

Ophthalmology Snapshot

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History

A 2 year-old male Pekingese was referred to the Ophthalmology Clinic, Small Animal Teaching Hospital, Faculty of Veterinary Science, Chulalongkorn University for ocular surgery. He initially developed right ulcerative keratitis, which had shortly progressed to corneal rupture with iris protrusion. He had been topically on tobramycin.

Ophthalmic examinations revealed large anterior staphyloma, which was 8 mm in diameter at the center of the cornea. Menace response was negative. STT 1 value was slightly high; intraocular pressure was in normal limit.

Corneal transplantation with double-layered human amniotic membrane (HAM); combination of in lay and over lay techniques, was performed. Nictitan flap was considered as a secondary support after transplantation. Topical tobramycin was replaced with fluoroquinolone. Two weeks after flap removal; ocular surface was shown in Fig 1. Menace response returned.



Figure 1 Front view of the right eye of the Pekingese at two weeks following HAM corneal transplantation.
(For better quality, figures can be viewed in the TJVM website)

Question

What was the lesion on the cornea?

Please turn to the next page for answers

Answer

Formation of granulation tissue

Comments

Corneal damage that does not extend through basement membrane heals rapidly. Transient corneal epithelial hyperplasia may shortly be involved during healing process, before normalization. Deep or large corneal ulcer (with or without infection) however undergoes dissimilar healing process. Not only they heal with epithelial sliding and replication, stromal fibroplasia and angiogenesis also occur. As a result of budding of limbal venules, progressive ingrowth of new vascular tubes takes place from limbus to stroma. The ingrowth of vessels is accompanied by migration and activation of fibroblasts.

Injured endothelium undergoes fibroblastic metaplasia with high proliferative capability. Collagenases and proteases created from damaged cells and leukocytes result in dissolution of collagen and ground substances of the cornea. Wound healing of such a significant corneal injury, as in this case, is therefore characterized by severe inflammation during acute phase, followed by an intermediate phase of profound granulation tissue formation.

Transplantation of amniotic membrane (AM) is nowadays used in many ocular disorders. In this case, the bottom layer of AM was placed as an inlaid graft to fill in corneal defect. Healing process was created as the membrane subsequently integrated into host tissue. The top layer of AM was used as a temporary biological bandage or patch (overlaid graft) to suppress host inflammation and promote tissue healing with minimal scarring.

References

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