Tooth wear

A 28-year-old female visits the dental hygiene practice. It's her first visit. She is referred by a dentist, on her own request. She complains about tooth sensitivity.

Medical history

The medical history shows eating disorders in the past. She mentioned specifically that it is not a problem anymore.

Dental history

The patient demonstrates a very good oral hygiene. She is motivated. She is using a power toothbrush, waxed dental floss and fluoridated toothpaste. She claims to be using the dental floss every day. She doesn't smoke and she is compliant to the dental check-ups.

Mouth inspection

There is no visible inflammation of the gums, no pockets deeper than 3 mm and no visible caries lesions. There are few recessions and some dentine seems to be exposed. The radiographs show no caries or periodontal defects.

The patient is worried about the recessions. The tooth sensitivity seems to increase.

Questions

1. What does the term 'tooth wear' mean?

Tooth wear is a term to cover non-carious tooth surface loss by attrition, abrasion and erosion (1, 2). Distinguished are: attrition (normal physiological wear of teeth and mastication, the wear of tooth against tooth), abrasion (the pathological wear of teeth from a mechanical/rubbing process, wear of teeth from other factors) and erosion (the pathological wear of teeth from a chemical dissolving process, dissolution of teeth by acids).

Abrasion and attrition are sources of physical wear and are commonly associated with tooth brushing and tooth-to-tooth contact. A combination of attrition, abrasion and erosion or exacerbates wear (3). Attrition can be recognized by flattened occlusal surfaces either with or without strong developed masseter muscles (1, 2). Abrasive wear may be seen in a wide range of patients, whereas attritive loss is usually seen in individuals with bruxism (3).

Enamel erosion is characterized by acid-mediated surface softening that, if neglected, can progress to irreversible loss of surface tissue. It could lead to exposure of the underlying dentine (3). Enamel erosion results in the formation of a softened layer that is susceptible to disruption by mechanical factors, such as brushing abrasion, tongue friction and attrition (4). Acids weaken the mineralized tissue and increase the susceptibility of the enamel and dentine to abrasion from tooth brushing. Quite often abrasion and erosion are combined (2).

A combination of erosion and abrasion will probably lead to cupping of the occlusal surfaces. If erosion is considered to be the main factor, the buccal and lingual surfaces appear smooth and shiny (2).

2. Is there a relationship between tooth wear and hypersensitivity?

There is evidence that show a relationship between tooth brushing, with or without toothpaste and an acidic diet, tooth wear and dentine hypersensitivity. Some authors also suggest that dentine hypersensitivity is a tooth wear phenomenon (1). The important role of saliva is described. It confers the major protective function against wear due to its role in pellicle formation, buffering, acid clearance and hard tissue remineralization (3).

Tooth wear processes cause loss of enamel and can expose dentine (1, 3). Therefore, sensitivity may result. It is recommended that these factors are considered in management strategies for the patient suffering from dentine hypersensitivity (1, 5).

Gingival recession most commonly exposes dentine and localizes sites for dentine hypersensitivity. Some toothpaste products can expose dentinal tubules but erosion is probably the more dominant factor in dentine hypersensitivity.

In cases with slower progression, the patient may remain without symptoms even though the whole dentition may become severely damaged (5).

3. Is there a relationship between tooth brushing and tooth wear and how can the progression of the tooth wear in this case be managed?

The patient is using an electric toothbrush. There is no evidence to indicate that electric and manual toothbrushes differ in effects on soft and hard tissues. The toothbrush alone appears to have no effect on enamel and very little on dentine. Most toothpaste also has very little effect on enamel and in normal use would not cause significant wear of dentine in a lifetime of use. Wear of enamel and dentine can be dramatically increased if tooth brushing follows an erosive challenge (4).

This patient might not be aware of the dental erosion as it is a slowly progressing condition. Smooth silky-shiny appearance with the absence and intact enamel along the gingival margin, with cupping and grooving on occlusal surfaces are some typical signs of enamel erosion. In later stages, it is sometimes difficult to distinguish between the influences of erosion, attrition or abrasion during a clinical examination. In this case the tooth wear might be a result of the patients eating disorders in the past (2).

Biological, behavioural and chemical factors all come into play when determining the cause of the tooth wear. The first stage in managing tooth wear is to diagnose the cause and then start a preventive protocol (2).

This patient should record her dietary intake for a distinct period of time. The dental hygienist should mention that the tooth wear might have developed during the period of her eating disorder, as one should avoid implicating existence at present of an eating disorder.

Based on the analyses a tailored preventive programme could be developed for the patient. The content of this advice could be:

- a dietary advice and information about the frequency of intake of dietary acids, and a possible change of habits and lifestyles that predispose teeth to erosion development;
- optimization of fluoride regimes, the frequent use of fluoride gel and fluoride mouth rinse in addition to fluoride toothpaste offers the opportunity to minimize abrasion of tooth substance, protect or restore erosively damaged tooth, and provide mechanical protection against erosive challenge;
- stimulation of salivary flow rate;
- use of buffering medicaments, reduction of the erosive potential of acidic products; particular motivation for non-destructive tooth brushing habits (1, 2, 6, 7).

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