Bovine collagen membrane offers **excellent tectonic support** in deep lamellar and penetrating keratoplasties in dogs and cats.

Use of a novel bovine collagen membrane graft in animals undergoing deep lamellar and penetrating keratoplasty: A case series

PURPOSE

- To evaluate novel bovine collagen membrane (BCM) from AJL (Spain) in various keratoplasties

METHODS

- BCM graft cases evaluated
- Vision outcome,
  Graft integration outcome
- Graft opacity severity (0-4),
  Graft opacity area (0-4)*

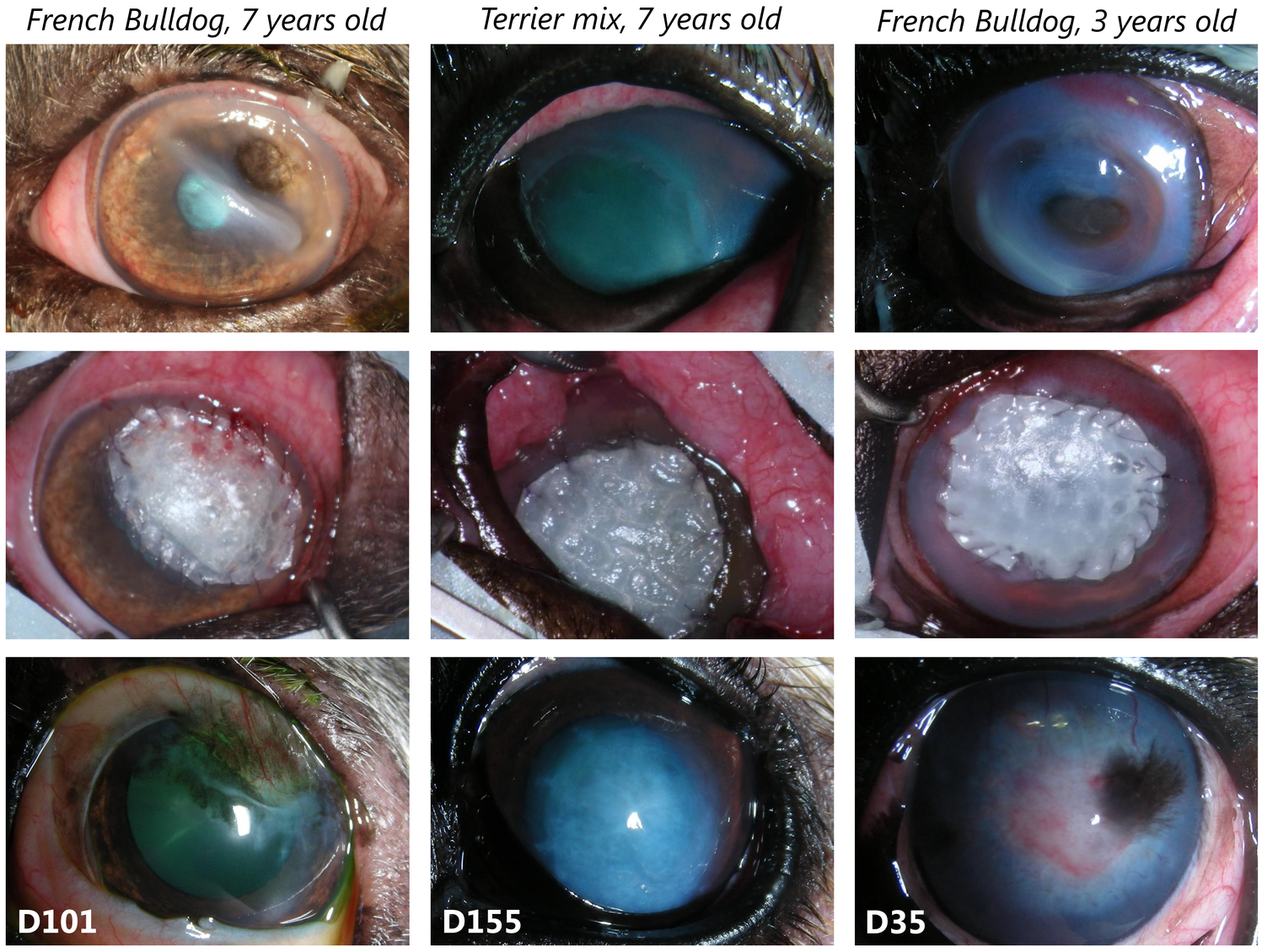
RESULTS

- 13/14 eyes remained visual
- 11/14 BMC grafts integrated
- 2/14 reperforated
- Mean follow-up 127 days
- Opacity severity median 2/4 (mean 2.5/4), opacity area median 3/4 (mean 3.5/4)

DISCUSSION

- Larger grafts integrated better than small ones

French Bulldog, 7 years old | *Terrier mix, 7 years old* | *French Bulldog, 3 years old*



	Nr	Diagnosis	Eye	Sex	Breed	Age
Dogs	1	Deep stromal ulcer, distichiasis	OS	w	French Bulldog	3.4
	2	Melting ulcer with descemetocele, KCS	OS	mk	French Bulldog	3.2
	3	Infected descemetocele, KCS	OS	w	French Bulldog	7.6
	4	Deep stromal infected ulcer, KCS	OS	wk	Terrier Mix	7.6
	5	Infected ulcer with descemetocele	OS	m	English Bulldog	2.9
	6	Deep stromal infected ulcer	OS	mk	Boston Terrier	9.6
	7	Perforated deep stromal infected ulcer, irisprolapse	OD	m	French Bulldog	0.5
	8	Deep stromal infected ulcer with descemetocele	OD	m	French Bulldog	0.5
	8	Reperforation after playing, 10 days post Sx				0.5
	9	Melting ulcer with descemetocele, KCS	OD	wk	Yorkshire Terrier	11.1
	10	2 Infected descemetocele, Distichiasis	OS	w	French Bulldog	4.7
	11	Perforated deep stromal infected ulcer, KCS	OD	mk	Chihuahua	7.3
	12	Perforated deep stromal ulcer, lipid keratopathy	OS	wk	Dachshund Mix	14.7
Cats	13	Large and deep corneal sequestrum	OS	wk	Scottish fold	10.8
	14	Large corneal perforation, irisprolapse	OS	mk	Britisch shorthair	1.0

	Nr	Surgery	Thickness	Suture material	CGO Severity	CGO Area	Last recheck
Dogs	1	Ker, BCM, TELF, PRF, Distichia-ex	200	9-0 Vicryl mono	2	2	40
	2	Ker, BCM, 360°F, Tarso, PRF	200	9-0 Vicryl mono	3	4	35
	3	Ker, BCM, 360°F, Tarso, PRF	2 x 200	8-0 Luxcryl PGla910 braid.	3	3	210
	4	Ker, BCM, 360°F, Tarso, PRF, CXL	200	9-0 Vicryl mono	3	3	257
	5	Ker, BCM, TELF PRF, nasal Entropium	200	9-0 Vicryl mono	2	4	58
	6	Ker, BCM, 360°F, Tarso, PRF	2 x 100	9-0 Luxcryl PGA braid.	2	4	213
	7	Ker, BCM, 360°F, Tarso, PRF, Iris-ex	200	9-0 Vicryl mono	4	3	127
	8	Ker, BCM, 360°F, CXL, Tarso	2 x 200	9-0 Vicryl mono			
	8	CCT with BCM as support, Tarso	200	9-0 Vicryl mono	2	3	192
	9	Ker, BCM, 360°F, Tarso, CXL	200	8-0 Luxcryl PGla910 braid.	4	4	174
	10	Ker, BCM, 360°F, Tarso	2 x 200	9-0 Vicryl mono	2	3	42
	11	Ker, BCM, Pedicle flap, Tarso	200	9-0 Vicryl mono	4	4	137
	12	CCT with BCM as support, Tarso	100	9-0 Vicryl mono	2	3	239
Cats	13	Ker, BCM, TELF	100	9-0 Vicryl mono	3	4	34
	14	Ker, BCM and BioSIS, Iris-ex	100	9-0 Vicryl mono	1	2	39

Ker = keratectomy, TELF = third eyelid flap, PRF = platelet-rich fibrin, Tarso = temporary tarsorrhaphy
CXL = corneal crosslinking, 360°F = 360° temporary conjunctival flap, CCT = corneoconjunctival transposition

	Nr	Medications in immediate postoperative phase	Integrated?	Visual	Bacteriology results
Dogs	1	meloxicam, enrofloxacin, ofloxacin, atropine	Yes	Yes	**N. A.**
	2	carprofen, enrofloxacin, moxifloxacin, atropine	Yes	Yes	negative
	3	carprofen, enrofloxacin, moxifloxacin, atropine	Yes	Yes	negative
	4	carprofen, enrofloxacin, moxifloxacin, atropine	Yes	Yes	*Enterocci* (resistent)
	5	carprofen, amoxi-clav, moxifloxacin, atropine, chloramph.	No	Yes	*S. pseudintermedius, Strep. spp.*
	6	carprofen, enrofloxacin, moxifloxacin, atropin, gentamicin	Yes	Yes	*S. pseudintermedius* (MRSP)
	7	carprofen, amoxi-clav, moxifloxacin, atropine	Yes	Yes	*Enterobacter spp.* (resistent)
	8	carprofen, amoxi-clav, moxifloxacin, atropine	Reperf.	Yes	negative
	8	carprofen, amoxi-clav, moxifloxacin, atropine	Yes (CCT)	Yes	**N. A.**
	9	carprofen, amoxi-clav, moxifloxacin, atropine	Reperf.	No	*P. aeruginosa* (resistent)
	10	carprofen, moxifloxacin, atropine	No	Yes	*S. pseudintermedius*
	11	carprofen, enrofloxacin, moxifloxacin, atropine, vetrix	Yes	Yes	negative
	12	carprofen, enrofloxacin, moxifloxacin, atropine	Yes (CCT)	Yes	negative
Cats	13	robenacoxib, moxifloxacin, atropine	Yes	Yes	**N. A.**
	14	robenacoxib, moxifloxacin, atropine	Yes	Yes	*S. felis*

red = systemic, black = topical

* TABLE 1 Scoring System extrapolated and adapted from SPOT System for anterior segment

Observation	Score	Description
Corneal graft opacity (severity)	0	Normal cornea. Appears with the slit lamp as having a bright gray line on the epithelial surface and a bright gray line on the endothelial surface with a marble-like gray appearance of the stroma.
	1	Minimal loss of corneal transparency. With diffuse illumination, the underlying anterior segment structures are clearly visible, although corneal opacity is apparent to an experienced observer.
	2	Mild loss of corneal transparency. With diffuse illumination, the underlying anterior segment structures are visible, although there is a reduction in the ability to appreciate their detail.
	3	Moderate loss of corneal transparency. With diffuse illumination, there is a greater inability to see the details of the underlying anterior segment structures than with a score of 2, but the observer is still able to score aqueous flare, iris vessel congestion, observe for pupillary response, and note lenticular changes.
	4	Severe loss of corneal transparency. With diffuse illumination, the underlying anterior segment structures cannot be seen so that the evaluation of aqueous flare, iris vessel congestion, pupillary response, and lenticular changes is not possible.
Corneal graft opacity (area)	0	Normal cornea with no area of corneal graft opacity.
	1	1%-25% area of corneal graft opacity.
	2	26%-50% area of corneal graft opacity.
	3	51%-75% area of corneal graft opacity.
	4	76%-100% area of corneal graft opacity.

Scoring system source: *Lavaud, Kowalska, Voelter et. al (2021): Penetrating Keratoplasty in Dogs using Acellular Porcine Corneal Stroma (BioCorneaVet™): A prospective pilot study of five cases, Vet Ophthalmol, 24: 543-553.*

BCM membrane

Examples of dehiscence of BCM graft

English Bulldog, 2 years old | *French Bulldog, 4 years old*

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