Adam and Eve had many advantages, but the principal one was that they escaped teething.

Mark Twain

TALK ABOUT MULTITASKING! Teeth tear and grind food so that it can be digested; they provide shape to the mouth and assist in verbal communications. These hard structures are not visible or functional at birth. During the first three years, however, they painfully erupt through the gums and form two sets of ten evenly spaced teeth on the top and bottom of the mouth. Eventually, these baby, or primary teeth, are displaced by 32 permanent teeth of different shapes and functions.

Teeth are the hardest substances in the body, but they are still susceptible to trauma and disease. In fact, teeth are made up of various parts, any one of which can be the source of a dental problem. Anyone who has had root canal surgery can attest to the fact that because of the anatomical location of the nerve root, this procedure is a lot different than a mere surface cavity repair.

Dental trauma and personal injury claims are no strangers. Lawsuits have been advanced by people who have either fractured or loosened their teeth during an accident. Moreover, those who have bitten down on a foreign object while eating have also advanced litigation. Dentists have been sued for breaking a needle in a patient’s gum or for causing a nerve injury during the administration of anesthesia. Even Coca-Cola has been sued on the basis that its soft drink caused the plaintiff’s teeth to decay. By having a basic understanding of the anatomy and function of teeth, practitioners will have an easier time in presenting or defending a dental injury claim. This chapter provides an anatomical overview of this important body structure and highlights some of the dental issues that have arisen in a litigation context.

STRUCTURE OF TEETH • Even though teeth differ in size and shape, their basic structure is the
same. Teeth are made up of three parts: the crown, neck, and root. For Example: See Figures 19-1 and 19-2. The crown is the part of a tooth visible above the gum line, and it, too, has several parts. This white-appearing part of the tooth is made up of enamel. The enamel varies in size and is the thickest over the biting and chewing edges.

Microscopically, the enamel is made up of a great number of tiny rods that are arranged parallel to each other, with the inner part touching the dentin, or surface just under the enamel, and the outer end forming the surface of the tooth. Enamel is the hardest and most compact portion of the tooth. It is estimated that enamel can withstand crushing pressures of about 100,000 pounds per square inch, but it has no regenerative powers.¹ The crown acts as a protective barrier for the internal parts of the tooth.

Immediately below the outer surface of the crown lies the dentin or largest part of the tooth. This hard and porous substance resembles bone, is elastic, and has a yellowish color. The purpose of dentin is to support the brittle enamel that forms the outer surface of the tooth and to provide a hard outside shell for the internal pulp and roots of the tooth. Dentin consists of tubules that are aligned parallel to each other and abut the enamel at the top of the tooth and the pulp on the inner side.

The inside of the tooth is filled with pulp, a combination of living tissue, nerves, and blood that nourish and provide sensation to this structure. This material enters the tooth through the end of the root known as the foramen. The pulp is also the area of the tooth that responds to cold or hot stimulation and sends signals to the brain in very much the same manner that the sensory nerves of the body operate. The fluid from the pulp bathes the dentin, allowing it to maintain its elasticity, and pulp is responsible for the formation of new dentin.

The neck of the tooth is simply described as a constriction separating the crown from the root of the tooth.

The root resembles the bottom part of an iceberg. For Example: See Figure 19-3. This invisible piece is below the gum line and anchors the tooth into the jaw or alveolar process. The number of roots varies from one to three, and these anchors are always larger than the visible surface of the tooth.
Periodontal ligaments are small fibers that bond the roots of the teeth to the bone. Cementum is a pale yellow material that acts as glue to secure the roots of the teeth to the ligaments, and thus the wall of the tooth socket. Cementum resembles bone in composition and covers the roots of the teeth in thin layers. Cementum also overlaps the enamel of the teeth for a short distance. As people age, this material creates secondary dentin that constricts the pulp canal. This process makes the area smaller or eliminates the pulp all together.

**Arches Of The Mouth**

Two arches form the shape of the mouth: the maxillary and mandibular arches. The maxillary arch is that part of the skull that forms the upper jaw. For Example: See Figure 19-4. It consists of two irregularly shaped bones in the face that hold the upper teeth in place. The maxillary arch also connects to the left and right cheeks or zygomatic bones.

On the other hand, the mandibular arch is made up of the mandible, or lower jaw. For Example: See Figure 19-5. This bone is the largest in the face and holds the lower teeth in place. When a normal anatomical arrangement is present, the upper arch is larger than the lower one and the upper teeth overlap the lower ones.

**Tissue Of The Mouth**

Periodontal tissue covers the bones of the mouth. For Example: See Figure 19-6. This tissue is integral in supporting and maintaining the teeth in the oral cavity. In turn, the teeth are anchored into the bones of the mouth by periodontal ligaments. These ligaments allow for some slight movement of the teeth within the bones and are sensory to the pressure applied to the teeth. If a dentist has ever taken “pocket depth measurements” of your gums, a numerical calculation of the periodontal attachment to the teeth and bones is being made to determine the extent of gum disease. If periodontal disease is present in only the gums, the process is called gingivitis. When the connecting tissues and bone are involved, the problem is known as periodontitis.
Gingiva is the proper name of the gums. Healthy tissue is smooth and pink, but gingiva may take on a darker appearance in people of color. Gingiva is made up of fibrous tissue closely attached to the bone and surrounding the neck of the tooth, thereby creating a crevice called the gingival sulcus. In healthy individuals, this crevice is one to three millimeters deep. Between each tooth, this gingival tissue forms a triangular peak called the papilla, which closes the space between each tooth.

The Form And Function Of Teeth

Teeth are divided into categories depending upon their form and function. They include the incisors, canines, premolars, and molars. As noted in the beginning of this chapter, humans have two sets of teeth during their lifetime.

The first set is the primary teeth, and the second group is the permanent teeth. Primary teeth are also known as deciduous, baby, or milk teeth and consist of 20 units evenly divided between the top and bottom jaws. The visible teeth in the front and center of the mouth are the central incisors. These teeth resemble thin cutting blades that are used to rip food apart. The next tooth on either side is the lateral incisor. This tooth is followed by the canines or cuspids. These long teeth, which are also called the eyeteeth, resemble fangs and are the most stable in the mouth. The next structures are the primary molars. These teeth are replaced by the permanent premolars or bicuspids. They generally erupt by the time a child reaches 12 years of age. The remaining teeth are molars and are used to grind food, so they have a wider surface than the other teeth.

The molars in the upper jaw are dubbed the maxillary molars because of their position in the maxillary bone. The molars in the lower jaw are the mandibular molars, which have two roots providing the teeth with very strong anchorage against the forces that try to unseat them.

Teeth have their own numbering system. According to the American Dental Association, there are two major classifications for identifying the teeth. The Universal/National System is used primarily in the United States, and the International Standards Organization System is utilized in most other countries. The Universal/National System provides a number for each permanent tooth from one to 32. For Example: See Figure 19-7.

Primary Teeth

Baby teeth look the same as their adult counterparts but are smaller in all dimensions. The deciduous teeth start to form around the sixth week of fetal development and are characterized by large dental pulps consisting of a nerve and blood supply. These structures serve as space maintainers until they are replaced by the permanent teeth. Their roots are very thin as compared with their permanent counterparts. The tooth buds, which will eventually replace the baby teeth, form below the roots. As the permanent teeth develop and grow, these roots slowly reabsorb, allowing the permanent teeth to erupt through the gums.

Eruption of baby teeth, roughly, follows the following timing sequence:

- Lower central incisors—6 to 9 months of age
- Upper central incisors—8 to 10 months of age
- Upper and lower lateral incisors—8 to 12 months of age
- First molars—15 to 21 months of age
- Canines—16 to 20 months of age
- Second molars—20 to 24 months of age

It must be noted that there is great variation in this timing sequence, but most two-year-old children have a full complement of primary teeth.