Lec. 18

**Dr. Hulal Saleh**

The **root of the tooth** begins to develop after the formation of enamel and dentine is well advanced. The outer and inner enamel epithelia come together

at the neck of the tooth where they form a fold—the **Hertwig’s epithelial root sheath**. This sheath grows in the mesenchyme and initiates the formation of the root.

The odontoblasts adjacent to root sheath produce dentine, which is continuous with that of the crown. As more and more dentine is produced, the **pulp** **cavity** narrows and forms the **pulp canal** through which nerve and vessels pass.

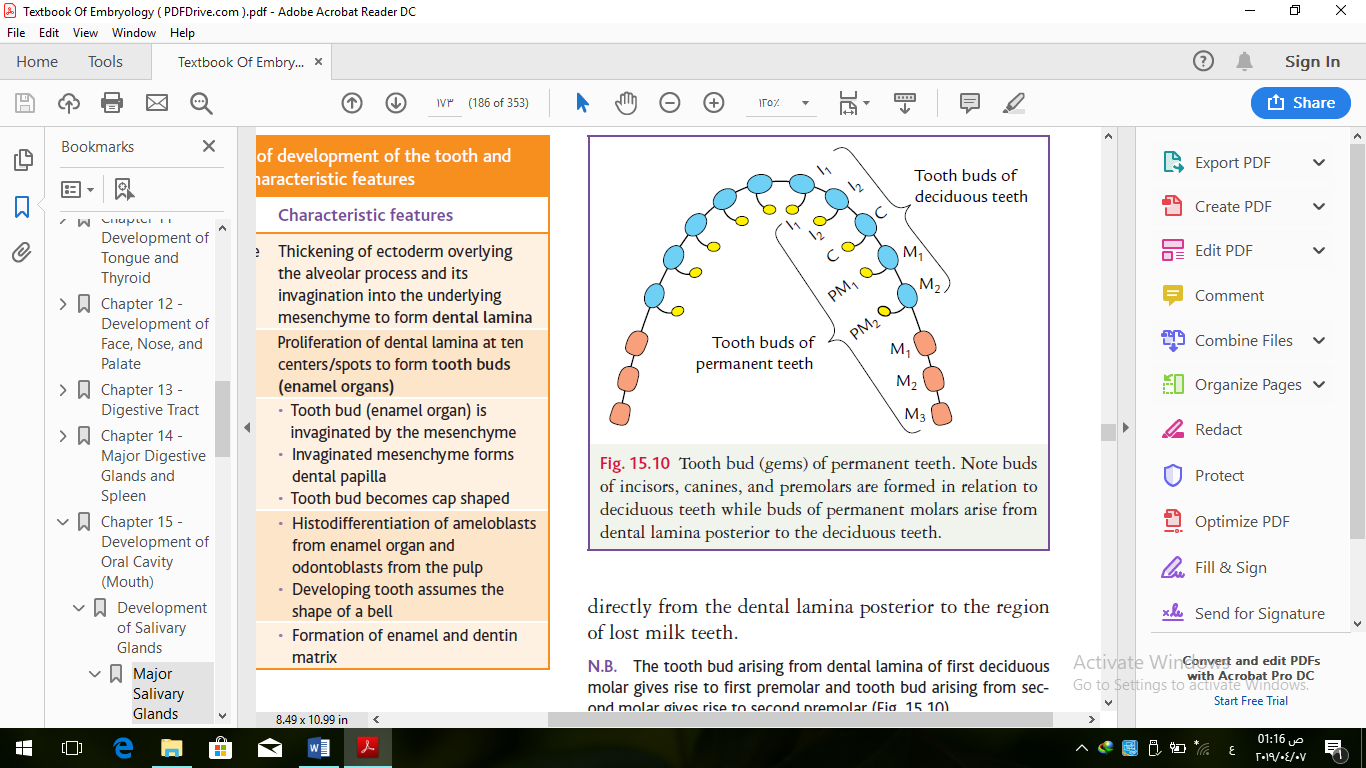
The inner cells of dental sac differentiate into **cementoblasts** that produce the cementum (a specialized bone).

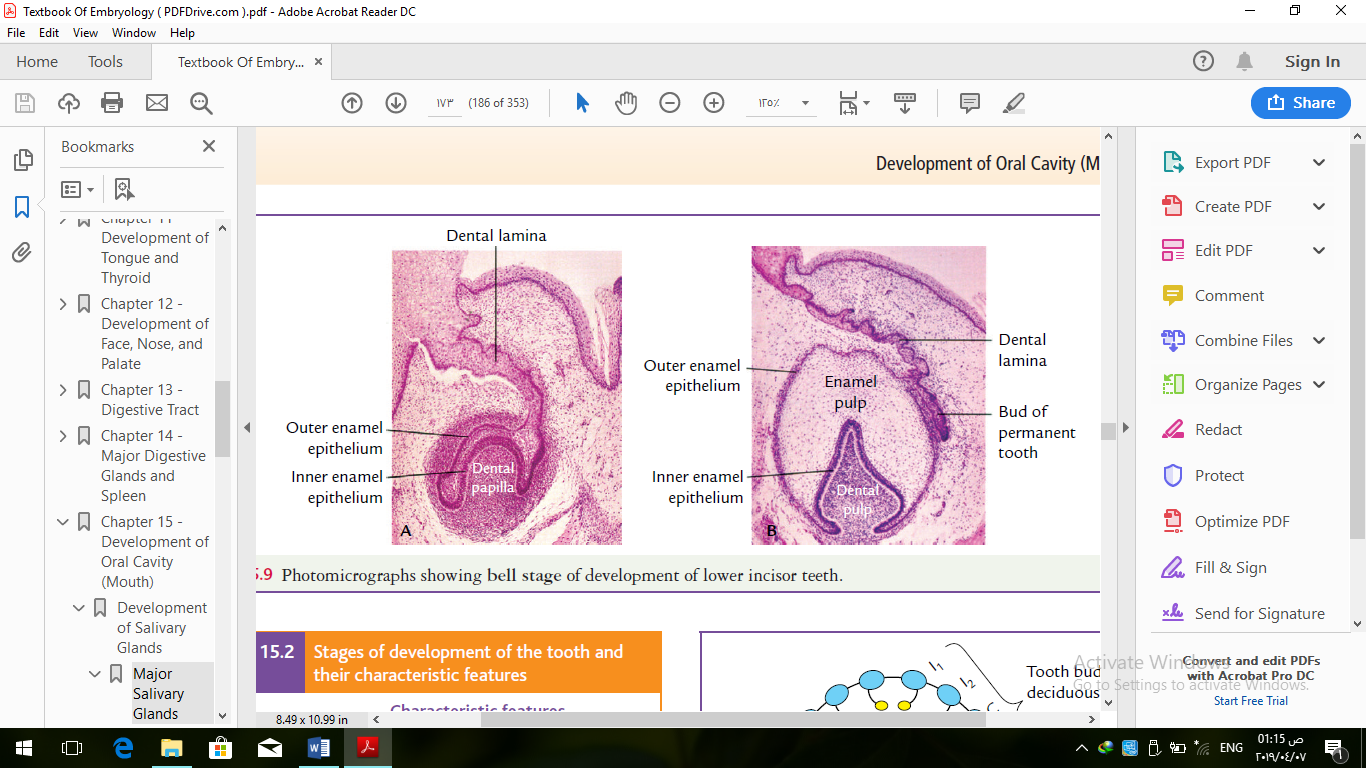
The mesenchyme cells of the outside cement layer give rise to the **periodontal ligament** that holds the root of the tooth firmly with the bony alveolar socket

and also functions as a shock absorber. With further elongation of the root, the crown of the tooth is pushed through the overlying tissue of alveolus into the oral cavity, i.e., **eruption occurs**.

**Development of Permanent Teeth**

The permanent teeth are 32 in number, 16 in each jaw. They develop in a manner similar to that of deciduous teeth.





During the third month of IUL, the dental lamina gives off a series of tooth buds on the lingual (medial) side of developing deciduous teeth. They give rise to permanent incisors, canines, and premolars.

These buds remain dormant until about sixth year of postnatal life. As the tooth buds of permanent teeth grow, they push the deciduous teeth up from below. As

a result the deciduous teeth are shed off. As the permanent teeth grow, the roots of overlying deciduous teeth are reabsorbed by osteoclasts.

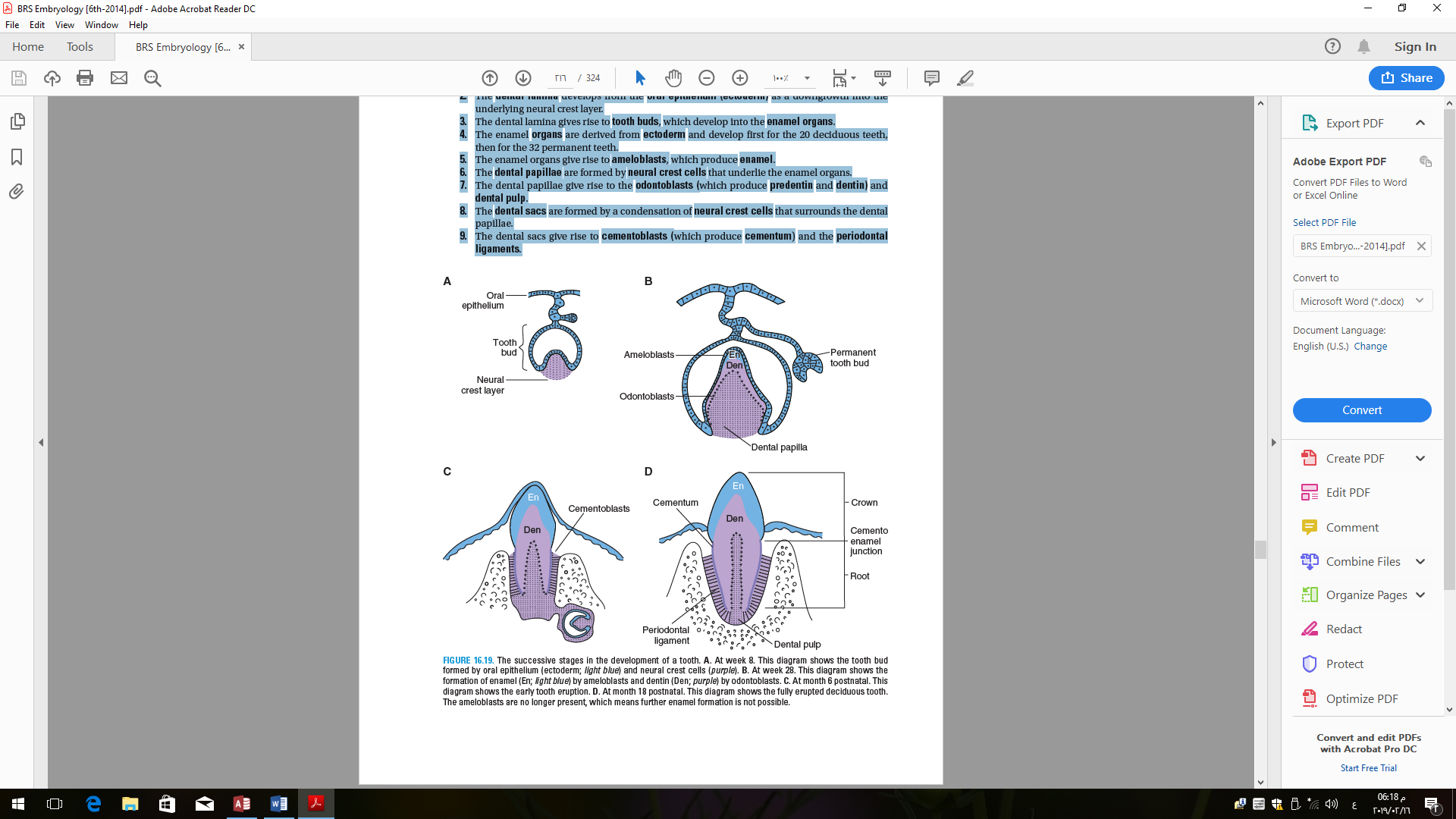
The permanent molars do not develop from tooth buds arising from dental lamina forming deciduous teeth; rather they are formed from tooth buds that arise directly from the dental lamina posterior to the region of lost milk teeth.

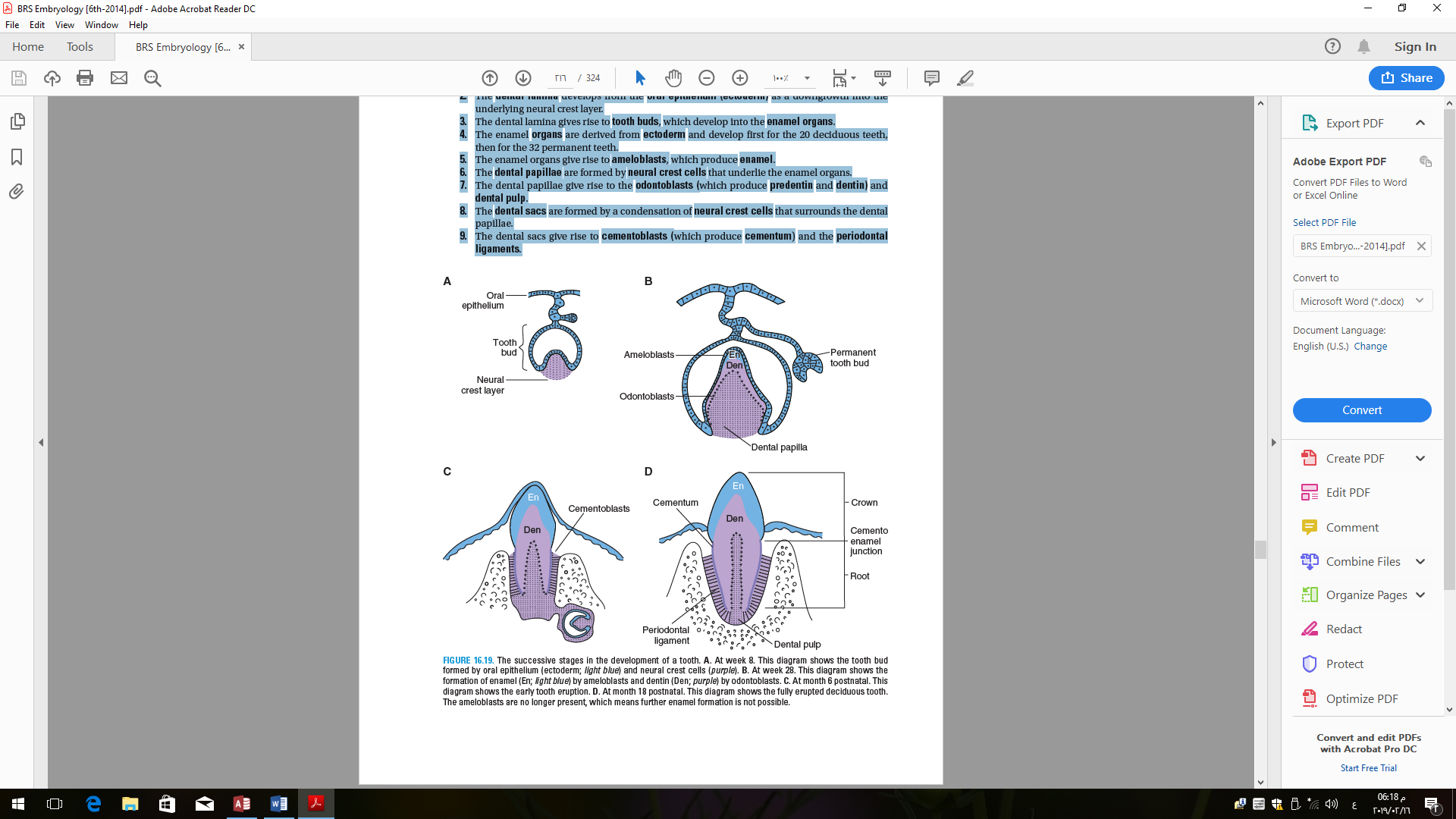
**N.B.** The tooth bud arising from dental lamina of first deciduous molar gives rise to first premolar and tooth bud arising from second gives rise to second premolar. Thus, 20 deciduous or milk teeth are replaced by 32 permanent teeth.

Deciduous teeth are two incisors, one canine, and two molar, they begin to erupt at about 6 month of postnatal life, and all get erupted by the end of second year or soon after. The teeth of the lower jaw erupt somewhat earlier than the corresponding teeth of the upper jaw.

Permanent teeth are two incisors, one canine, two premolars, and three molars.

The permanent teeth begin to erupt at about 6 years and all get erupted by 18–25 years.





The shape of the face is determined not only by expansion of the paranasal sinuses but also by growth of the mandible and maxilla to accommodate the teeth.

**Clinical considerations**

***Congenital anomalies of the teeth***

**1. Anodontia:** The complete absence of tooth or teeth is called *anodontia*. In this condition one or two teeth may be absent.

**2. Supernumerary teeth (extra teeth):** The extra tooth may be located posterior to normal teeth or wedged between the normal teeth disrupting positions of the teeth. The alignment of upper and lower teeth may be improper

(**malocclusion**). Sometimes the total number of teeth may be even less.

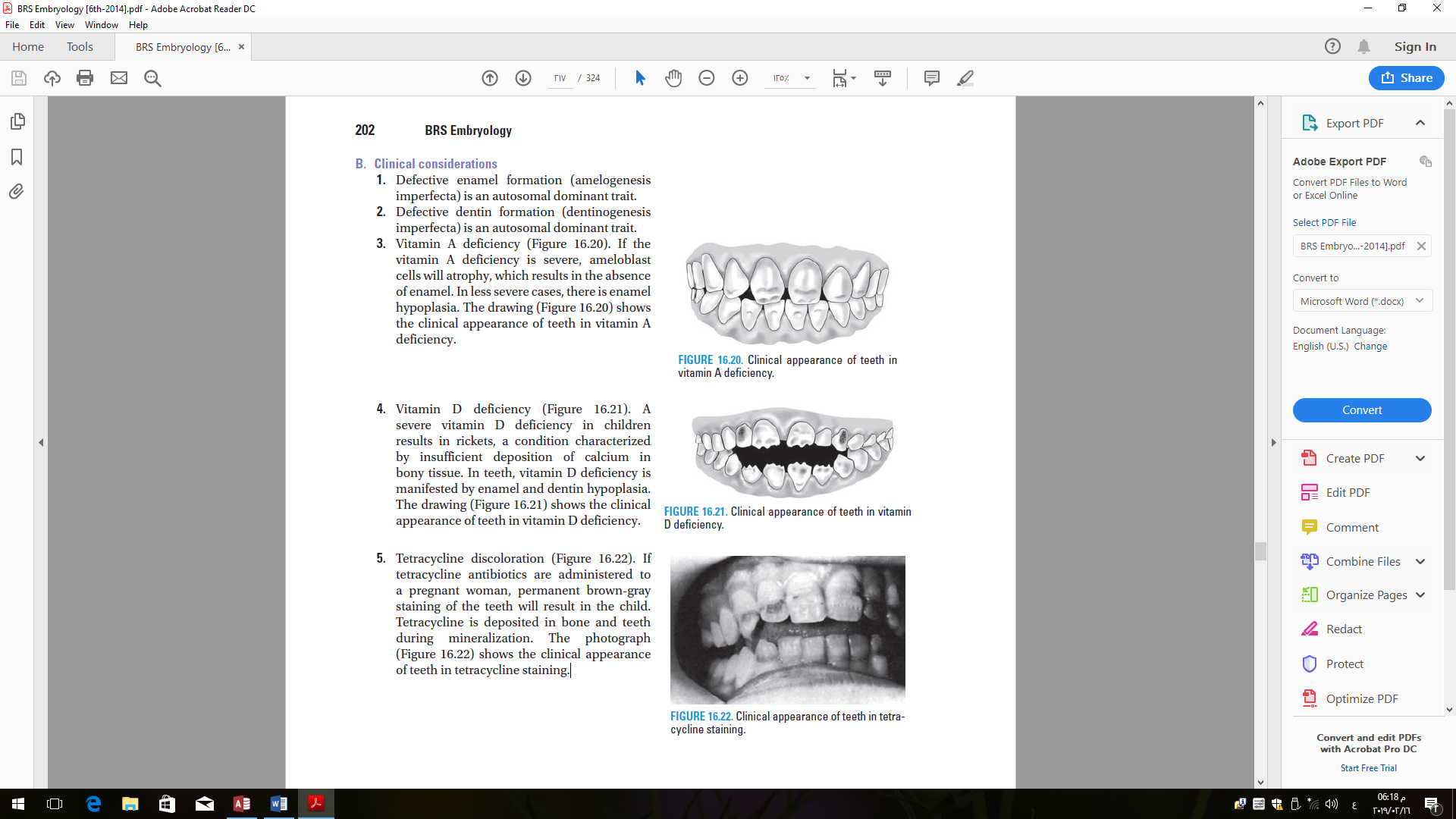
**3. Natal teeth** (eruption of teeth before birth): Sometimes teeth are already erupted at the time of birth. These are called *natal teeth*. Such teeth may cause injuries to nipple during breast feeding time.

**4. Fused teeth:** This condition occurs when a tooth bud divides or two tooth buds partially fuse with each other.

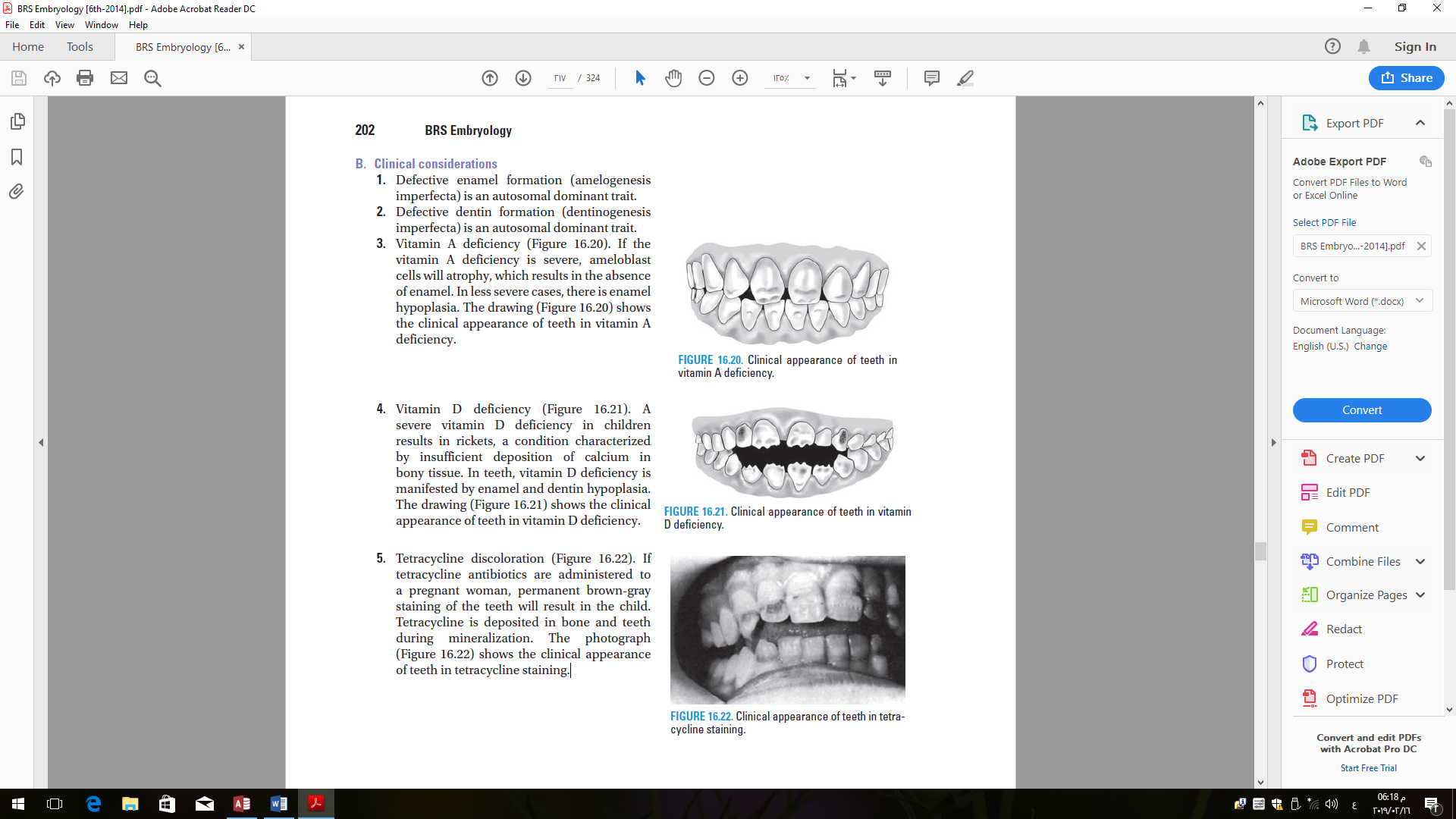
**5. Impaction of tooth:** In this condition there is a delay in the eruption of tooth. It commonly involves last (third) molar tooth.

**6.** Defective enamel formation (amelogenesis imperfecta) is an autosomal dominant trait.Defective dentin formation (dentinogenesis imperfecta) is an autosomal dominant trait.

**7.** Vitamin A deficiency. If the vitamin A deficiency is severe, ameloblast cells will atrophy, which results in the absence of enamel. In less severe cases, there is enamel hypoplasia



**8.** Vitamin D deficiency. A severe vitamin D deficiency in children results in rickets, a condition characterized by insufficient deposition of calcium in bony tissue. In teeth, vitamin D deficiency is manifested by enamel and dentin hypoplasia.



**9.** Tetracycline discoloration. If tetracycline antibiotics are administered to

a pregnant woman, permanent brown-gray staining of the teeth will result in the child. Tetracycline is deposited in bone and teeth during mineralization

