

Bovine amniotic membrane derived extracellular matrix scaffold for treatment of descemetocoele in a Labrador Retriever dog

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Corneal ulcer refers to any keratopathy where there is a loss of the epithelial layer. In case of a rapidly advancing ulcer, stromal loss can occur, leading to the exposure of Descemet's membrane, a condition known as descemetocoele (Maggs, 2008). Prompt surgical intervention is crucial to facilitate quicker healing; if left untreated, the membrane may rupture, causing the escape of aqueous humour and protrusion of the iris through the corneal wound.

A 5-month-old Labrador Retriever dog was presented with a history of ocular discharge, blepharospasm and scleral congestion in the right eye. Visual function tests were all positive. Ophthalmoscopic examination revealed deep corneal injury on the inferior cornea of the right eye (Fig. 1). Fluorescein dye test revealed a halo of dye staining at the defect, with the absence of dye staining at the centre. The condition was diagnosed as descemetocoele and planned for grafting with bovine amniotic membrane (BAM) derived extracellular matrix scaffold (ECM).

The animal was premedicated with butorphanol (0.2 mg/kg body wt.) followed by midazolam (0.2 mg/

kg body wt.) administered intravenously. Anaesthetic induction was done with ketamine (2mg/kg body wt.) followed by propofol (2 mg/kg body wt.). Anaesthesia was maintained with 1.5-2% isoflurane in 100 % oxygen. The animal was positioned in left lateral recumbency with the affected eye facing upwards. The eyeball was fixed centrally with stay sutures. The ulcer and its margins were debrided to remove dead tissues. Bovine amniotic membrane (BAM) collected during caesarean section, decellularized as per Ballesteros *et al.* (2020) and preserved at -20° C in phosphate buffered saline after washing in normal saline, was used as the ECM scaffold to treat the defect. The preserved BAM derived ECM scaffold was grafted by suturing it to the edges of the corneal defect using 8-0 vicryl (Fig. 2). The grafted cornea was then protected with a third eyelid flap for 10 days.

Postoperatively, the animal received topical antibiotic and hypertonic saline eye drops along with oral riboflavin tablets for 10 days. Third eyelid flap was removed on 11th day at the local veterinary hospital, from where it was reported. Review on the 20th day (Fig. 3) revealed positive visual function tests.



Fig. 1: Defect on the inferior cornea.



Fig. 2: BAM derived ECM scaffold as onlay graft.

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Fig. 3: 20th postoperative day shows almost complete healing

Mild haziness and vascularisation were observed at the healed area. Fluorescein dye test was negative. Review on the 30th day (Fig. 4) revealed marked reduction in haziness and improvement in transparency at the grafted area. The animal was not reported for further reviews, but telephonic enquiries reported complete recovery.

Litwiniuk and Grzela (2014) in their review about amniotic membrane reported that corneal ulcers and other ocular disorders such as perforation, chemical or thermal burns, keratomalacia etc. can be treated by amniotic membrane. The authors also stated that amniotic membrane was popular because of its biocompatibility, anti-proteolytic, anti-angiogenic, anti-inflammatory, anti-fibrotic, anti-scarring, anti-bacterial and re-epithelializing properties.

The present report place on record the successful



Fig. 4: 30th postoperative day the cornea becomes near normal.

use of bovine amniotic membrane derived extracellular matrix scaffold as an onlay graft for treating descemetocoele in a Labrador Retriever dog.

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