

Application of Atelocollagen Solution for Lacrimal Duct Occlusion

Jun Onodera¹, Akihiko Saito², Joseph George¹, Toru Iwasaki¹, Hiroshi Ito¹, Yu Aso¹,
Takashi Hamano³, Atushi Kanai⁴, Teruo Miyata¹, Yutaka Nagai¹

¹*Koken Bioscience Institute, 2-2-6 Okubo, Shinjuku-ku, Tokyo 169-0072, Japan*

²*Triangle Animal Hospital, 2-23-12 Kasuga, Bunkyo-ku, Tokyo 112-0003, Japan*

³*Department of Ophthalmology, Osaka University Medical School, 2-2 Yamadaoka, Suita, Osaka 565-0871, Japan*

⁴*Department of Ophthalmology, Juntendo University Medical School, 3-1-3 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan*

Objectives: Occlusion of the lacrimal duct improves the symptoms of dry eye. Currently, temporary occlusion of the duct is carried out through the insertion of a collagen-rod, silicone, or plastic plug. However, these devices often cause an unpleasant foreign-body sensation as well as corneal epithelial injury and accidental dropout. In order to overcome these problems, atelocollagen solution, which form soft fibrils at body temperature and neutral pH, was studied as a means of occlusion of the lacrimal duct using dogs as animal model. **Methods:** Atelocollagen solution (3%) in 0.1M phosphate buffer was prepared from calf skin. A total of 12 eyes (6 beagle dogs) were used to study the effect of atelocollagen solution for lacrimal duct occlusion. The third eyelids of the test animals were removed to reduce the basal lacrimal secretion. Atelocollagen solution was injected into the lacrimal duct using a cannula. Schirmer tear test, phenol red thread tear test (PRT) and tear turnover rate was carried out to study the level of basal tear secretion and also to evaluate the efficacy of lacrimal duct occlusion. **Results:** The removal of the third eyelids demonstrated significant decrease in the values of Schirmer tear test, PRT and tear turnover rate. Injection of atelocollagen into the lacrimal duct demonstrated significant increase in the PRT value and decrease of tear turnover rate, which indicated occlusion of the lacrimal duct. **Conclusion:** Since atelocollagen solution can be injected into the lacrimal duct of individual patients regardless of its size to form soft fibrils, this novel method may provide an excellent way for the treatment of dry-eye without body sensation.

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