

BORRELIAE FROM MUCOUS MEMBRANES

BORRELIAE FROM MUCOUS MEMBRANES are usually listed as *Borrelia buccalis* and *Borrelia vincentii* from the mouth and from the respiratory tract, and *Borrelia refringens* from the genitalia.

Data on these organisms are confused and meager, because the oral cavity under conditions considered normal, as well as ulcerative-necrotic lesions with low oxygen tension, may harbor organisms morphologically resembling borreliae.

Borrelia vincentii was described by Vincent in 1896 as the cause of the so-called fusospirochetal infections, among which is Vincent's angina (706). Uohara and Knapp (695) presented a review of oral lesions associated with this organism.

B. vincentii is 5 to 10 μ long, and has 3 to 8 irregular spirals. Long, filamentous forms have been observed frequently in cultures. Bladden and Hampp (79) studied the ultrastructure of this organism. It has a triple-structured wall, with cylindrical protoplasm, and intracellular concentric laminations. There are an axial filament and several fibers, usually terminating in small knobs, as well as a large number of fibrils.

Not all strains produce metabolic gas (423).

Canale-Parola *et al.* (142) described a medium for the culture of *B. vincentii*. This consists of desiccated Spirolate Broth (Baltimore Biological Laboratory) 1 Gm, desiccated Brain Heart Infusion Broth (B.B.L.) 1.66 Gm, sodium thioglycollate 22.25 mg, asparagine 25 mg, Tryptone (Difco) 25 mg, gelatin 2 Gm, and

distilled water 90 ml. The pH is adjusted to 7.0. After sterilization, 10 ml inactivated rabbit serum are added.

B. vincentii is susceptible to lysis by lysozyme (518). Antigenically, it differs from other treponemes (493).

Fusiform bacilli are frequently found in lesions together with *B. vincentii*. Tunnicliff (692) suggested that they are different phases of the same organism.

B. vincentii has been isolated from acute gingivitis with painful, edematous, and ulcerated interdental papillae and marginal gingivae, from ulceronecrotic gingivostomatitis, aphthous lesions, pharyngeal ulcers and tonsils covered with strongly adherent, dirty gray membranes, peritonsillar abscess, regional lymphadenitis, and lung lesions. The disease has been designated as trench mouth, Vincent's disease, Vincent's angina, ulceronecrotic gingivostomatitis, ulceromembranous stomatitis, pseudomembranous gingivitis, fusospirochetal disease, and so on. Pain, malaise, fetid breath, bleeding, salivation, and sometimes fever with leukocytosis, shift to the left, increased blood sedimentation rate, and at times gangrene are present. When the infection is restricted to the mouth, punched-out, easily bleeding ulcers of the gums are seen. Pseudomembrane formation, noma, gangrenous laryngitis, and destruction of the gums to such an extent that the teeth fall out, as well as erosions of the bones of the oronasopharyngeal region, have been ascribed to *B. vincentii*. If the buccal mucosa is involved, more diffuse pseudomembranous lesions develop. Rectal and vaginal lesions have been reported.

The disease is more common in the undernourished, principally in children, and during wartime and other disasters (13). It has been suggested that lack of one or more vitamins may predispose to this infection.

Black (78) emphasized, however, that herpetic infections may cause acute gingivostomatitis. He investigated the oral cavity of healthy children for the presence of *B. vincentii* and found this organism in 60% of those examined. Fusiform bacilli were demonstrated in 94% of the same group, and *B. vincentii* and fusiform bacilli together in 18 to 63% of the children, according to age. It is, therefore, difficult to ascribe primary pathogenicity to *B. vincentii*.



FIGURE 31. Necrotic ulcerative areas between and around the maxillary front teeth, and the central incisor region. Some necrotic and ulcerative areas also around the anterior mandibular teeth. Description and photograph by courtesy of M. N. Wilderman, D.D.S., Professor and Head, Department of Periodontology, Louisiana University School of Dentistry, New Orleans, La.

Malberger (466) in Gambia observed necrotic and ulcerative lesions of the interdental papillae in poorly nourished children with inadequate oral hygiene, with numerous *B. vincentii* present. Goldberg (319), Uohara (694), van der Veld (703), and Knox (416) reviewed "trench mouth" and acute ulcerative gingivitis. Apparently opinions concerning the pathogenic role of *B. vincentii* are divided.

The differential diagnosis must consider diphtheria, coccal infections, and malignancy.

Hydrogen peroxide, antibiotic lozenges, and zinc paste locally, and recently Metromidazole® (275) have been recommended. A mouth wash with tepid 5 to 10% sodium bicarbonate or saline is often prescribed. Vitamins C and B complex are frequently administered.

A patient with gingivitis belongs under the dentist's care.

Vincent's angina and related deeper lesions are treated either with procaine penicillin, 600,000 units daily, intramuscularly, or

with tetracycline, 20 mg per Kg body weight orally, for one week.

It may be added that reports on long lasting *B. refringens* infections still appear when vulvovaginitis and balanitis are discussed in East Europe (671) but other organisms, including *Mycoplasma*, are considered the causative agents in the West.