

Periodontal and Oral Status of Patients with Celiac Disease: A Case Report

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1. Abstract

Celiac disease (CD) is a chronic autoimmune disorder triggered by gluten consumption, leading to small intestinal damage. The immune response often involves IgA antibody production, which can accumulate in gingival tissues. Periodontitis, a complex interplay of plaque and host immune inflammation shares similarities with CD's inflammatory nature. This case report aims to explore the potential association between celiac disease and periodontitis by examining the periodontal status of a 34-year-old male patient presenting with gingival inflammation, dental caries, tooth sensitivity, and a diagnosed history of celiac disease. By comprehensively analyzing patient characteristics, diagnostic findings, clinical manifestations, disease progression, and treatment response, this study contributes to understanding the oral health implications of celiac disease.

2. Introduction

Celiac disease (CD) is a chronic autoimmune disorder triggered by gluten consumption, leading to small intestinal damage. This malabsorption condition affects approximately 0.5-1% of the population [1] but remains often undiagnosed, particularly in adults. Beyond gastrointestinal symptoms, CD presents a diverse range of extraintestinal manifestations, including oral lesions [2]. Left untreated, CD can increase the risk of developing other autoimmune diseases, osteoporosis, infertility, and certain cancers [3]. Periodontitis, a prevalent inflammatory disease affecting the supporting tissues of teeth, is characterized by gingival inflammation, alveolar bone loss, and potential tooth loss. This condition significantly impacts quality of life, contributes to systemic health issues, and imposes a considerable economic burden [4]. Both CD and periodontitis share a common inflammatory basis, suggesting a potential link between these two conditions. Dysbiosis, an imbalance in the gut and oral microbiome, is frequently observed in both diseases and other inflammatory conditions [5-8]. Highlighting the complex interplay between the immune system, microbiota, and overall health.

3. Case Presentation

3.1. Patient Information

A 34-year-old male presented to the Department of Periodontology at the College of Dentistry, Sana'a University, Yemen, with chief complaints of gingival inflammation, dental caries, tooth sensitivity, and brittleness.

Medical History

The patient had a history of celiac disease diagnosed several years prior. Initial symptoms included:

- General weakness and fatigue
- Arthritis in knees and shoulders
- Stiffness and difficulty with mobility
- Weight loss (from 65 kg to 58 kg)
- Vitamin B12 and D deficiency, hypocalcemia
- Onset of gingival inflammation, dental caries, and tooth sensitivity

To manage celiac disease, the patient adhered to a strict diet excluding gluten-containing grains. He experienced severe exacerbations of celiac disease symptoms when unintentionally exposed to gluten or when consuming unwashed qat (khat) containing insecticides.

The patient's medical history was otherwise unremarkable, with no reported hospitalizations or chronic conditions.

Medications

To manage celiac disease exacerbations and associated symptoms, the patient self-medicated with the following:

- Antinal
- Bio Kult
- Flagyl
- Gaviscon
- Nexium
- Paracetamol
- Ringer's solution
- Vitamin D, calcium, and B12 supplements
- Oral Hygiene Practices

The patient reported practicing daily oral hygiene using a soft-bristled toothbrush, toothpaste, mouthwash, dental floss, and a tongue scraper. He employed a vertical brushing technique for anterior teeth and a horizontal scrub technique for posterior teeth.

Oral Examination

Clinical examination revealed generalized gingivitis and localized periodontitis (stage I, grade A) in both dental arches (Figures 1 and 2).

4. Discussion

Celiac disease (CD), a chronic autoimmune disorder triggered by gluten consumption, has been increasingly linked to various systemic diseases, including periodontal disease. This association is attributed to shared genetic factors, bone health implications, and overlapping inflammatory pathways. Despite the growing body of evidence, the prevalence and clinical manifestations of CD in Yemen remain understudied.

5. Prevalence and Clinical Manifestations

The prevalence of CD in Yemen appears to be higher than in many other regions, as [9] reported. The disease often presents with gastrointestinal symptoms but also exhibits extraintestinal manifestations, such as oral lesions. Studies by [10-14], have highlighted the oral health implications of CD, including periodontal disease, gingivitis, and other oral mucosal disorders.

6. Pathogenesis and Shared Risk Factors

Both CD and periodontitis are complex diseases influenced by genetic susceptibility, immune dysregulation, and microbial imbalances. The shared pathogenic mechanisms involve inflammatory responses, dysbiosis, and the role of specific genes, such as HLA-DQ2 and HLA-DQ8. Additionally, the bidirectional relationship between periodontitis and inflammatory bowel disease (IBD), a condition often associated with CD, suggests overlapping etiological factors.

7. Bone Health and Periodontal Disease

Individuals with CD are at increased risk of bone loss, a condition that can exacerbate periodontal disease. The combination of reduced bone mineral density and periodontal inflammation creates a synergistic environment for tooth loss. While the exact relationship between CD and specific periodontal conditions, like ANUG, remains unclear, it is evident that oral health should be a priority for CD patients.

8. Immune Response and Gluten Exposure

The autoimmune nature of CD involves a persistent immune response to gluten-derived peptides. Emerging evidence suggests that similar immune mechanisms may contribute to oral inflammation. The interplay between genetic predisposition, gut microbiota, and environmental factors shapes the individual response to gluten and its impact on both intestinal and oral tissues.

9. Microbiota and Disease Progression

The oral microbiome plays a crucial role in oral health, and its composition can be influenced by systemic conditions like CD. Dysbiosis, or an imbalance in the oral microbiota, has been implicated in the pathogenesis of periodontal disease. Understanding the interactions between gut and oral microbiota may provide insights into the development and progression of both diseases.

10. Conclusion

The association between CD and periodontal disease is complex and multifactorial. While further research is needed to elucidate the exact mechanisms underlying this relationship, the available evidence underscores the importance of comprehensive oral health care for CD



Figure 1: Intraoral Picture.



Figure2: Panoramic X-ray.

patients. Early diagnosis, gluten-free diet adherence, and periodontal maintenance are essential for managing both conditions effectively. Future studies should focus on identifying biomarkers for early detection, developing targeted therapeutic interventions, and improving patient outcomes.

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