



NTP Nonneoplastic Lesion Atlas

Urinary bladder, Urothelium – Hyperplasia

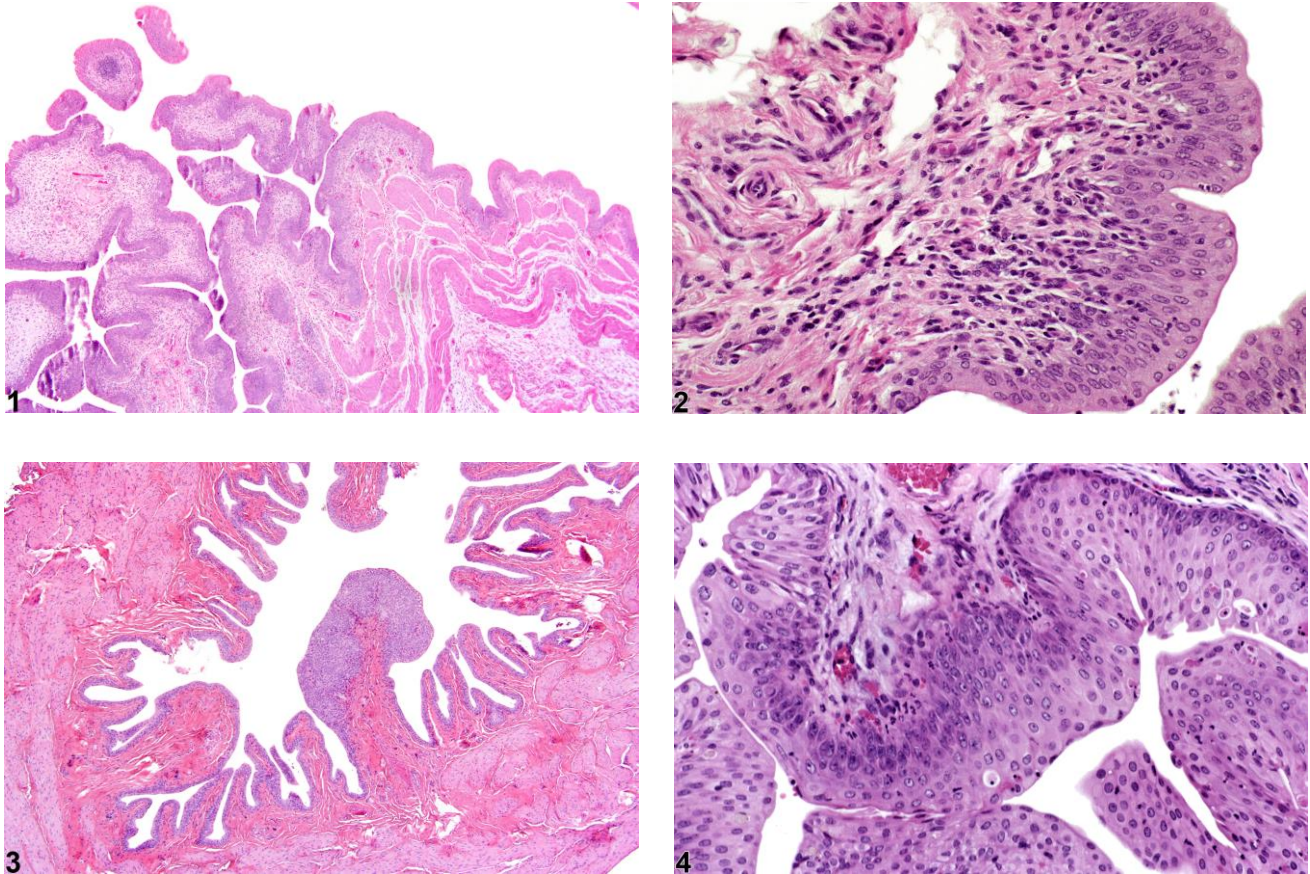


Figure Legend: **Figure 1** Urothelial hyperplasia (simple) from a male F344/N rat in a chronic study. **Figure 2** Urothelial hyperplasia (simple) with minimal inflammatory infiltration of epithelium and submucosa, from a female Harlan Sprague-Dawley rat in a chronic study. **Figure 3** Urothelial hyperplasia (nodular) from a male F344/N rat in a chronic study. **Figure 4** Urothelial hyperplasia with little to no inflammation, from a male TG/RASH2/CB6F1 mouse.

Comment: Urothelial hyperplasia, defined as an increased number of epithelial cells, is commonly observed with inflammation, with the presence of calculi, or as a response to chemical administration. In general, hyperplasia can either be simple, nodular, or papillary (Figure 1, Figure 2, Figure 3, and Figure 4), which may not be important to diagnose for occasional and spontaneous cases. Most cases of hyperplasia are focal to diffuse. Hyperplastic cells may be normal in appearance or pleomorphic, or (rarely) may have atypia. Mitotic figures are variable. Metaplastic foci of squamous, glandular, or mixtures of cell metaplasia may be



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noted. Urothelial hyperplasia may be reversible but may also progress to neoplasia. Hyperplasia is less commonly observed in the mouse. Minimal hyperplasia is difficult to diagnose because of the variability of the bladder appearance during fixation.

Recommendation: Usually a guideline of an increase above the normal 3- to 4-cell-thick urothelium constitutes hyperplasia. However, sectioning also poses a difficulty in determining minimal or borderline hyperplasias because of folding of the bladder lining in nondistended states. Care should be taken to not confuse tangential sectioning as hyperplasia. Hyperplasia should be diagnosed and given a severity grade. Hyperplastic modifiers such as “simple,” “nodular,” or “papillary” associated with chemical exposure should be discussed in the narrative report.

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