



Introduction

Acid tooth erosion, AKA, dental erosion (DE) is a condition in which the enamel on your teeth is gradually worn away by acids which are introduced into the oral environment¹. These harmful acids can come from certain foods we eat or drink as well as from our own stomach acid in diseases such as gastroesophageal reflux disease (GERD)¹. Over time, this erosion can lead to enamel microfractures, discoloration, sensitivity, and even tooth decay¹. When the acid challenge is coming from a known source, we can identify and remove that etiological factor or mitigate its effects. But what if we can't identify a dietary or intrinsic source of acids? What if these sources of acids are something we cannot even see? Its time to revisit our patient's history and identify potential acidic substances in the workplace or other areas of life that may be leading to dental erosion.

Identifying Dental Erosion

Anterior teeth:

- Increased incisal translucency leading to brown/yellow discoloration and tooth sensitivity
- Palatal erosion (associated with frequent vomiting)
- Incisal chipping and cupping out of incisal edges



Posterior teeth:

- Increased transparency, discoloration, and sensitivity.
- Rounding and cupping of cusp tips
- Severe cases: cupping of occlusal surface and VDO closure



Occupation Acid Tooth Erosion

Exposure to acid fumes from the workplace environment may increase the erosion of teeth³. The most affected area is the facial surface of maxillary anterior teeth which are not continuously protected by the lips and saliva⁴. Below are several professions associated with dental erosion².



HIGHER RISK JOBS



ACID SOURCE (pH)

- Battery manufacturing
- Phosphate industry (fertilizers)
- Mining, refining, wastewater Tx.
- Welding, metal plating

- Sulfuric acid (0.8)
- Phosphoric (1.5), Sulfuric acid (0.8)
- Sulfuric acid (0.8)
- Chromic, Nitric acid (3)

LOWER RISK JOBS



ACID SOURCE (pH)

- Professional swimmers/divers
- Wine Tasters (dietary)

- Pool H₂O (7) Chloroacetic acid (1.5)
- Tartaric, malic acid (2.9 -4.2)

Interventions⁵

Control: Acid challenges in oral environment

- Behavioral changes: modify diet, treat GERD, wear respirators.

Protect: Teeth from acid contact.

- Chew xylitol gum, high fluoride toothpaste, F varnish
- CAMBRA, Salivary pH neutralizing rinses, stay hydrated

Minimize: Frictional forces

- Soft bristle toothbrush, rush before acid challenge
- Treat bruxism, mouthguards/splints, reduce stress



Nothing happens to the teeth until it happens to the **SALIVA FIRST!**

Case

S) 52yo M

CC: "I don't like the gap in my teeth, my mouth is dry, and my teeth are sometimes sensitive and chip. I think I grind at night"

MH: Peripheral neuropathy

Meds: None

SH: Welder, reports infrequent use of respirator at work, balanced diet

O) Enamel fractures #6, #7, #10, #11, #20, Md molars B cusp tip pitting
generalized discoloration of occlusal and incisal surfaces

Cupping of md incisal edges

A) Pt suffers from occupational acid erosion⁶

P) Prevention: Hydrate, xylitol gum at work, wear respirator, night guard

Disease Control: Composite repair fractured teeth⁵

Reconstructive: 6-unit Zirconia bridge #22-#27⁷

Maintenance: Boost Spray, frequent recalls



Challenges

A main challenge in this case was identifying the etiology of the patient's acid erosive tooth wear. With no obvious dietary clues or acid reflux disease, discovering the source of acid was not easy. Thorough history taking and discussion of lifestyle habits were key in identifying chromic acid used in welding shops as the main etiologic factor in his dental erosion.

Following the "control, protect, minimize" intervention plan will be difficult as it will require significant lifestyle and workplace changes that the patient may not be used to.

Conclusion

If left untreated, dental erosion can lead to progressive loss of enamel from the surfaces of teeth and in severe cases cause VDO closure and tooth loss. When facing cases of acid erosion, it is crucial to intervene early and identify the source of acid. This means taking thorough histories of patients and recognizing hallmark signs of acid erosion. Removing or minimizing the etiologic factors, alongside protecting the teeth and minimizing frictional forces can help prevent further erosion.

Nothing happens to the teeth until it happens to the saliva first. Controlling salivary flow and pH is key in treating dental erosion as saliva plays an important role as a buffer neutralizing acids in the mouth. High salivary flow helps clear acids from the oral environment and provides minerals that strengthen enamel.



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