



NTP Nonneoplastic Lesion Atlas

Eye, Cornea – Neovascularization

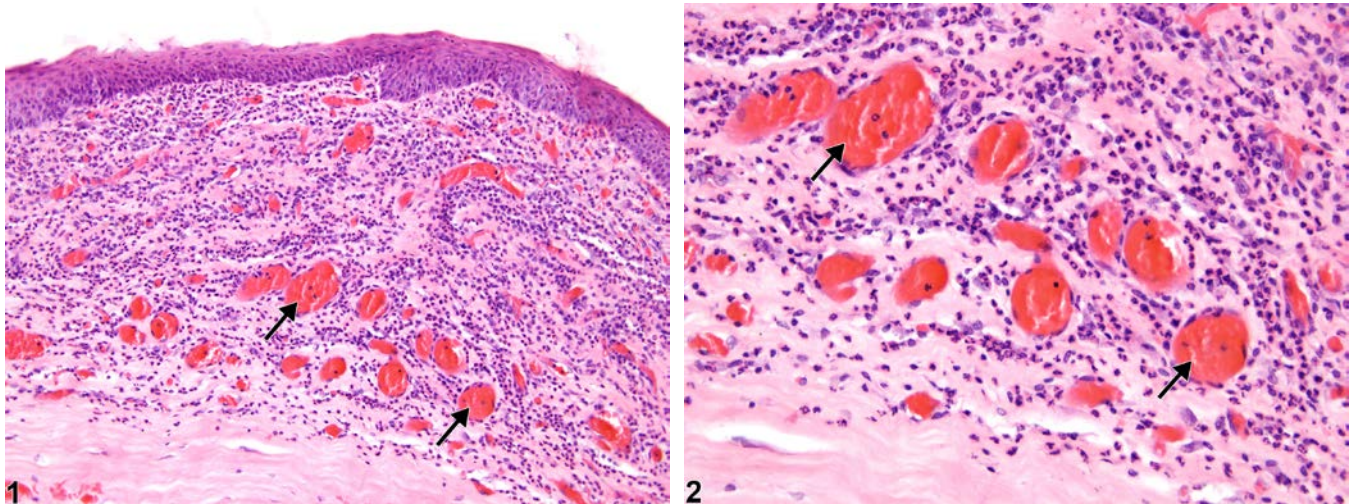


Figure Legend: **Figure 1** Eye, Cornea - Neovascularization in a male F344/N rat from a chronic study. There are multiple small blood vessels in the stroma (arrows) with concurrent inflammation and epithelial hyperplasia. **Figure 2** Eye, Cornea - Neovascularization in a male F344/N rat from a chronic study (higher magnification of Figure 1). Multiple small blood vessels are proliferating in the stroma (arrows); there is concurrent stromal inflammation.

Comment: The corneal stroma is normally avascular, but damage from various causes may result in neovascularization. Corneal neovascularization (Figure 1 and Figure 2) is characterized by the proliferation of multiple small blood vessels in the corneal stroma. There is often concurrent stromal inflammation and epithelial hyperplasia. In most cases of neovascularization, the primary insult is inflammation resulting from various causes. However, neovascularization can also develop in the cornea of laboratory rodents fed diets deficient in certain nutrients.

Recommendation: When neovascularization occurs without concurrent inflammation, it should be diagnosed and assigned a severity grade. When neovascularization is considered a feature of inflammation, it should not be diagnosed separately, unless warranted by severity, but should be described in the pathology narrative.



NTP Nonneoplastic Lesion Atlas

Eye, Cornea – Neovascularization

References:

Ecoiffier T, Yuen D, Chen L. 2010. Differential distribution of blood and lymphatic vessels in the murine cornea. *Invest Ophthalmol Vis Sci* 51:2436-2440.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/20019372>

Frame SR, Slone TW. 1966. Nonneoplastic and neoplastic changes in the eye. In: *Pathobiology of the Aging Mouse*, Vol 2 (Mohr U, Dungworth DL, Capen CC, Carlton WW, Sundberg JP, Ward JM, eds). ILSI Press, Washington, DC, 97-103.

Geiss V, Yoshitomi K. 1991. Eyes. In: *Pathology of the Mouse: Reference and Atlas* (Maronpot RR, Boorman GA, Gaul BW, eds). Cache River Press, Vienna, IL, 471-489.

Abstract: <http://www.cacheriverpress.com/books/pathmouse.htm>

Greaves P. 2007. Nervous system and special sense organs. In: *Histopathology of Preclinical Toxicity Studies: Interpretation and Relevance in Drug Safety Evaluation*, 3rd ed. Academic Press, San Diego, CA, 861-933.

Abstract: <http://www.sciencedirect.com/science/book/9780444527714>

Hoffart L, Matonti F, Conrath J, Daniel L, Ridings B, Masson GS, Chavane F. 2010. Inhibition of corneal neovascularization after alkali burn: Comparison of different doses of bevacizumab in monotherapy or associated with dexamethasone. *Clin Exp Ophthalmol* 38:346-353.

Full-text: <http://onlinelibrary.wiley.com/doi/10.1111/j.1442-9071.2010.02252.x/full>

National Toxicology Program. 1988. NTP TR-331. Toxicology and Carcinogenesis Studies of Malonaldehyde, Sodium Salt (3-Hydroxy-2-propenal, Sodium Salt) (CAS No. 24382-04-5) in F344/N Rats and B6C3F₁ Mice (Gavage Studies). NTP, Research Triangle Park, NC.

Abstract: <http://ntp.niehs.nih.gov/go/8898>

Pauly A, Brignole-Baudouin, Labbé A, Liang H, Warnet J-M, Baudouin C. 2007. New tools for the evaluation of toxic ocular surface changes in the rat. *Invest Ophthalmol Vis Sci* 48:5473-5463.

Full-text: <http://www.iovs.org/content/48/12/5473.full>

Smith RS, Hawes NL, Chang B, Nishina PM. 2002. Retina. In: *Systematic Evaluation of the Mouse Eye: Anatomy, Pathology, and Biomethods* (Smith RS, John SWM, Nishina PM, Sundberg JP, eds). CRC Press, Boca Raton, FL, 195-225.

Taradach C, Greaves P, Rubin LF. 1984. Spontaneous eye lesions in laboratory animals: Incidence in relation to age. *Crit Rev Toxicol* 12:121-147.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/6368130>



NTP Nonneoplastic Lesion Atlas

Eye, Cornea – Neovascularization

References:

Yoshitomi K, Boorman GA. 1990. Eye and associated glands. In: Pathology of the Fischer Rat: Reference and Atlas (Boorman GA, Eustis SL, Elwell MR, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, CA, 239-260.

Abstract: <http://www.ncbi.nlm.nih.gov/nlmcatalog/9002563>

Yudkin AM, Lambert RM. 1923. Pathogenesis of the ocular lesions produced by a deficiency of vitamin A. J Exp Med 38:17-24.

Full-text: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2128416/pdf/17.pdf>

Author:

Margarita M. Gruebbel, DVM, PhD, DACVP
Senior Pathologist
Experimental Pathology Laboratories, Inc.
Research Triangle Park, NC