



**Figure 5-1.** A 56-year-old female patient with severe xerostomia and the classic presentation of (A) frothy saliva, (B) multiple restorations, and (C) new caries despite good oral hygiene, daily fluoride, and regular professional preventive care.

## ANATOMY OF THE DENTOALVEOLAR COMPLEX

The oral environment is an integrated system of hard and soft tissues, saliva, and a complex oral microbiome described as the sialo-microbial-dental complex (Mount, Hume, Ngo, & Wolff, 2016). Together they function to facilitate the chewing, tasting, and swallowing of food necessary for survival. When the sialo-microbial-dental complex is in homeostasis, oral health is maintained, but a shift in any one of the three increases the risk of oral diseases, including dental caries, periodontal diseases, and other oral infections. This chapter specifically addresses the role of diminished saliva on oral diseases in the context of the entire sialo-microbial-dental complex.

Saliva initiates digestion; aids in the mastication of food; facilitates speech, swallowing, and taste; and is essential to maintaining the health of oral tissues. A biofilm composed of water, salivary secretions, and microorganisms forms a semipermeable membrane that coats the teeth. In a healthy mouth, the microbial ecosystem functions symbiotically to maintain oral health. Diets high in fermentable carbohydrates and acids or alterations in the quality and quantity of saliva lead to changes in the microbiota with a resulting increased risk of dental caries and erosion (sometimes referred to as *corrosion*), oral infections, poor denture retention, and mucositis. When a diet high in sugars and acids and diminished salivary flow coexist, the disease risk is substantially magnified.

### Mandible and Maxilla

The dentoalveolar complex includes the maxilla, mandible, muscles of mastication, teeth, and periodontium. The maxilla and mandible are the dento-osseous structures that support the teeth. The maxilla (upper jaw) is the fused upper bone of the jaw that has osseous articulations with other bones to form the hard palate, the floor of the nasal cavity, and much of the bony framework of the facial structure. The mandible (lower jaw) has no osseous union with cranial bones but has a movable joint that articulates bilaterally at the temporomandibular joint. The muscles of mastication create the hinge and gliding motions of the mandible that facilitate mastication, yawning, and speech (Wheeler & Ash, 1984). The alveolar processes are the portions of the mandible and maxilla that support the teeth.

### Tooth Anatomy

As depicted in Figure 5-2, teeth are living organs with crowns and roots that are composed of four different tissues: enamel, dentin, cementum, and pulp. Dentin forms the majority of the mineralized structure of the crown and the root of the tooth. Enamel overlays the dentin of the crown, and cementum coats the root of the tooth. The pulp is internal to the dentin and is the one tooth tissue that is not normally mineralized.