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Basic Science Question:

What causes tooth wear?

Report:

To start, tooth wear, or also known as tooth surface loss, is a common irreversible dental problem. It is defined as destruction of hard dental tissue not caused by carious lesions. There are many types of wear with the most prevalent being attrition, abrasion, abfraction, and erosion. Each type of wear has different mechanisms as to how they develop and how they affect tooth structure and aesthetic. Each patient is affected differently, however, there are similarities within each type.

Looking at attrition, it is caused by direct tooth to tooth contact leading to tooth tissue loss. The effects of attrition can be increased by lack of posterior tooth support because it causes more prevalent contact points on the rest of the teeth. Attrition is seen as shiny facets, a flat area, on the occlusal or incisal surfaces of teeth.

Abrasion is caused by external objects instead of intraoral contact points as with attrition. It is commonly due to too hard of toothbrush bristles, coarse toothpaste, or forceful brushing by an individual. It also can be caused by tough foods or the excessive use of toothpicks. A defining characteristic of abrasion is that there is no hypersensitivity and it typically forms in a V shape along the gumline or along the tooth edges.

For abfraction, it is thought of as wear of tooth structure on locations of the tooth surfaces other than direct contact points and many times is attributed to abrasion. However, the true causes are not well known and up for debate in the dental community. Abfraction lesions present many times as V-shaped damage or more rounded and C shaped. It also has the distinguishing feature of occurring subgingivally which would not be present with abrasion.

Erosion is the fourth type of commonly seen tooth wear. It is defined as loss of tooth structure due to non-bacterial acids. The acid can come from the patient's gastrointestinal tract or from outside sources such as food, drink, and medications. Erosion has many sub-factors that vary the degree of severity. The factors include concentration of acid, pH, frequency of exposure, length of exposure, and temperature of the acid substance. The exposure of teeth to acidic material first causes enamel to soften and can proceed apically. Many times, erosion continues to below the surface of a tooth. The softened tissue is then extremely susceptible to damage because of the fragile nature. Once most of the enamel is eroded away, dentin typically erodes at a faster rate. To an extent, saliva acts as protection for the teeth against erosion by acting as a buffering solution in attempts to keep the pH stable, but this is only a minimal protection that does not withstand extreme exposure.

Overall, tooth wear has a variety of causes including attrition, abrasion, abfraction and erosion. These can work independently or potentially together. Tooth wear needs to be monitored and managed on a case to case basis in order to most effectively treat each patient. The cause and severity both play a role in creating a treatment plan that is right for the patient. General knowledge about tooth wear is a necessity in the dental community in order to ensure the best treatment possible.

References:

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