



NTP Nonneoplastic Lesion Atlas

Stomach, Glandular Stomach – Erosion

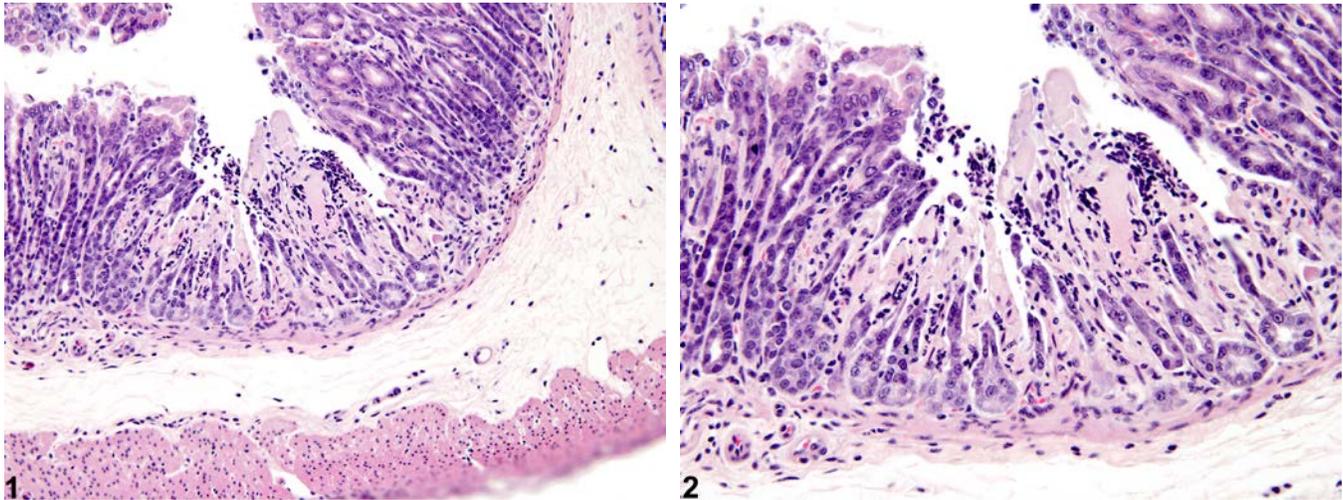


Figure Legend: **Figure 1** Stomach, Glandular stomach - Erosion in male B6C3F1 mouse from a subchronic study. The lesion does not extend through the entire mucosa. **Figure 2** Stomach, Glandular stomach - Erosion in male B6C3F1 mouse from a subchronic study (higher magnification of Figure 1). The lesion does not extend through the entire mucosa.

Comment: Spontaneous occurrence of erosion of the glandular stomach is uncommon in NTP studies in mice and F344/N rats. Erosions are seen primarily in treated rats. An erosion (Figure 1 and Figure 2) is a partial thickness of epithelial loss, compared with an ulcer (see Stomach, Glandular stomach – Ulcer), in which the entire epithelial thickness has been lost down to or through the basement membrane and muscularis mucosa. In comparison, necrosis of epithelium is diagnosed instead of erosion if the necrotic portion of the epithelium is still present and at least partially attached to the underlying viable epithelium. Bacterial infections can occur secondary to erosion or ulceration due to local trauma from a gavage procedure or necrosis/ischemia. Indigenous bacteria in the stomach of the rat are normally found adherent to only the most luminal mucosa but not in the gastric pits. Following erosion/ulceration, bacteria can gain access to deeper portions of the mucosa and stomach wall. Compounds that produce erosions and ulcers can act via effects on mucosal blood flow, mucosal cell kinetics, mucus or acid/bicarbonate secretion, or maintenance of the mucus barrier. High-fat diets, chronic pantothenic acid deficiency, deficiency of gluconeogenic amino acids, platelet-activating factor, increased reflux of bile salts, and reduced exocrine pancreatic function are associated with ulceration but only with intact vagal innervations. The mediators of ulceration may be metabolites of the lipooxygenase pathway of arachidonic acid metabolism. Age of maternal separation of rat pups from



NTP Nonneoplastic Lesion Atlas

Stomach, Glandular Stomach – Erosion

their mothers has been reported to affect susceptibility to development of immobilization-induced gastric erosions.

Recommendation: Erosion of the glandular stomach should be diagnosed and graded based on the extent and distribution of the lesions. Edema, inflammation, and hyperplasia of the adjacent epithelium should not be diagnosed separately unless they are a prominent component of the lesion. Necrosis of epithelium is diagnosed instead of erosion if the necrotic epithelium is still present and at least partially attached to the underlying viable epithelium.

References:

Ackerman SH, Hofer MA, Weiner H. 1975. Age at maternal separation and gastric erosion susceptibility in the rat. *Psychosom Med* 37:180–183.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/1079604>

Betton GR. 1998. The digestive system I: The gastrointestinal tract and exocrine pancreas. In: *Target Organ Pathology* (Turton J, Hooson J, eds). Taylor and Francis, London, 29-60.

Brown HR, Hardisty JF. 1990. Oral cavity, esophagus and stomach. In: *Pathology of the Fischer Rat* (Boorman GA, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, CA, 9-30.

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

Hirose M, Hakoi K, Takahashi S, Hoshiya T, Akagi K, Lin C, Saito K, Kaneko H, Shirai T. 1999. Sequential morphological and biological changes in the glandular stomach induced by oral administration of catechol to male F344 rats. *Toxicol Pathol* 27:448-455.

Abstract: <http://www.ncbi.nlm.nih.gov/pubmed/10485826>

Leininger JR, Jokinen MP, Dangler CA, Whiteley LO. 1999. Oral cavity, esophagus, and stomach. In: *Pathology of the Mouse* (Maronpot RR, ed). Cache River Press, St Louis, MO, 29-48.

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



NTP Nonneoplastic Lesion Atlas

Stomach, Glandular Stomach – Erosion

Authors:

Linda H. Kooistra, DVM, PhD, DACVP
Pathologist
Charles River Laboratories, Inc.
Research Triangle Park, NC

Abraham Nyska, DVM, Diplomate ECVP, Fellow IATP
Expert in Toxicologic Pathology
Visiting Full Professor of Pathology
Sackler School of Medicine, Tel Aviv University
Timrat Israel