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Dry Amniotic Membrane Graft -A Blessing for Reconstruction of Conjunctival Surface.

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Abstract:
Purpose: *To analyze the indications and outcome of use of dry amniotic membrane graft for reconstruction of various conjunctival disorders .*
Materials And Methods: *It is a prospective interventional study done on patients attending a tertiary health care centre with disorders of conjunctival surface who underwent restoration with dry amniotic membrane graft.This study was conducted between Aug 2015 to July 2016 with a mean follow up of 7 weeks.*
Results: *Ten eyes of nine patients were operated which included 4 cases of pterygium, 2 symblepharon with pseudopterygium,1 cojunctivalnevus, 1chemical burn, 1 ocular surface squamous neoplasia and 1malignant melanoma.One eye developed amniotic membrane retraction postoperatvely and in one eye recurrence of growth was seen.*
Conclusion: *Dry amniotic membrane graft can be effectively used for reconstruction of conjunctival surface disorders.*
Keywords: *Dry amniotic membrane, Symblepharon, Junctional nevus.*

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I. Introduction

Amniotic membrane is a 0.02 mm to 0.5 mm five layeredmembrane,composed of three basic layers.Epithelial monolayer, thick basement membrane and avascular, hypocellular stromal matrix Amniotic membrane transplantation (AMT) was first described by Davis for use as a surgical material in skin transplantation[1]. In the 1940s, its use in the treatment of ocular surface conditions was described[2]. Amniotic membrane transplantation is currently used for a continuously widening spectrum of ophthalmic indications. It is an effective method of reconstruction of ocular surface. It promotes epithelialization, it contains important growth factors including epithelial growth factor and keratocyte growth factor (both of which promote wound healing), it inhibits scarring by interfering with the TGF-β signalling cascade in corneal and conjunctival fibroblasts and it inhibits inflammation by releasing anti-inflammatory cytokines from its epithelium and stroma, such as interleukin-10 and interleukin-1 receptor antagonists[3]. Furthermore, as Amniotic membrane does not express HLA-A, B, or DR antigens therefore tissue rejection seldom occurs[2].

Amniotic membrane can be fresh or freezed dried(dry amniotic membrane).Fresh AM is more commonly used in the developing world, where preservation techniques are not easily performed[4]. Unfortunately, the use of fresh AM is less advantageous, because it must be used in a limited time and does not exploit the size of the membrane for multiple tissue transplantations, and also poses a greater risk of transmitting infection. On the other hand dry amniotic membrane is made by freeze-drying fresh AM,vacuum packed and sterilised with gamma-irradiation at 25kGy and rehydrating it before use.Its advantages over fresh amniotic membrane are that it can be stored at room temperature, no need of cold chain, assured sterility, longer shelf life and can be easily cut into different shapes.

II. Aim Of The Study

To study the various indications and outcome of use of dry amniotic membrane graft for reconstruction of various conjunctival disorders.

III. Materials & methods

It is a prospective, interventional case series of 10 eyes of 9 patients. The informed consent was taken from every patient .It was done in a tertiary care hospital of western odisha,India from August 2015 to July 2016 with a mean follow-up of approximately 7 weeks.The patients with different conjunctival disorder were evaluated on slit lamp and the size of lesion was noted approximately. In the operation theatre under local anesthesia, the lesion was excised, after which dry amniotic membrane was tailored to the size of defect and was

placed with its basement membrane down and epithelial surface up. The membrane graft was secured to the recipient's conjunctival edge to facilitate epithelial growth over the membrane. Then stitches were given with 8-0 vicryl/10-0 ethilone to secure the graft.Patients were given steroid and lubricating drops for 6 weeks in the post-operative period.

IV.Results

10 eyes of 9 patients were taken in the study with a mean age of 39.1 years and male: female ratio of 2:1.The result of our study are tabulated as follows-

Sl.no	Age(yrs)	Sex	Eye involved	Diagnosis	Follow-up (weeks)	Complications
1.	28	male	RE	Pterygium	8	none
2.	50	male	LE	Malignant melanoma	6	none
3.	12	female	RE	Junctional nevus	6	none
4.	50	female	Both Eyes	Symblepharon with pseudopterygium	12	Recurrence in LE
5.	42	male	LE	Chemical burn	4	none
6.	50	male	LE	OSSN	6	none
7.	35	female	RE	Pterygium	4	Graft retraction
8.	40	male	RE	Pterygium	12	none
9.	45	male	LE	Pterygium	8	none

Table- Patient details with diagnosis and outcome.

Various indications of dry amniotic membrane graft in our study included 4 eyes with pterygium, 2 eyes with symblepharon and pseudopterygium (Fig 1), malignant melanoma 1 eye (Fig 2), junctional nevus 1 eye (fig 3), chemical burn 1 eye and ocular surface squamous neoplasia (OSSN) 1 eye (fig 4). In the post-operative period the parameters assessed were graft position, graft clarity, cosmesis achieved and any recurrence. In one eye of symblepharon we got recurrence at 12 weeks post-operative and in one case with pterygium graft retraction was seen on the day following surgery. In rest of the eyes satisfactory healing and cosmesis was achieved.

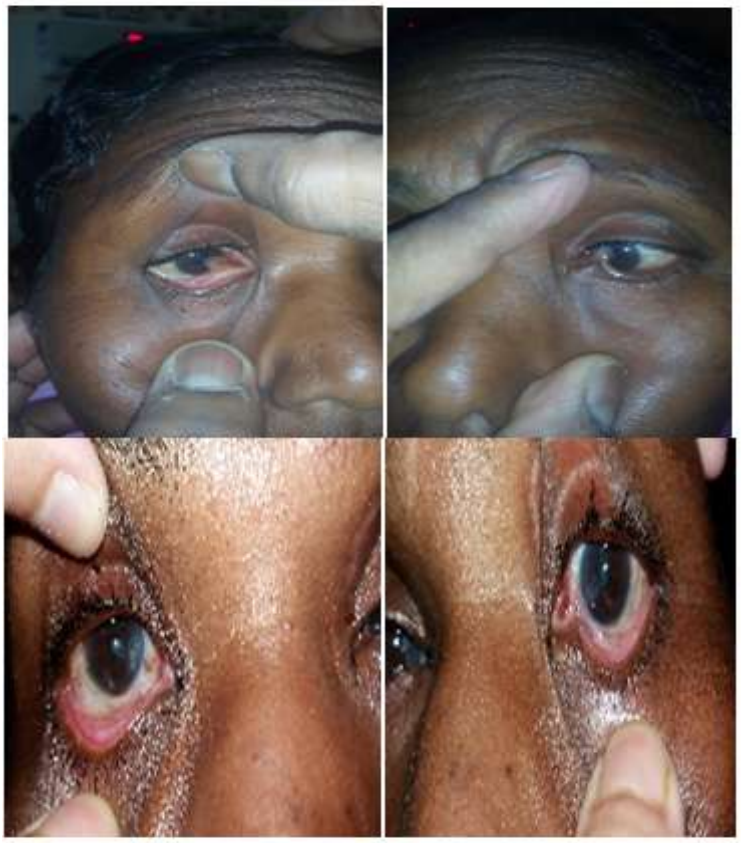

Figure 1-Symblepharon with pseudopterygium both eyes (pre-operative and post-operative at 12 weeks). Recurrence in left eye

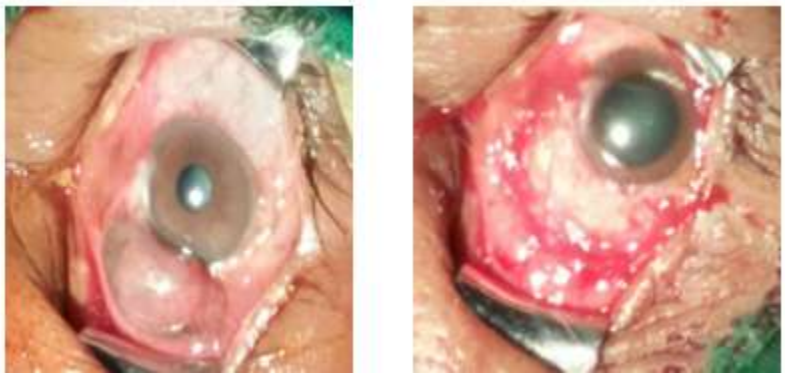

Figure 2-Malignant melanoma conjunctiva (pre-operative and post-operative)

Figure 3- Junctional nevus right eye (pre-operative and post-operative)

Figure 4- OSSN left eye (pre-operative and post-operative)

V. Discussion

Pterygium excision with a conjunctival autograft is popular worldwide because it is safe and effective in preventing recurrence. The benefits of amniotic membrane transplantation in pterygium surgery were first reported by Prabhasawat *et al*[5].They reported a recurrence rate of 10.9% for primary pterygium following excision with amniotic membrane transplantation in a prospective study. They concluded that amniotic membrane could serve as a useful alternative to conjunctival grafts when there exists a very large conjunctival defect to cover in primary double headed pterygium, in previous multiple failed surgeries or in the context of preserving superior bulbar conjunctiva for future glaucoma surgeries.In our study using dry amniotic membrane as graft, none of our pterygium case was recurred following a follow up period of 8 weeks. Soloman *et al*[6] found that the rates of recurrence following pterygium surgery were improved when an intraoperative depot corticosteroid injection was used to control postoperative inflammation following amniotic membrane transplantation, with recurrence rates of 3.0%–9.5%.None of our patients with pterygium showed recurrence though we used postoperative topical steroids instead of intraoperative depot corticosteroid.The use of fibrin glue instead of sutures to attach the graft has also been shown to reduce the recurrence rate in amniotic

membrane transplantation, with recurrence rates of 9.4% in the fibrin glue group and 10.5% in the vicryl suture group.We secured the dry amniotic graft either with 8-0 vicryl or 10-0 ethilone.Asoklis et al[7] described amniotic membrane transplantation as an effective method of reconstruction following a conjunctival and limbal tumor excision and cryotherapy of surgical wound margins. In most cases, complete healing of an ocular surface was achieved without any clinically significant complications.Graft retraction in one of our case resulted as the patients rubbed the eye.Nakamura *et al*[8] found no significant difference between the tensile strength of sterilised dry amniotic membrane and cryopreserved one.Meller *et al*[9]found amniotic membrane transplantation effective in acute stages of chemical burn which is consistent with our results in acute chemical injury.

VI. Conclusion

Dry amniotic membrane is durable, easily available and provides good cosmetic results in various conjunctival surface disorders.This study is one of the pioneer attempts in this part of India to analyze the indications and outcome of use of dry amniotic membrane in reconstruction of conjunctival surface.

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