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Group:

8A

Pathology Question:

What is the etiology of incisal chipping, abfraction lesions, chipping porcelain, and incisal wear?

Report:

Incisal Wear:

- Incisal wear is a natural, unavoidable process due to contact with opposing teeth, tooth-to restoration contact, and parafunctional habits like bruxism and clenching. Over long periods of time our teeth will slowly wear each other down especially in those patients that grind and clench their teeth. Extremely hard restoration materials like porcelain can wear down natural teeth even quicker.
- Incisal wear can also be due to a Class III malocclusion and end-to-end contact. Contact with foreign extra-oral objects like food and other habits like chronically holding a pipe in between teeth can cause incisal wear as well.

Incisal Chipping:

- Chipping is often due to more traumatic events and result in more jagged fractures of the teeth. Chipping can be caused by biting into hard substances like ice or candy, or due to trauma from car accidents or falls. Contact sports and bruxism can also lead to chipped teeth. Chipping teeth can also be due to poor decision making, one of the worst being opening beer bottles with your teeth.

Chipping Porcelain:

- According to my source porcelain fracturing has rate of occurrence of 0.9-29.1%. This is a pretty huge range and they found that the lowest chance of fracture is with single unit crowns and the occurrence increased with longer span FPDs. This chipping is often a result of many of the same things as incisal chipping, including traumatic contact, biting hard substances, etc. However, porcelain crowns can become more susceptible to chipping due to the heating and cooling process. The heat capacity of zirconia is 3.5 times that of gold. For this reason, a larger temperature gradient is believed to occur in the process of cooling after firing. This creates a shrinkage difference between the inner and outer surfaces of the sintered body and triggers cracking and other defects. Another factor that causes chipping is non-uniform thickness. A design with excessively thick or thin porcelain can lead to weakened porcelain, spontaneous cracking increases under conditions of firing with a higher cooling rate in a thcker layer of porcelain.

Abfraction Lesions:

- Abfraction lesions are usually located in the cervical region of the tooth, and are typically listed with abrasion due to a similar location of the lesions and its contribution to Abfraction. Abrasion lesions are often due to improper, forceful brushing, using hard bristled toothbrushes and abrasive dentifrice with an aggressive horizontal brushing techniques. Abfraction lesions are frequently attributed to be a combination of abrasion

and eccentrically placed occlusal stresses that lead to tooth flexure. The weakening and microfractures of the cervical region of teeth in abfraction lesions due to tensile stresses produce the classical wedge-shaped defects near the CEJ.

References:

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