



# Modern Aspects Of Etiology, Pathogenesis, Diagnosis And Treatment Of Chronic Generalized Periodontitis

**Azimov Saidabrор Kayumjon ugli**

Assistant at the Department of Therapeutic Dentistry, Uzbekistan, Andijan

**ABSTRACT**

Chronic Generalized periodontitis is one of the most common inflammatory and destructive pathologies of periodontal tissues and is a leading cause of premature tooth loss in adults. The disease is characterized by a multifactorial etiology, complex pathogenesis, and a close relationship with general somatic pathology. This article presents an analysis of current data on the etiological factors and pathogenetic mechanisms of the development of chronic generalized periodontitis. The clinical manifestations of the disease depending on the severity, modern diagnostic methods, including clinical, radiological, and laboratory approaches are considered. Particular attention is paid to the principles of comprehensive treatment, including conservative, surgical, and preventive measures aimed at stabilizing the pathological process and preventing relapse. The need for an individualized and interdisciplinary approach to the management of patients with chronic periodontitis is demonstrated. generalized periodontitis.

**Keywords:**

Chronic generalized periodontitis ; periodontal diseases; inflammation; pathogenesis; diagnostics; complex treatment; prevention; alveolar bone resorption .

**Introduction**

Periodontal disease is a leading cause of dental morbidity worldwide and represents a significant medical and social problem. According to the World Health Organization, signs of inflammatory periodontal disease are found in 70–90% of the adult population, with severe forms of periodontitis occurring in 10–15%. Chronic generalized periodontitis (CGP) is the leading cause of tooth loss in individuals over 35–40 years of age, significantly reducing patients' quality of life and impairing chewing function, aesthetics, and psychological well-being.

Modern understanding of periodontitis views it as a multifactorial inflammatory and destructive disease caused by a complex interaction of microbial, immune, vascular, and metabolic factors. In recent decades, a close association

between periodontal disease and systemic pathologies—diabetes mellitus, cardiovascular disease, metabolic syndrome, and rheumatoid arthritis—has been established, highlighting the systemic nature of the pathological process.

Despite significant progress in understanding its pathogenesis and developing new treatment methods, chronic generalized periodontitis remains a pressing issue. Its high prevalence, tendency to recur and progress, and the limited effectiveness of standard treatment approaches necessitate further refinement of diagnostic and therapeutic strategies.

**The purpose of this article** is to analyze modern data on the etiology, pathogenesis, clinical manifestations, diagnosis and complex treatment of chronic generalized periodontitis.

**Etiology of chronic generalized periodontitis**

Microbial factors play a leading role in the development of chronic periodontal disease. The primary etiologic agent is dental plaque, a complex biofilm consisting of over 700 species of microorganisms. *Porphyromonas bacteria* are considered the most significant periodontopathogenic bacteria. *gingivalis*, *Tannerella forsythia*, *Treponema denticola*, *Aggregatibacter actinomycetemcomitans*, which have pronounced virulent properties.

In addition to the microbial factor, local and systemic predisposing factors are also significant. Local factors include malocclusion, crowded teeth, poor-quality orthodontic restorations, overhanging fillings, traumatic occlusion, and poor oral hygiene. These factors contribute to plaque retention and chronic inflammation.

General risk factors include endocrine disorders, especially diabetes, cardiovascular disease, immunodeficiency, smoking, chronic stress, and vitamin deficiencies. Smoking is recognized as one of the most significant modifiable risk factors, as nicotine and tobacco combustion products impair periodontal microcirculation and suppress the local immune response.

### Pathogenesis of the disease

Pathogenesis of chronic Generalized periodontitis is a complex cascade of inflammatory and immunopathological reactions. The initial stage is the accumulation of microbial biofilm in the cervical region of the teeth, which leads to activation of the innate immune system. Epithelial cells and macrophages secrete proinflammatory cytokines—interleukins (IL-1 $\beta$ , IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), prostaglandins, and matrix metalloproteinases.

These mediators cause the destruction of periodontal connective tissue structures, degradation of the collagen fibers of the periodontal ligament, and alveolar bone resorption. The RANK/RANKL/OPG system, which regulates osteoclast activity, plays a key role in bone destruction.

Chronic inflammation is accompanied by impaired microcirculation, tissue hypoxia, increased lipid peroxidation, and decreased antioxidant defenses. These changes contribute

to disease progression and the formation of periodontal pockets.

### Classification of chronic generalized periodontitis

In clinical practice, the most widely used classification is based on severity:

**Mild degree.** Periodontal pocket depth up to 3–4 mm, moderate hyperemia and bleeding of the gums, initial resorption of the alveolar bone.

**Moderate degree.** Pocket depth 4–6 mm, pronounced inflammatory reaction, tooth mobility of I–II degree, bone resorption up to 1/2 of the root length.

**Severe degree.** pocket depth more than 6 mm, purulent discharge, tooth mobility of II–III degree, bone resorption more than 1/2 of the root length.

### Clinical picture

The clinical manifestations of chronic generalized periodontitis are characterized by a fluctuating course with alternating phases of exacerbation and remission. The main patient complaints include bleeding gums when brushing, bad breath, itching and discomfort in the gums, exposed tooth necks, and increased sensitivity to thermal stimuli.

Examination reveals swollen and hyperemic gums, the presence of plaque and tartar, as well as periodontal pockets of varying depth. In severe cases, purulent discharge, tooth migration and divergence, and impaired chewing function are observed.

### Modern diagnostic methods

A periodontal examination is mandatory, including pocket depth measurements, hygiene indices (OHI-S), inflammation indices (PMA), and bleeding indices (SBI).

Radiographic methods—such as targeted radiography, orthopantomography, and cone-beam computed tomography—allow one to assess the degree of alveolar bone resorption. Modern methods include microbiological examination of periodontal pocket contents and the determination of inflammatory biomarkers in saliva.

### Principles of treatment of chronic generalized periodontitis

Treatment of chronic periodontal disease (CGP) should be comprehensive, step-by-step, and individualized. The main goals of therapy are

eliminating inflammation, suppressing pathogenic microflora, restoring periodontal tissue function, and preventing relapse.

**Conservative treatment** includes professional oral hygiene, scaling, antiseptic treatment of pockets, and the use of anti-inflammatory and antibacterial medications. Chlorhexidine, metronidazole, and hyaluronic acid-based medications are widely used.

**Surgical treatment** is indicated for moderate to severe disease and includes curettage, periodontal pockets, flap operations, guided tissue regeneration.

**Orthopedic and orthodontic correction** is aimed at eliminating traumatic occlusion and stabilizing dental arches.

### Prevention and prognosis

Prevention of chronic generalized periodontitis is based on regular oral hygiene, professional teeth cleaning at least twice a year, risk factor management, and treatment of associated conditions. Patient education on personal hygiene and motivation for long-term follow-up are also crucial.

The prognosis for the disease depends on the stage of the disease, the timeliness of treatment, and the patient's compliance. With early diagnosis and a comprehensive approach, long-term tooth preservation and stabilization are possible.

### Conclusion

Chronic Generalized periodontitis is a multifactorial disease with a progressive course and high prevalence. Current data demonstrate the need for an interdisciplinary approach to its treatment, taking into account systemic risk factors. The development and implementation of new diagnostic and therapeutic technologies will improve the effectiveness of therapy and the quality of life of patients.

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