



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(9): 76-78
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www.thepharmajournal.com
Received: 23-06-2022
Accepted: 26-07-2022

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Canine amniotic membrane grafting for ocular surface reconstruction after dermoid excision in a SHIH TZU puppy

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Abstract

A four month old female Shih Tzu puppy was presented with an abnormal tissue growth inside the left eye, noticed for two months. General clinical examination and detailed ophthalmic examination did not reveal any visual deficit or anatomical abnormalities other than the aberrant cutaneous tissue growth in left eye, ensuing profuse lacrimation. The condition was diagnosed as corneo-conjunctival dermoid. Under general anaesthesia, surgical excision of the dermoid tissue was performed using a corneal crescent knife, which resulted in a corneal defect involving the stromal layer. Fresh canine amniotic membrane was used in inlay pattern to support the healing process. Complete corneal epithelialization and graft absorption was noticed by 15th post-operative day. There were no scar formations or corneal opacity noticed at the site of primary lesion.

Keywords: Dermoid, canine, amniotic membrane, ocular surface

Introduction

Ocular dermoids are congenital defects characterized by the aberrant presence of cutaneous tissue in the eye and are noticed as either unilateral or bilateral affection in veterinary practice. Among canine patients, ocular dermoids are usually presented with chronic epiphora, conjunctivitis and tissue growth with clusters of hair at the peripheral cornea or limbal region (Balland *et al.*, 2015) [1]. These clusters of hair might irritate the ocular surface, resulting in blepharospasm, conjunctivitis and lacrimation; left unattended would further lead to pigmentary keratitis (Kalpravidh *et al.*, 2009) [4]. Therapeutic option for corneo-conjunctival dermoids is surgical excision involving superficial keratectomy (Martin *et al.*, 2005) [6].

Amniotic membrane is reported to have a wide range of application in the field of veterinary ophthalmology (Costa *et al.*, 2019) [3]. It can be either used as a self-sacrificing biological bandage or as a scaffold for the treatment of stromal ulcers, keratomalacia, epithelial cysts, dermoids, ocular surface neoplasms, chemical burns and in glaucoma filtration surgeries. Depending on the purpose, the graft placement varies as overlay, inlay or a layered or fill-in technique (Rahman *et al.*, 2009) [7]. In the present study, a case of corneal dermoid excision followed by successful healing with fresh canine amniotic membrane is discussed.

Materials and Methods

A four month old female Shih Tzu puppy was presented to the small animal ophthalmology out-patient unit of Madras Veterinary College with the complaint of hair growth inside left eye, noticed for past two months. On general clinical examination, physiological parameters were within the normal reference ranges. Detailed ophthalmic examination revealed the presence of a lump of dermal tissue growth with a tuft of hair in the lateral limbal region of left eye (Fig. 1). The abnormal growth was extended to the conjunctival and corneal surfaces and resulted in profuse lacrimation. Hair growth towards the axial cornea had a tendency to irritate the refractive surface, and subsequent development of pigmentary keratitis. Therefore, surgical excision of dermoid tissue was planned for.

Prophylactic antibiotic therapy was followed with Inj. Ceftriaxone at 20 mg/kg intravenously, 30 minutes prior to surgery. The patient was premedicated with Inj. Butorphanol at 0.2 mg/kg and Inj. Diazepam at 0.2 mg/kg intravenously. General anaesthesia was induced with Inj. Propofol at 3 mg/kg intravenously, to effect and maintained under 2.5% Isoflurane in 100% oxygen.

The patient was positioned in right lateral recumbency and the left eye was prepared for aseptic surgery using 5.0% w/V Povidone Iodine eye drops.

The eyelids were retracted using a wire speculum. The dermoid tissue was resected from the ocular surface using a corneal crescent blade, taking care not to leave even a small part of aberrant tissue. Fluorescein dye test was performed after the excision of dermoid tissue and it revealed a diffuse staining pattern at the site of primary lesion (Fig. 2). Presence of a large defect involving the limbal region raised a question regarding proficiency of the natural healing process in this case. For supporting the wound healing process, an amniotic membrane inlay graft was planned for.

Canine amniotic membrane collected from healthy donors after caesarean section, processed (Libera *et al.*, 2008) [5] and preserved at 4 °C in 98% Glycerol (Barros *et al.*, 1998) [2] was used in the present study. Amniotic membrane was applied over the ocular surface defect in an inlay pattern, where the epithelial surface of the membrane was in contact with the wound bed, so as to promote keratocyte repopulation and corneal stromal rebuilding. The membrane was sutured to the corneal margin in simple interrupted pattern using Polyamide 10-0 sutures (Fig 3).

Post operatively, the patient was maintained under topical antibiotic eyedrops (Gatifloxacin @ 1 drop TID), oral antibiotic (Cefpodoxime Proxetil @ 10 mg/kg SID) and anti-inflammatory (Wysolone @ 0.5 mg/kg SID) therapy. Post-operative follow up examinations were performed on days 3, 7 and 15.

Results

Post-operative evaluation on third day revealed reduction in epiphora and complete absence of blepharospasm. Graft was intact and it did not cause any adverse reactions on the corneal surface. Gradual improvement in corneal healing and transparency was noticed in the subsequent days (Fig. 4). Epithelial healing and complete graft absorption was noticed by day 15 (Fig. 5). Slit lamp biomicroscopic examination revealed a transparent and smooth refractive surface (Fig. 6). Melanocytic pigmentation, which develops as a sequel to corneal healing, especially in case of injuries with limbal involvement did not happen in this present case.

It is concluded that canine amniotic membrane prepared under sterile conditions and preserved properly at refrigerator temperature can be used as an excellent and cost effective graft material for ocular surface reconstruction. Amniotic membrane helps in reducing the lag phase of corneal healing process and thereby avoids repeated hospital visits and prolonged medication, which is difficult in companion animals in particular.



Fig 1: Corneo-conjunctival dermoid in the left eye, with a tuft of hair touching the axial cornea

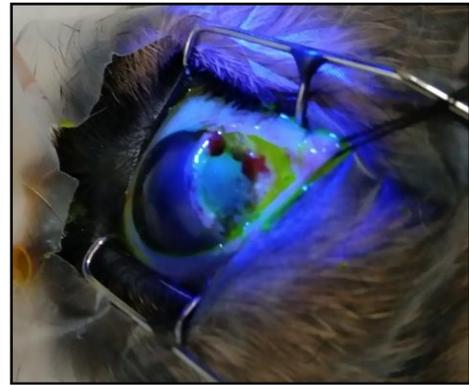


Fig 2: A diffuse fluorescein dye uptake pattern noticed after the excision of dermoid tissue



Fig 3: Canine amniotic membrane applied over the ocular surface defect



Fig 4: Day 7: Partial disintegration of graft and epithelialization of the defect



Fig 5: Post-operative day 15: Complete healing without corneal pigmentation



Fig 6: Slit lamp bio microscopy revealed smooth and transparent refractive surface

Acknowledgement

The authors are thankful to Department of Veterinary Surgery and Radiology, Madras Veterinary College, Chennai-600 007 for the facilities provided for this study.

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