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| 1B-2 |
| **Pathology Question:** |
| What causes alveolar bone to decrease, following a tooth extraction? |
| **Report:** |
| To begin, the basic function of the bone surrounding the teeth, (alveolar bone), serves one major purpose: to hold and support teeth. However, when a tooth is extracted, this surrounding alveolar bone sees resorption. This process can be understood by physiological law, according to which the maintenance of the bone anatomy requires a certain daily stress/strain stimulus. In essence, the bone recedes because it no longer has a tooth to surround it. The loss of occlusion, (removal of chewing pressure and stimulus in particular) cause this decrease in alveolar bone. When a tooth is actually present, and makes contact with opposing teeth, the force is transmitted down to the roots and into surrounding bone. This stimulates osteoblasts to go to work. Without these forces present, these cells cannot properly function and the bone gradually decreases.  It is said that within the first year after tooth extraction, around 25-30% of bone is loss and continues if there is no intervention. More specifically, most of the bone loss is said to occur within the first six months following extraction. Studies have indicated that alveolar ridge resorption is more severe on the buccal side when compared to the lingual (approximately 2mm greater on the buccal side).  In an effort to maintain adequate alveolar bone after extraction of a tooth, as well as to minimize resorption, there has been continual research examining the efficacy of different biomaterials in preserving extraction sockets. The use of grafting materials to slow socket resorption has become more and more used clinically. The tooth must be replaced, and in specific, the tooth’s root must be replaced as soon as possible through treatment such as dental implants.  Some risks associated with losing bone in the area of a missing tooth include gum and bone recession on neighboring teeth, weakening of bone and increased risk of jaw fracture, and ultimately, it could result in poor prognosis for implant therapy if not taken care of in a timely manner. |
| **References:** |
| Hansson, Stig, and Anders Halldin. “Alveolar ridge resorption after tooth extraction: A consequence of a fundamental principle of bone physiology.” *Journal of dental biomechanics* vol. 3 (2012): 1758736012456543. doi:10.1177/1758736012456543  Lin, Hsi Kuei et al. “Prevention of Bone Resorption by HA/β-TCP + Collagen Composite after Tooth Extraction: A Case Series.” *International journal of environmental research and public health* vol. 16,23 4616. 21 Nov. 2019, doi:10.3390/ijerph16234616 |