Dental plaque is a sticky, colorless, biofilm that collects between and on the surface of the teeth. It contains a mixture of bacteria, salivary proteins, and desquamated epithelial cells. If plaque is not removed, it becomes mineralized to form *calculus* (tartar). Plaque build-up beneath the gumline can lead to gingivitis, which is characterized by gingival erythema, edema, bleeding, changes in contour, and loss of soft tissue adaptation to the teeth. Gingivitis occurs at any age but is most prevalent and severe in adolescence (ranging from 40% to 60%). In addition, the bacteria in the plaque release acids from sugar-rich foods, thereby eroding the enamel surface and contributing to the development of caries. Gingivitis is a reversible disease; therapy is primarily aimed at reducing the accumulation of plaque and calculus via regular brushing, flossing, and dental visits.

Periodontitis

Periodontitis is an inflammatory process that affects the supporting structures of the teeth (periodontal ligaments) alveolar bone, and cementum. Periodontitis can lead to serious sequelae, including complete destruction of the periodontal ligament, which is responsible for the attachment of the teeth to the alveolar bone, leading to loosening and eventual loss of teeth. Periodontal disease is associated with a marked shift in the types and proportions of bacteria along the gingiva. Poor oral hygiene, with resultant change in oral flora, are believed to be important in the pathogenesis of periodontitis. For the most part, facultative gram-positive organisms colonize healthy gingival sites, while plaque within areas of active periodontitis contains anaerobic and microaerophilic gram-negative flora. Although 300 types of bacteria reside in the oral cavity, adult periodontitis is associated primarily with *Aggregatibacter (Actinobacillus) actinomycetemcomitans*, *Porphyromonas gingivalis*, and *Prevotella intermedia*.

While it typically presents without any associated disorders, periodontal disease can be a component of systemic disease, including acquired immunodeficiency syndrome (AIDS), leukemia, Crohn disease, diabetes mellitus, Down syndrome, sarcoidosis, and syndromes associated with defects in neutrophils (Chédiak-Higashi syndrome, agranulocytosis, and cyclic neutropenia). In addition, periodontal infections can be the origin of important systemic diseases, including infective endocarditis, and pulmonary and brain abscesses.

Inflammatory/Reactive Lesions

Aphthous Ulcers (Canker Sores)

Aphthous ulcers are common, often recurrent, exceedingly painful, superficial oral mucosal ulcerations of unknown etiology. They affect up to 40% of the population, and are most common in the first 2 decades of life. Aphthous ulcers tend to be prevalent within certain families and may also be associated with immunologic disorders including celiac disease, inflammatory bowel disease, and Behçet disease. The lesions appear as single or multiple, shallow, hyperemic ulcerations covered by a thin exudate and rimmed by a narrow zone of erythema (Fig. 16-1). The underlying inflammatory infiltrate is at first largely mononuclear, but secondary bacterial infection may result in a neutrophilic infiltrate. The lesions typically resolve spontaneously in 7 to 10 days, but may sometimes persist stubbornly for weeks, particularly in immunocompromised patients.

Figure 16-1 Aphthous ulcer. Single ulceration with an erythematous halo surrounding a yellowish fibrinopurulent membrane.

Fibrous Proliferative Lesions

The *irritation fibroma*, also called traumatic fibroma and focal fibrous hyperplasia, is a submucosal nodular mass of fibrous connective tissue stroma that occurs primarily on the buccal mucosa along the bite line or the gingiva (Fig. 16-2). It is believed to be a reactive proliferation caused by repetitive trauma. Treatment is complete surgical excision.

The *pyogenic granuloma* (Fig. 16-3) **is an inflammatory lesion typically found on the gingiva of children, young adults, and pregnant women (pregnancy tumor).** The surface of the lesion is often ulcerated and red to purple in color. In some cases, growth is alarmingly rapid, raising the fear of malignancy. Histologically these lesions demonstrate a highly vascular proliferation of organizing granulation tissue. Pyogenic granulomas can regress, mature into dense fibrous masses, or develop into a peripheral

Figure 16-2 Fibroma. Smooth pink exophytic nodule on the buccal mucosa.