

NTP Nonneoplastic Lesion Atlas

Prostate – Inflammation, [Acute, Suppurative, Chronic, Chronic-active, Granulomatous]

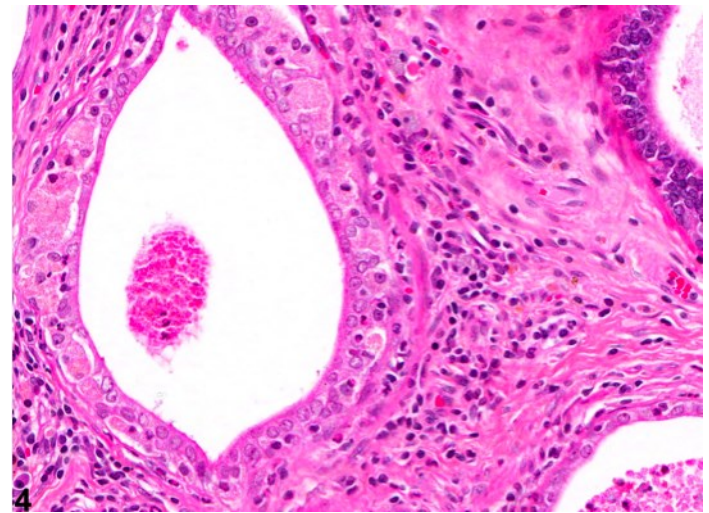
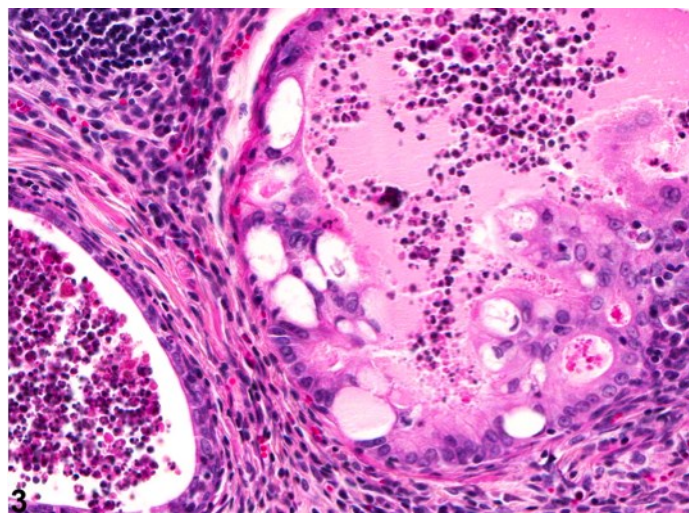
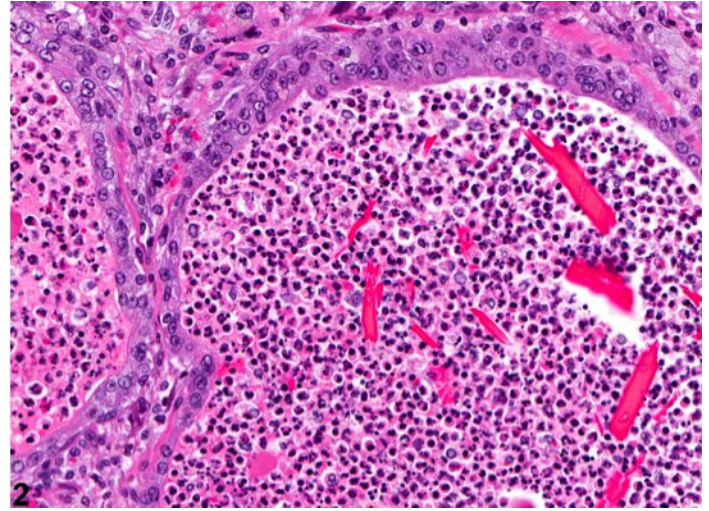
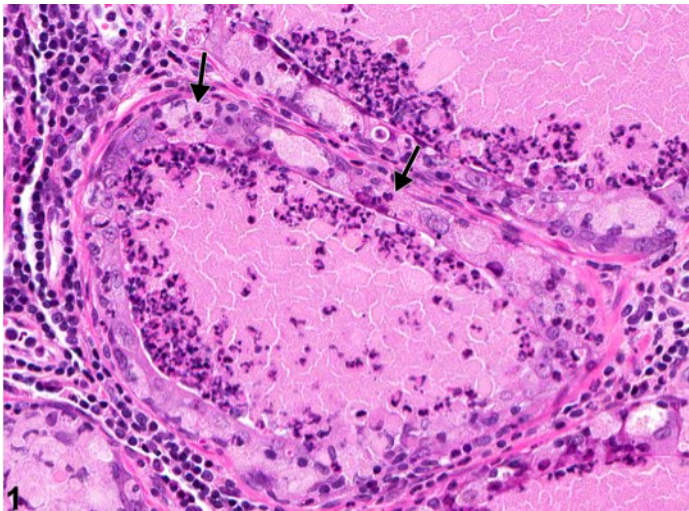
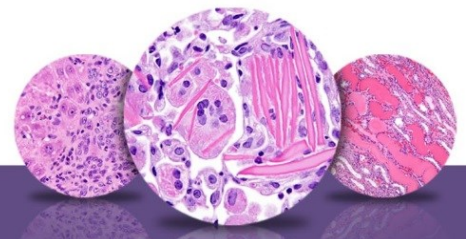


Figure Legend: **Figure 1** Prostate - Inflammation. Arrows indicate neutrophils passing through the acinar mucosa in a male F344/N rat from a chronic study. **Figure 2** Prostate - Inflammation. Suppurative inflammation of the prostate in a male F344/N rat from a chronic study. **Figure 3** Prostate - Inflammation. Inflammation of the prostate associated with epithelial degeneration in a male F344/N rat from a chronic study. **Figure 4** Prostate - Inflammation. Chronic inflammation of the prostate in a male F344/N rat from a chronic study.

Comment: Prostatitis is a common microscopic observation in rodents observed during the safety and chronic toxicity assessments of chemicals. Prostatitis can be acute (Figure 1), suppurative (Figure 2),



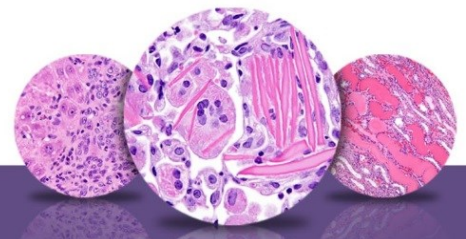
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chronic-active with neutrophils in acinar lumens and mononuclear cells in the interstitium (Figure 3), or chronic with interstitial fibrosis (Figure 4). The acinar lining epithelium may remain intact (Figure 1) or have evidence of degeneration, necrosis, or squamous metaplasia (Figure 2 and Figure 3). Neutrophils gain access to the acinar lumen by passing through the acinar mucosa (Figure 1, arrows). Inflammation can occur in any lobe of the prostate or involve multiple lobes. Chemical agents causing prostatitis in rodents are rare. However, prostatitis has been recorded in rats exposed to estrogenic agents perinatally.

In rats, transplacental exposure of atrazine, an agrochemical, results in prostatitis in the adult offspring. It is thought that estradiol-induced inflammation in the rat lateral prostate is mediated, at least in part, by the release of prolactin from the pituitary gland. Prostatic inflammation was demonstrated by experimental hyperprolactinemia induced by chronic administration of sulpiride, a dopamine D2 antagonist with antipsychotic effect.

NTP studies have five standard categories of inflammation: acute, suppurative, chronic, chronic-active, and granulomatous. In *acute inflammation*, the predominant infiltrating cell is the neutrophil, though fewer macrophages and lymphocytes may also be present. There may also be evidence of edema or hyperemia. The neutrophil is also the predominant infiltrating cell type in *suppurative inflammation*, but they are aggregated, and many of them are degenerate (suppurative exudate). Cell debris from both the resident cell populations and infiltrating leukocytes, proteinaceous fluid containing fibrin, fewer macrophages, occasional lymphocytes or plasma cells, and, possibly, an infectious agent may also be present in the exudate. Grossly, these lesions would be characterized by the presence of pus. The tissue surrounding the exudate may have fibroblasts, fibrous connective tissue, and mixed inflammatory cells, depending on the chronicity of the lesion. Lymphocytes predominate in *chronic inflammation*. Lymphocytes also predominate in *chronic-active inflammation*, but there are also a significant number of neutrophils. Both lesions may contain macrophages. *Granulomatous inflammation* is another form of chronic inflammation, but this diagnosis requires the presence of a significant number of aggregated, large, activated macrophages, epithelioid macrophages, or multinucleated giant cells.



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Recommendation: Prostatitis and its exacerbation by chemical agents should be graded and classified. The affected lobe(s) should be identified if possible and indicated in the tissue identification (e.g., prostate, lateral lobe - inflammation, suppurative, moderate). When paired lobes are affected, the diagnosis should indicate the inflammation is bilateral, and the severity grade should be based on the more severely affected lobe. Associated changes such as metaplasia or degeneration should not be diagnosed unless warranted by their extent and severity.

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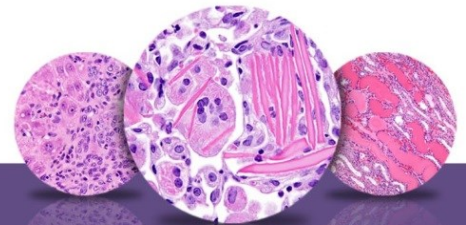
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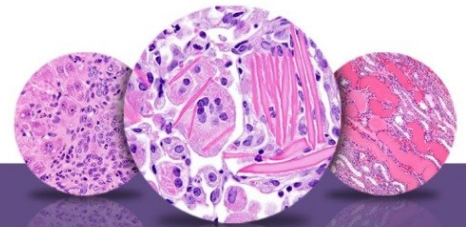
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