figure 7: Post-operative image

3.12 Follow-up

Post-operative day-1 was uneventful and the patient had best corrected visual acuity of 6/9 after 6weeks.

4. Discussion

- Based on the grading system for limbal dermoid, we categorized the first case to be grade III and the second case to be grade II. In the first case, we planned for simple excision with lamellar keratoplasty, as it involved more than half of the cornea up to the corneal stroma. Complications such as corneal perforation, corneal scarring, neovascularization, pseudo-ptyerygium, and eyelid adhesion are common if the corneal defect is left

open. Full-thickness grafts lamellar may be more prone to complications such as prolonged reepithelization, interface neovascularization, steroid-induced glaucoma and graft rejection. ⁽³⁾ In the second case, simple excision with amniotic membrane transplantation was done, as it had more conjunctival and scleral involvement. Amniotic membrane graft helps in reducing the regrowth of dermoid, have anti-inflammatory and anti-angiogenic properties. ⁽⁴⁾

- Both the patients have reported good visual outcome and better quality of life after the surgery.
- Om Prakash Pant et.al 2018 in their study stated that simple excision of a limbal dermoid may lead to corneal vascularization, persistent epithelial defect, scar development, and pseudo-ptyerygium formation, as well as conjunctival symblepharon, whereas lamellar keratoplasty is an alternative for simple excision or keratectomy with a low incidence of postoperative complications, including corneal opacity, neovascularization, and pseudo-ptyerygium. Although LKP is an alternative for the surgical management of limbal dermoids, it presents some disadvantages, including graft rejection, infection, requirement for increased surgical skills, high cost, and the need for a donor cornea. ⁽⁵⁾
- Dina M Abdulmannan 2022 in their study concluded that rather than lamellar keratoplasty, excision of the dermoid from the sclera and partial keratectomy, followed by volumetric filling of the residual corneal defect with fresh multilayered amniotic membrane and pericardial patch graft on the sclera with overlying conjunctival autologous limbal stem cell transplantation may provide the best functional, refractive, and cosmetic results. ⁽¹⁾
- Anchal Tripathi et.al 2024 in their study stated that lamellar keratoplasty is an advantageous choice in the management of limbal dermoid, minimizing the post-operative complications and optimizing long term results.

5. Conclusion

Limbal dermoid is a congenital benign tumour of the limbus. It accounts for 10% of all and 29% of benign limbal tumours. The most common location for epibulbar dermoids is the temporal inferior quadrant of the limbus. Excision of the lesions is indicated for cosmetic appearance and to improve the visual acuity as the lesion may cause astigmatism. Large dermoids can also lead to surface irritation and discomfort or even central corneal opacification.

The adequate choice of surgery depends on the location, size and depth of the lesion. Anterior segment OCT maybe useful in determining the depth of the lesion.

- Grade I dermoid is characterized by having smaller lesions and patients report good compliance with spectacle correction. Small asymptomatic limbal dermoid should not be removed. Observation and regular follow up is the mainstay of treatment. Simple excision should be considered in cases of significant anisometropia, lack of compliance and amblyopia.
- Grade II dermoid needs reconstructive suture-less multilayered amniotic membrane transplantation or corneal-limbal scleral donor graft transplantation in addition to simple excision. The main reasons for using amniotic membrane transplantation on conjunctival defects are the positive effects on re-epithelialization and

inhibition of postoperative inflammation, neovascularization, and fibrosis.

- Grade III dermoid is treated by simple excision with lamellar keratoplasty or penetrating keratoplasty depending upon the depth of the corneal involvement.

It is important to choose the treatment approach which best suits the patients, considering various factors like encroachment of the visual axis, depth and extent of corneal involvement, extent of conjunctival and scleral involvement and compliance of the patient. Cosmetic appearance is also an important indication for surgical excision of the dermoid.

References

- [1] Abdulmannan D. M. (2022). Successful Management of Limbal Dermoid in Infancy and Childhood: A Case Series. *Cureus*, 14(3), e22835. <https://doi.org/10.7759/cureus.22835> Zhong J, Deng Y, Zhang P, Li S, Huang H, Wang B, Zhang H, Peng L, Yang R, Xu J, Yuan J. New Grading System for Limbal Dermoid: A Retrospective Analysis of 261 Cases Over a 10-Year Period. *Cornea*. 2018 Jan;37(1):66-71. doi: 10.1097/ICO.0000000000001429. PMID: 29211701; PMCID: PMC5728589.
- [2] Zhong, J., Deng, Y., Zhang, P., Li, S., Huang, H., Wang, B., Zhang, H., Peng, L., Yang, R., Xu, J., & Yuan, J. (2018). New Grading System for Limbal Dermoid: A Retrospective Analysis of 261 Cases Over a 10-Year Period. *Cornea*, 37(1), 66–71. <https://doi.org/10.1097/ICO.0000000000001429>
- [3] Uçakhan Gündüz, Ö. Ö., Gündüz, A. K., & Nalçı Baytaroglu, H. (2023). Lamellar Keratoplasty Using Microkeratome-Assisted Anterior Lamellar Graft in the Management of Deep Limbal Dermoid: A Case Report. *Turkish journal of ophthalmology*, 53(3), 183–185. <https://doi.org/10.4274/tjo.galenos.2023.93027> Lang SJ, Böhringer D, Reinhard T. Surgical management of corneal limbal dermoids: retrospective study of different techniques and use of Mitomycin C. *Eye (Lond)*. 2014 Jul;28(7):857-62. doi: 10.1038/eye.2014.112. Epub 2014 May 23. PMID: 24858530; PMCID: PMC4094805.
- [4] Lang, S. J., Böhringer, D., & Reinhard, T. (2014). Surgical management of corneal limbal dermoids: retrospective study of different techniques and use of Mitomycin C. *Eye (London, England)*, 28(7), 857–862. <https://doi.org/10.1038/eye.2014.112>
- [5] Pant, O. P., Hao, J. L., Zhou, D. D., Wang, F., Zhang, B. J., & Lu, C. W. (2018). Lamellar keratoplasty using femtosecond laser intrastromal lenticule for limbal dermoid: case report and literature review. *The Journal of international medical research*, 46(11), 4753–4759. <https://doi.org/10.1177/0300060518790874>
- [6] Tripathi, A., Mohan, S., & Pathak, L. (2024). Managing Limbal Dermoids in Patients with Goldenhar Syndrome: A Case Series. *Romanian journal of ophthalmology*, 68(3), 306–311. <https://doi.org/10.22336/rjo.2024.55>