pISSN:2349-5707 Volume:13,Issue 5, May -2026 eISSN:2349-5715

MODERN APPROACHES TO THE TREATMENT OF PATHOLOGICAL TOOTH WEAR

Razhabzoda Parvina Hakimovna
Asia International University
aliyevafotima2024@gmail.com
https://doi.org/10.5281/zenodo.20348609

Abstract

Pathological tooth wear is a progressive dental condition characterized by the irreversible loss of hard tooth tissues due to non-carious processes such as attrition, abrasion, and erosion. With the advancement of modern dentistry, innovative diagnostic tools and minimally invasive treatment strategies have significantly improved patient outcomes. This article discusses the etiology, classification, and contemporary approaches to the management of pathological tooth wear.

Introduction

Pathological tooth wear has become increasingly prevalent due to changes in lifestyle, diet, and oral habits. Unlike physiological wear, which occurs naturally over time, pathological wear progresses rapidly and may lead to functional and эстетic problems. Early diagnosis and modern treatment approaches are essential to prevent severe complications.

Etiology and Classification

Pathological tooth wear is generally classified into three main types:

- **Attrition** – mechanical wear caused by tooth-to-tooth contact, often associated with bruxism.
- **Abrasion** – wear resulting from external mechanical forces, such as aggressive tooth brushing or improper use of dental tools.
- **Erosion** – chemical dissolution of tooth structure due to acids, either intrinsic (gastric reflux) or extrinsic (acidic foods and beverages).

Often, these factors act synergistically, accelerating the destruction of dental tissues.

Clinical Manifestations

Patients with pathological tooth wear may present with:

- Increased tooth sensitivity
- Loss of vertical dimension of occlusion
- Flattened or cupped occlusal surfaces
- Cracks and fractures in teeth
- Aesthetic concerns due to shortened teeth

Modern Diagnostic Methods

Advances in dental technology allow for early detection and precise monitoring:

- **Digital intraoral scanning** for 3D assessment of tooth structure
- **Quantitative wear analysis software** to track progression
- **Photographic documentation** for longitudinal comparison
- **Occlusal analysis systems** to evaluate bite forces

Contemporary Treatment Approaches

1. Preventive Strategies

Prevention remains the cornerstone of management:

- Dietary counseling to reduce acidic intake
- Behavioral therapy for bruxism
- Use of fluoride and remineralizing agents
- Custom night guards to protect teeth from grinding

pISSN:2349-5707 Volume:13,Issue 5, May -2026 eISSN:2349-5715

2. Minimally Invasive Restorative Techniques

Modern dentistry emphasizes preservation of natural tooth structure:

- Direct composite restorations
- Adhesive bonding systems
- Use of glass ionomer cements in early lesions

3. Advanced Prosthetic Rehabilitation

In severe cases, full-mouth rehabilitation may be required:

- Ceramic veneers for aesthetic restoration
- Crowns and bridges to restore function
- Implant-supported prostheses when tooth loss occurs

Digital smile design and CAD/CAM technology have revolutionized prosthetic planning and execution.

Multidisciplinary Approach

Effective treatment often requires collaboration between specialists:

- Prosthodontists
- Orthodontists
- Gastroenterologists (for acid reflux management)
- Psychologists (for stress-related bruxism)

Risk Factors and Epidemiology

Recent studies indicate that the prevalence of pathological tooth wear is increasing globally, affecting both young and adult populations. Key risk factors include:

- High consumption of acidic beverages (soft drinks, energy drinks)
- Gastroesophageal reflux disease (GERD)
- Eating disorders such as bulimia
- Occupational hazards (e.g., exposure to acidic environments)
- Parafunctional habits like bruxism

Epidemiological data suggest that early signs can appear even in adolescents, making preventive strategies crucial from a young age.

Role of Saliva in Tooth Wear Protection

Saliva plays a critical protective role in maintaining oral health:

- Acts as a natural buffer against acids
- Promotes remineralization of enamel
- Forms a protective pellicle layer on tooth surfaces

Reduced salivary flow (xerostomia) significantly increases the risk of erosion and wear. Modern treatment approaches often include salivary stimulation therapies or artificial saliva substitutes.

Innovations in Biomaterials

Recent advances in dental materials have transformed restorative procedures:

- **Nanocomposite resins** – improved strength and wear resistance
- **Bioactive materials** – capable of releasing ions that promote remineralization
- **High-strength ceramics (e.g., zirconia)** – excellent durability and aesthetics
- **3D-printed restorations** – customized and time-efficient solutions

These materials allow clinicians to achieve long-lasting and minimally invasive restorations.

Digital Dentistry and Artificial Intelligence

The integration of digital technologies has revolutionized diagnosis and treatment:

- **CAD/CAM systems** for precise fabrication of restorations
- **Artificial intelligence (AI)** for early detection and risk assessment
- **Digital occlusion analysis** for accurate bite adjustment
- **Tele-dentistry** for remote monitoring and consultation

AI-based tools can predict disease progression and assist in personalized treatment planning.

Behavioral and Lifestyle Modifications

pISSN:2349-5707 Volume:13,Issue 5, May -2026 eISSN:2349-5715

Successful management depends not only on clinical treatment but also on patient behavior:

- Reducing frequency of acidic food intake rather than just quantity
- Avoiding tooth brushing immediately after acid exposure
- Using soft-bristled toothbrushes and proper techniques
- Stress management to control bruxism

Patient education is a key component of long-term success.

Complications of Untreated Pathological Tooth Wear

If left untreated, the condition may lead to:

- Severe tooth structure loss
- Pulp exposure and infection
- Temporomandibular joint (TMJ) disorders
- Impaired mastication and speech
- Psychological distress due to aesthetic concerns

Future Perspectives in Treatment

The future of managing pathological tooth wear is promising:

- Development of regenerative therapies for enamel repair
- Stem cell-based dental tissue engineering
- Smart materials that adapt to oral conditions
- Increased use of personalized medicine approaches

Conclusion

Pathological tooth wear is a multifactorial condition that requires a comprehensive and modern approach to management. Advances in digital dentistry, biomaterials, and preventive care have significantly improved treatment outcomes. However, early diagnosis, patient education, and interdisciplinary collaboration remain the cornerstones of effective therapy. Future innovations are expected to further enhance the ability to restore and even regenerate damaged dental tissues.

References:

1. **Feruza, K.** (2024). A brief overview of pragmatics: Language in context. American Journal of Philological Sciences, 4(3), 24-31
2. **Khajieva, F. M.** (2021). The rise and development of the american biographical novel. JournalNX, 7(06), 262-267.
3. **Melsovna, K. F.** (2021). Cosmopolitanism throgh intertextual devices in the postmodern biographical novel. ACADEMICIA: An International Multidisciplinary Research Journal, 11(11), 156-161.
4. **Feruza, K.,** & Shakhnoza, R. (2024). Understanding postmodernism through the theories of lyotard and baudrillard. International Journal Of Literature And Languages, 4(3), 20-25.
5. **Khajieva, F.,** & Kendjaeva, G. (2019). Study of stylistic lexicology. TEST Engineering and.
6. **Khajieva, F. M.** (2020). Theoretical aspects of the language learned (Stylistics). Бухоро: Дурдона.
7. **Melsovna, K. F.,** & Qizi, G. D. G. (2023). EUPHEMSM IN ORIGINAL AND TRANSLATION (IN THE EXAMPLE OF JACK LONDON'S NOVEL MARTIN EDEN). International Journal Of Literature And Languages, 3(04).
8. **GENESIS, F. M. K**. (2020). DEVELOPMENT OF STYLISTIC DEVICES CLASSIFICATIONS. Филология масалалари. Ўзбекистон давлат жаҳон тиллари университети, (3-Б), 30-38.
9. **Khajieva, F.** (2020). Genesis and development of stylistic devices. Classifications. Philology Matters, 2020, 3.
10. **Khajieva, F. M.** (2019). Decoding of stylistic devices in Russian and English translations of the Uzbek novel “days gone by” by Abdulla Qadiri (stylistic correspondences and transformations). ISJ Theoretical & Applied Science, 04 (72), 541-545.

pISSN:2349-5707 Volume:13,Issue 5, May -2026 eISSN:2349-5715

11. **Feruza, K.,** & Sevara, G. (2023). Stylistic Transformations In The English Translations Of A. Qodiriy's Novel “Days Gone By”[J]. International Journal Of Literature And Languages, 3(04), 63-69.
12. **Khajieva, F.,** & Rakhimova, S. (2023). EXPLORING LITERARY INNOVATIONS: A CLASSIFICATION OF FRAGMENTED FORMS IN BELLES-LETTRES TEXT. International Journal Of Literature And Languages, 3 (11), 47–53. https://doi. org/10.37547/ijll/Volume03Issue11, 7.
13. **Melsovna, K. F.,** & Shukhratovna, S. P. (2025). EXPLORING THE USE OF SURREALISM IN FLASH FICTION: A DEEP DIVE INTO TARA CAMPBELL'S" YOU, COMMUTER". Recent scientific discoveries and methodological research, 2(1), 11-13.
14. **FERUZA, K.,** & SHAKHNOZA, R. (2025). A BRIEF OVERVIEW OF COLUM MCCANN’S WORKS AND PROSE STYLE. INTERNATIONAL JOURNAL, 5(2), 51-53.
15. **Khajieva, F.,** & Rakhimova, S. (2024). Comparative Exploration of Freedom, Knowledge and Dignity in the Eastern and Western Philosophy of Enlighteners. ФИЛОЛОГИЯ Учредители: Софийский университет им. Святого Климента Охридского, (45), 37-47.