

## Case Report

### Abrasion of Teeth (Tooth Wear)

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#### Abstract:

Scientific studies and researches are globally being done for the prevention of dental caries which is a common chronic diseases. Although there are studies for the prevention of dental caries. Today the development of the food sector and the increase in chemical content, intensity of work-life and consequently increasing stress, newly developed toothbrushes and their misuse result in dental caries on dental hard tissues. Tooth abrasion and erosion on the surface of the teeth leave the theeth unprotected and increases the formation of cavities. In this study the causes of the erosion, its index and treatment protocols will be described with clinical cases.

Key words: Abrasion, Servical Lesions, TWI Index

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#### Introduction

Abrasion can be defined as corrosion in the tooth tissue or structure resulting from contact of a foreign body.<sup>1</sup> Dental abrasion may vary depending on some habits and the occupational features.<sup>2</sup> Those who cracks nuts with their teeth, those who have nail-biting habbits, carpenters, tailors and musicians have abrasions on incisal teeth parts due to their occupational features.<sup>3</sup>

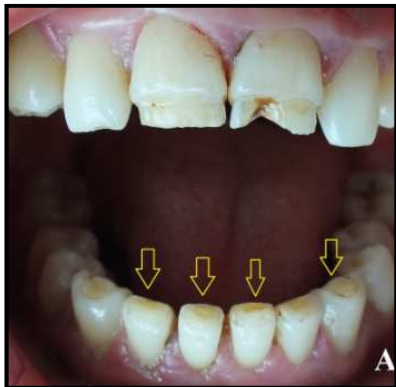
Erosion is a process of destruction seen in dental hard tissue as a result of chemical reactions. This process doesn't include any bacteriological event.<sup>4</sup> If the mouth pH drop below to 5.5 which is the critical value of tooth enamel, erosion occurs depending on the duration of acid attack.<sup>5</sup>

#### Case Report

In this study, 59-year-old and 32-year-old male patients were admitted to our clinic on the grounds that the abrasion on the teeth. After taking the history from 32 year old patient, it was determined that he did not have any systemic disorders and did not use a drug regularly.

With a score of 4 was evaluated by TWI index and the pulp is released at the location indicated by the red arrow. It was determined that this patient brushed his teeth in a wrong way and he used chemical agents for bleaching his teeth. Also as a result of bruxism, attrition was found on the teeth of the patient. As a result, depending on the patient incorrect tooth brushing, abrasion was diagnosed in Maxillar anterior teeth and on the other

hand, erosion was determined incisal and occlusal surfaces of the mandibular teeth. [Figure 1(A-B)]



**Figure 1 (A):** Incisal attrition of mandibular teeth are shown in yellow arrow



**Figure 1 (B):** Palatal view of the patient's teeth



**Figure 1 (C):** After treatment



**Figure 1 (D):** Erosion is observed in the patient's teeth.

While, on the labial surface of the teeth , the score was detected as 2, on palatal surfaces it was detected as 1.

After the history taken from 59-year-old patient, patient was found to have Regürtitasion. Approximately 15 years, this disease has been determined to exist. Especially erosion was determined on maxillary incisors, lateral, canine and premolar teeth of the patient. In the maxillary right upper central teeth, pulp exposure was observed. (Figure 1 D) Viability test was performed on teeth and has been found to be vital. According to the TWI index, score was determined as 4 in the labial surfaces of the teeth. In this patient rather than on incisal surface, lesions were mostly determined in the cervical region.

In treatment planning of dental erosion, the clinical appearance of the lesions, the patient's complaints and the economic situation were taken into consideration. Although there is no wear of the teeth in the cervical region, sensitivity complaint is available in 32-year-old patient. Because dentinal tubules are exposed, the patient's teeth were restored with composite resin to resolve this sensitivity in patients and to provide aesthetic restorations. After the assessment of 59 year-old patient's expectations, considering the economic conditions as well, direct composite veneer restoration which is minimally invasive and can meet the aesthetic expectations of the patient was agreed to be applied. After treatment, the patient didn't come to his controls. Materials used during treatment is shown in table 1. In restoration of non-cariou cervical lesions, using a material having a low modulus of elasticity is preferred due to its flexibility against the stres occurring on teeth.<sup>20-22</sup> Therefore flowable composites with low elasticity modulus is manufactured. These materials can absorb stresses generated during the shrinkage of polymerization.<sup>23</sup> Laminate veneer applications can be evaluated as a treatment option in very advanced lesions

by taking economic status of patients into consideration.

**Discussion**

The causes of erosion can be examined in three parts as internal factors, external factors and predisposing factors.<sup>4</sup>

**Internal Factors**

- Gastric acid into the oral cavity owing to disorders like vomiting, reflux, anorexia, bulimia nervosa.<sup>6-8</sup>
- Regürtitasion, namely the frequently filling of the gastric acid into the mouth.<sup>9</sup> After nausea and vomiting in pregnant women, the acid causes abrasion on the teeth.

Acidic foods in the diet (acidic herbal teas, vinegar products, acidic drinks) largely causes abrasion.<sup>10</sup> Drugs and oral hygiene products may lead to erosion, as well.<sup>11</sup> Hydrochloric acid which is used for the treatment of patients can cause severe erosion. Chewable tablets also causes erosion.<sup>12</sup> Acetyl salicylic acid which is used to treat children with juvenile rheumatoid arthritis was found to cause erosion in the teeth of patients using chewable tablets.<sup>13</sup> People’s daily habits can also cause extreme erosion in teeth. The presence of acidic drinks, carbonated food and fruit juices in the diets of some people often increases this risk.

**Table 1:** Materials used treatment

Materials	Producer Firm	The Purpose Of Use
Transparent Matrix Band	Kerr Hawe Stopstrip,China	Proximal Adaptation
Kama	Fixing Wooden Wedges,E.U	Excellent Filling Without Overflow
The Phosphoric Acid Gel of %37	Etching Gel, Kerr, USA	Roughen the Surface of the Enamel
Bonding ajan	Clearfil SE bond, Kuraray, Japan	Increase Retention
Composite Resin	Voco Amaris Resin, Germany	More Resistant Aesthetic Restoration
The Finishing Discs	3M ESPE Sof-Lex,U.S.A	Smooth Surface
The Finishing Fresis (ankansas)	FG Diamond Bur Composite Finishing Kit	Smooth Surface Form

**Table 2.** TWI index for determining the tooth surface loss.

Score	Surface	Criteria
0	B/L/O/I C	No loss of enamel, No changes in tooth contour
1	B/L/O/I C	Mine got lost on the surface There is minimal loss of tooth contour
2	B/L/O I C	Dentin loss in the surface Surface 1/3 loss of less than
3	B/L/O I C	Dentin surface 1/3 to have excess losses. Loss-not consist of pulp
4	B/L/O I C	Complete loss of enamel Contain pulp or secondary dentin The defect depth is 2 mm or more;

teeth after every meal causes the abrasion of enamel surface of the teeth. The teeth should be brushed at least half an hour following the exposure to acidic foodstuffs. Otherwise, it causes destruction on the surface of enamel and dentin of the teeth.<sup>14-16</sup>

### **Predisposing Factors**

The most important predisposing factor has been reported as the buffering capacity of saliva. Saliva acts as buffer by neutralizing acids in a diet.<sup>14,17</sup> When the buffering capacity of saliva decreases, erosion can increase. Soft tissue anatomy and soft tissue moves provide the contact of acidic deposit with the tooth surfaces and directs its the effect. This incident on the surface of the teeth is directly related to material loss.<sup>14</sup> The anatomy, occlusion, contours of the teeth and their locations in mouth is directly related to swallowing. Also, occlusion, in erosion etiology, is related to the theory of flexion which is particularly among caries-free cervical lesions.<sup>18</sup>

### **Erosion Evaluation Index**

The most commonly used index to score dental erosion is the TWI dental erosion index that was created by Smith and Knight.<sup>19</sup> TWI index is an epidemiological index for determining the tooth surface loss (Table 2). The decision to restore a cervical lesion should be based on etiology, patient's requests and size of the defect. Many methods are used in the treatment of cervical lesions. For examples; change of dietary, topical fluoride therapy, glass ionomers and compomers resin composites or porcelain veneers crown.

### **Conclusion**

In restoration of tooth abrasion, different materials and techniques are used. With the restoration, the aesthetics and function of the tooth is purposed to regain, and is intended to increase durability of teeth and to eliminate sensitivity and stress in the cervical region. Due to having different color options and the ability for bonding

with adhesive resins, composite resins are widely used in the restoration of wear lesions.

### **References**

1. Watson IB, Tulloch EN. Clinical assessment of cases of tooth surface loss. *Br. Dent. J.* 1985;159:144-148.
2. Bishop K, Kelleher M, Briggs P, Joshi R. Wear now? An update on the etiology of tooth wear. *Quintessence Int.* 1997;28: 305-313.
3. Hattab FN, Yassin OM. Etiology and diagnosis of tooth wear: A literature review and presentation of selected cases. *Int. J. Prosthet.* 2000;13:101-107.
4. O'Sullivan E, Milosevic A. UK National Clinical Guidelines in Paediatric Dentistry: diagnosis, prevention and management of dental erosion. *Int J Paediatr Dent* 18 Suppl 2008; 1: 29-38.
5. Litonjua LA, Andreana S, Bush PJ, Cohen RE. Tooth wear: Attrition, erosion and abrasion. *Quintessence Int.* 2003;34:435-446.
6. GilmourAG, Beckett HA. The voluntary reflux phenomenon. *Br Dent J* 1993; 175: 368-372.
7. O'Sullivan EA, Curzon ME, Roberts GJ, Milla PJ, Stringer MD. Gastroesophageal reflux in children and its relationship to erosion of primary and permanent teeth. *Eur J Oral Sci* 1998; 106: 765-769.
8. ReyesAL, CashAJ, Green SH, Booth IW. Gastroesophageal reflux in children with cerebral palsy. *Child Care Health Dev* 1993; 19: 109-118.
9. Scheutzel P. Etiology of dental erosion-Intrinsic factors. *Eur. J. Oral Sci.* 1996;104: 178-190.
10. Asher C, Read MJ. Early enamel erosion in children associated with the excessive consumption of citric acid. *Br Dent J* 1987; 162: 384-387.
11. ValinotiAC, Da Silva Pierro VS, Da Silva EM, Maia LC. In vitro alterations in dental enamel exposed to acidic

- medicines. *Int J Paediatr Dent* 2011; 21: 141-150.
12. Zero DT. Etiology of dental erosion—extrinsic factors. *Eur J Oral Sci* 1996; 104: 162-177.
  13. Sullivan RE, Kramer WS. Iatrogenic erosion of teeth. *ASDC J Dent Child* 1983; 50: 192-196.
  14. Moss SJ. Dental erosion. *Int Dent J* 1998; 48: 529-539.
  15. Williams D, Croucher R, Marcenes W, O'Farrell M. The prevalence of dental erosion in the maxillary incisors of 14-year-old schoolchildren living in Tower Hamlets and Hackney, London, UK. *Int Dent J* 1999; 49: 211-216.
  16. Zero DT. Etiology of dental erosion—extrinsic factors. *Eur J Oral Sci* 1996; 104: 162-177.
  17. Scheutzel P. Etiology of dental erosion—intrinsic factors. *Eur J Oral Sci* 1996; 104: 178-190.
  18. Khan F, Young WG, Shahabi S, Daley TJ. Dental cervical lesions associated with occlusal erosion and attrition. *Aust Dent J* 1999; 44: 176-186.
  19. Smith BG, Knight JK. An index for measuring the wear of teeth. *Br Dent J* 1984; 156: 435-438.
  20. Smith BGN, Bartlett DW, Robb ND. The prevalence, etiology and management of toothwear in the United Kingdom. *J. Prost. Dent.* 1997;78:367-372.
  21. Condon JR, Ferracane JL. Assessing the effect of composite formulation on polymerization stress. *J. Am. Dent. Assoc.* 2000;131(4):497-503.
  22. Lee WC, Eakle WS. Possible role of tensile stress in the etiology of cervical erosive lesions of teeth. *J. Prosthet. Dent.* 1984;52(3):374-380.
  23. Bayne SC, Thompson JY, Swift EJ, Stamatiades P, Wilkerson M. A characterization of first-generation flowable composites. *J. Am. Dent. Assoc.* 1998;129:567- 577.

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