Corynebacterium kutscheri Infection, Liver, Mouse and Rat

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**Synonyms.** Pseudotuberculosis, corynebacteriosis, *Corynebacterium murium* infection

**Gross Appearance**

Infected animals often have no gross lesions, but clinically affected animals may be emaciated with starry coats, naso-ocular discharge, and dyspnea. Submandibular lymph nodes are enlarged. Lungs contain randomly distributed, single large to numerous miliary cream-colored foci surrounded by red zones. Single to several variably sized caseopurulent foci protrude from the hepatic capsule or lie deep within the parenchyma. Adhesions to pleura, pericardium, and peritoneum are frequent. Less frequently, similar foci can occur in kidney, heart, spleen, joints, skin, lymph nodes, prepuceal glands, and middle ears. Lesions are often restricted to lung and liver in rats, but liver and kidney lesions predominate in mice (Brownstein et al. 1985; Fauve et al. 1964; Ford and Joiner 1968; Giddens et al. 1968; Kutscher 1894; Matheson et al. 1955; Nelson 1973; Tadokoro et al. 1961; Weisbroth 1979; Giddens et al. 1968).

**Microscopic Features**

Regardless of tissue, lesions consist of microscopically small to grossly large foci of inflammation. The centers of each focus are necrotic, surrounded by a zone of leukocytic infiltration consisting initially of neutrophils and later of macrophages, lymphocytes, plasma cells, and fibroplasia (Fig. 176). Colonies of numerous small, gram-positive rods, arranged in irregular palisades, are present in the junctional zones between the necrotic centers and the reactive periphery (Figs. 177, 178; Weisbroth 1979; Giddens et al. 1968).

**Ultrastructure**

The ultrastructural features of this infection have not been reported.

**Differential Diagnosis**

Differential diagnosis of pulmonary abscesses must distinguish primarily those caused by *Mycoplasma, Streptococcus*, and *Mycobacterium*. The bacterial etiology of disseminated abscesses in other organs, particularly liver, include *Pseudomonas aeruginosa, Salmonella*, and *Streptococcus*. Gram stains and microbiologic examinations of abscesses provide definite diagnosis of *C. kutscheri* infection. Subclinical infections can be detected serologically or by culture of submandibular lymph nodes (Brownstein et al. 1985; Fox et al. 1987).

**Biologic Features**

**Natural History**

*C. kutscheri* infection was one of the earliest recognized rodent infectious diseases (Kutscher 1894) and still occurs today. The term “pseudotuberculosis” is an accepted synonym, al-
Fig. 176. (upper left) Liver, rat naturally infected with *Corynebacterium kutscheri*. A granulomatous lesion elevates the hepatic capsule. H&E, ×56

Fig. 177. (below) *Corynebacterium kutscheri* granuloma, liver, rat. The center of the lesion (upper right) contains necrotic debris, surrounded by a zone of mixed leukocyte infiltration. Colonies of *C. kutscheri* are visible at the junction between the necrotic center and outer reactive zone. H&E, ×175

Fig. 178. (upper right) Gran-positive *Corynebacterium kutscheri* organisms in the center and in dense colonies (near top) of a hepatic lesion in a rat. Brown and Brenn, ×440