Name:

Nicole Broz

Group:

1A-2

Basic Science Question:

What are inlays and onlays?

Report:

When developing a conservative, yet thorough treatment plan for a patient, dentists must evaluate many factors to choose the best possible restoration. Some factors include the anatomy and structure of the tooth in question, the extent of decay, the function of that particular tooth, different restoration materials and their properties, and the longevity of the proposed restorations available. For small or minor lesions, fillings are a direct restoration that are typically recommended as a relatively inexpensive and minimally invasive option for patients. For caries that is more extensive where the tooth structure is more compromised, an indirect restoration is often used as a treatment option. Indirect restorations are made outside of the mouth, typically via CAD/CAM software, and then bonded to the tooth structure inside the mouth (Angeletaki *et al.,* 2016). Some examples of indirect restorations include inlays, onlays and crowns.

When caries on the occlusal surfaces of posterior teeth extends in a way that the isthmus of the preparation is too wide for filling preparation and restorative materials, an indirect inlay restoration is often chosen as a treatment option (Hopp & Land, 2013). If the caries extends even further and involves at least one cusp of the tooth, typically a restoration called an onlay is used. Onlay preparation includes the removal of carious lesion and the compromised cusp(s) that have been affected, while conserving as much viable tooth structure as possible. By preserving as much healthy tooth structure as possible, the amount of restorative material is minimized and has more underlying support (Hopp & Land, 2013). Contrastingly, traditional crown preparation completely removes all cusps of the tooth for a cap-like restoration to sit on top of a post-like preparation. Crowns are often recommended for more extensive decay that an inlay or onlay may not completely treat. Dentists must evaluate the overall health of the tooth and extent of decay using radiographs, and visual and tactile examination to best determine which option will work best for the tooth in question.

Inlays and onlays, like crowns, can be fabricated from many different materials. In the past, inlays and onlays were often composed of gold or other dark metals because the aforementioned materials provide strength and durability during mastication (Hopp & Land, 2013). Throughout the years, newer materials have been developed that offer a more aesthetic alternative for patients when choosing a restoration option. Ceramic inlays and onlays are often offered as a strong, yet aesthetic treatment option for patients who would prefer a tooth-colored restoration. An advantage to using ceramic inlays and onlays includes the bonding systems available to adhere the restoration to the tooth. There are many bonding systems on the market, but most aim to allow for adhesion of the restoration to the underlying enamel and dentin (Hopp & Land, 2013). The combination of aesthetic appeal and strength to occlusal forces, all while maintaining as much healthy underlying tooth structure

as possible makes inlays and onlays a great option for patients.

References:

Angeletaki, F., *et. al.* (2016). Direct versus indirect inlay/onlay composite restorations in posterior teeth. A systematic review and meta-analysis. *Journal of Dentistry, 53, 12-21.* https://doi.org/10.1016/j.jdent.2016.07.011

Hopp, C. D., & Land, M. F. (2013). Considerations for ceramic inlays in posterior teeth: A review. *Clinical, Cosmetic and Investigational Dentistry*, *5*, 21–32. https://doi.org/10.2147/CCIDE.S42016