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## Introduction

Periodontal diseases commonly referred to as gum diseases, encompass a range of inflammatory conditions affecting the tissues surrounding and supporting the teeth [1]. These conditions can vary from simple gum inflammation (gingivitis) to serious diseases resulting in major damage to the soft tissue and bone that support the teeth (periodontitis) [2]. If left untreated, periodontal diseases can lead to tooth loss and may have significant implications for overall health [3]. Periodontal diseases commonly referred to as gum diseases, encompass a range of inflammatory conditions affecting the tissues surrounding and supporting the teeth [4]. These conditions are primarily caused by bacterial infections resulting from the accumulation of dental plaque. Periodontal diseases are among the most common oral health issues worldwide, affecting millions of people and contributing significantly to tooth loss in adults [5].

The understanding of periodontal diseases has evolved significantly over the centuries. Ancient civilizations, including the Egyptians, Greeks, and Romans, recognized the presence of gum diseases and made rudimentary attempts to treat them [6]. However, it wasn't until the late 19th and early 20th centuries that scientific advancements

began to uncover the microbial etiology and pathophysiology of periodontal diseases [7]. The pioneering work of researchers like Pierre Fauchard, often referred to as the father of modern dentistry, laid the groundwork for contemporary periodontal science [8].

Periodontal diseases are prevalent and can have significant implications for oral and systemic health [9]. Understanding their etiology, pathogenesis, risk factors, and clinical manifestations is crucial for effective diagnosis, treatment, and prevention. Advances in periodontal research continue to enhance our ability to manage these conditions, ultimately improving the quality of life for affected individuals [10].

## Types of periodontal diseases

### Gingivitis

Gingivitis is the mildest form of periodontal disease. It involves

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inflammation of the gingiva (gums) without affecting the underlying bone or connective tissue. Gingivitis is characterized by:

**Symptoms:** Red, swollen gums that may bleed during brushing or flossing.

**Causes:** Plaque accumulation on teeth is the primary cause. Plaque is a sticky film of bacteria that forms on teeth.

**Treatment:** Good oral hygiene practices, such as regular brushing and flossing, and professional dental cleanings can typically reverse gingivitis.

### Periodontitis

Periodontitis occurs when gingivitis progresses and affects the tissues and bone that support the teeth. The stages of periodontitis include:

#### Early periodontitis

**Symptoms:** Slight loss of bone that supports the teeth.

**Treatment:** Scaling and root planing (deep cleaning) may be necessary.

#### Moderate periodontitis

**Symptoms:** Increased bone loss, mild to moderate deepening of periodontal pockets, and possible tooth mobility.

**Treatment:** More extensive cleaning, possible use of antibiotics, and sometimes surgical intervention.

#### Advanced periodontitis

**Symptoms:** Severe bone loss, deep periodontal pockets, significant tooth mobility, and potential tooth loss.

**Treatment:** Surgical procedures, such as flap surgery or bone grafting, may be required.

### Causes and risk factors

Several factors contribute to the development and progression of periodontal diseases:

**Poor oral hygiene:** Inadequate brushing and flossing can lead to plaque buildup, which is the primary cause of gingivitis and periodontitis.

**Smoking and tobacco use:** Tobacco use is one of the most significant risk factors for periodontal diseases. It impairs blood flow to the gums, reducing the ability to fight infections.

**Genetics:** Some individuals are genetically predisposed to periodontal diseases.

**Chronic diseases:** Conditions such as diabetes can increase the risk and severity of periodontal diseases.

**Hormonal changes:** Hormonal fluctuations during pregnancy, menstruation, and menopause can make gums more sensitive and susceptible to gingivitis.

**Medications:** Certain medications can reduce saliva flow, leading to a dry mouth, which can increase the risk of gum disease.

**Poor nutrition:** A diet lacking essential nutrients can compromise the immune system and increase susceptibility to infections, including periodontal diseases.

### Diagnosis

Diagnosis of periodontal diseases typically involves:

**Medical and dental history:** Understanding the patient's history can help identify risk factors.

**Clinical examination:** Examination of the gums, measurement of periodontal pocket depths, and assessment of tooth mobility.

**Dental X-rays:** X-rays can reveal bone loss associated with periodontitis.

**Periodontal probing:** A periodontal probe is used to measure the depth of pockets around each tooth.

### Treatment

Treatment strategies for periodontal diseases vary based on the severity of the condition:

#### Non-Surgical treatments

##### Professional dental cleaning

To

