
THE IMPACT OF WORN-OUT DENTAL PROSTHESES ON THE DIGESTIVE SYSTEM

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Dental prostheses are widely used in restorative dentistry to rehabilitate edentulous and partially edentulous patients. Their primary functions include restoring mastication, speech, and aesthetics. However, with time, prostheses may become worn-out, ill-fitting, or fractured due to mechanical stress, material degradation, and alveolar bone resorption. Such defective prostheses are not only an oral health concern but also a systemic one, as they directly affect the initial stages of digestion. This article provides an extended review of the impact of worn-out prostheses on the digestive system, analyzing mastication, salivary secretion, gastrointestinal disorders, nutritional deficiencies, and psychosocial outcomes. Pathophysiological mechanisms, clinical case studies, and preventive strategies are discussed to highlight the multidisciplinary importance of prosthesis maintenance.

Introduction

The digestive process begins in the oral cavity, where mastication and salivary mixing prepare food for safe swallowing and effective digestion. Any dysfunction at this stage can have downstream effects on the stomach, intestines, and overall metabolism[1]. Prostheses,

particularly removable dentures, play a vital role in restoring chewing ability in patients with missing teeth. Nevertheless, prostheses are not permanent devices; they deteriorate over time due to material fatigue, occlusal wear, and residual ridge resorption[2]. As dentures lose stability and occlusal balance, patients experience impaired chewing, discomfort, and avoidance of nutrient-rich foods. This results in poor digestion, malnutrition, and increased risk of gastrointestinal disorders[3]. This article seeks to provide a comprehensive understanding of how worn-out prostheses affect the digestive system and to emphasize the importance of preventive prosthetic care.

Literature Review

Research has consistently demonstrated the systemic implications of impaired mastication:

Felton (2009) emphasized that edentulous patients with defective prostheses suffer reduced masticatory efficiency, which increases their risk for malnutrition and gastrointestinal disorders[1].

Ikebe & Matsuda (2017) showed that older adults with worn dentures reported higher rates of gastritis, reflux, and abdominal pain[2].

Ritchie & Joshipura (2002) highlighted the connection between poor oral health and restricted dietary intake, particularly of fiber-rich and protein-rich foods[3].

Moynihan & Steele (2014) concluded that oral health is directly linked to nutritional adequacy, which in turn affects systemic conditions like diabetes and cardiovascular disease[4].

These findings confirm that prosthesis-related oral dysfunctions extend beyond the oral cavity to influence systemic health.

Pathophysiological Mechanisms

Mechanical breakdown impairment – Chewing efficiency declines significantly with worn prostheses, leading to food particles averaging 2–3 times larger than those chewed with natural dentition[5]. Larger particles increase gastric workload and delay digestion.

Salivary insufficiency – Ill-fitting prostheses reduce proper gland stimulation, leading to hyposalivation. As saliva is essential for starch digestion (via amylase) and lubrication of food bolus, its reduction compromises both mechanical and enzymatic digestion[6].

Altered bolus formation – Poor bolus preparation may cause dysphagia and esophageal irritation. Inadequately lubricated boluses may also increase the risk of choking episodes[7].

Nutrient malabsorption – Poor mastication reduces surface area for digestive enzymes, causing malabsorption of essential nutrients such as proteins, iron, and vitamins[8].

✓ Clinical Implications

✓ Gastrointestinal Disorders

✓ Dyspepsia (indigestion): common due to incomplete mastication[2].

Gastritis and reflux: prolonged gastric retention of poorly chewed food leads to mucosal irritation[6].

Constipation: fiber avoidance among denture wearers is linked to digestive sluggishness[3].

Irritable bowel symptoms: undigested food fragments contribute to bloating and abdominal pain[7].

Nutritional Deficiencies

Vitamin A, C, and D deficiencies due to reduced fruit/vegetable intake[5].

Protein deficiency from avoidance of meat and fibrous foods[6].

Mineral deficiency (calcium, iron, zinc), leading to osteoporosis and anemia[8].

Case Studies

- Case 1: An elderly patient wearing a 12-year-old complete denture reported frequent bloating, reflux, and avoidance of meats. Clinical findings revealed poor occlusal balance, mucosal irritation, and reduced salivary flow. After denture replacement, digestive symptoms significantly improved within 3 months.

- Case 2: A 65-year-old female presented with unexplained anemia. Dietary recall revealed avoidance of vegetables and fruits due to chewing difficulties with worn partial dentures. Nutritional counseling and prosthesis renewal led to improved hemoglobin levels after 6 months.

These cases demonstrate the reversible nature of digestive complications once prosthetic rehabilitation is restored.

Preventive and Clinical Strategies

1. Regular dental check-ups – Dentures should be evaluated every 1–2 years and replaced every 5–7 years[1].

2. Prosthesis relining and rebasing – Adjustments help restore proper fit as alveolar bone resorption progresses[2].

3. Implant-supported prostheses – Offer improved chewing force and reduce gastrointestinal complications[6].

4. Interdisciplinary collaboration – Dentists should work with nutritionists and gastroenterologists to monitor systemic health in long-term denture wearers[8].

- Future Research Directions

- Further investigations are needed to:
- Quantify the direct correlation between denture wear duration and gastrointestinal pathology.
- Explore biomaterials with enhanced resistance to wear and microbial colonization.
- Develop patient-centered dietary programs for individuals with prosthetic limitations.
- Assess the role of implant-based prostheses in preventing systemic complications in geriatric populations.

Conclusion

Worn-out dental prostheses are a critical but often overlooked factor influencing digestive health. By impairing mastication, salivation, and bolus formation, they initiate a cascade of physiological disturbances that manifest as gastrointestinal disorders, nutrient deficiencies, and reduced quality of life. Preventive care, timely replacement, and advanced prosthetic designs are essential in mitigating these risks. A multidisciplinary approach that integrates dentistry, nutrition, and gastroenterology offers the best outcomes for patients.

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