International Journal on Science and Technology (IJSAT)
E-ISSN: 2229-7677 ● Website: www.ijsat.org ● Email: editor@ijsat.org

Periodontal Abscess: A Review

Tejas Pande, Subharchana Das, Piyush Yadav, Manya Gupta, Akshita Yadav

Abstract

A periodontal abscess is a localized purulent infection affecting the supporting structures of a tooth. Unlike periapical abscesses, which originate from the pulp, periodontal abscesses arise from pre-existing periodontal pockets or due to trauma, obstruction, or foreign body impaction. This review summarizes the etiology, clinical features, differential diagnosis, and management strategies for periodontal abscesses, with an emphasis on timely intervention to prevent further periodontal breakdown.

Keywords: Periodontal abscess, swelling, emergency, drainage, periodontal infection

1. Introduction

Periodontal abscesses are acute infections characterized by rapid onset, pain, swelling, and suppuration from the gingival tissues. They are considered a dental emergency due to the risk of rapid tissue destruction and systemic involvement. Understanding the underlying causes and treatment protocols is essential for effective management(1,2).

These abscesses most often occur in patients with existing periodontal disease, where the periodontal pocket provides a route for bacterial infiltration. Unlike periapical abscesses, which are related to the tooth pulp and non-vital teeth, periodontal abscesses arise from an infection within the periodontium surrounding a vital tooth. This distinction is crucial for diagnosis and treatment(2).

The incidence of periodontal abscesses has increased with the prevalence of untreated or poorly managed periodontitis. Factors such as inadequate oral hygiene, lack of regular dental care, and compromised immune responses contribute to their development. Furthermore, the improper use of antibiotics or incomplete scaling and root planing can exacerbate the condition, creating an environment conducive to abscess formation(3,4).

From a clinical standpoint, timely recognition and intervention can prevent severe outcomes, including irreversible attachment loss, tooth loss, and systemic spread of infection. As such, dental practitioners must be equipped to identify and manage these lesions promptly and comprehensively(5).

Epidemiological data suggest that periodontal abscesses account for a significant portion of dental emergencies, particularly among adults with moderate to severe periodontitis. They can also manifest during supportive periodontal therapy when deep pockets harbor residual calculus or become re-infected. In some cases, patients undergoing orthodontic treatment or those with occlusal trauma are also at risk, especially if oral hygiene practices are suboptimal(2,6).

Additionally, emerging research has highlighted the role of biofilm composition and host immune response in abscess formation. The interplay between microbial virulence factors and host defense mechanisms can

influence the severity and progression of the abscess. As a result, personalized treatment planning, which considers the patient's systemic health and periodontal status, is becoming increasingly important in managing these infections(7,8).

Raising awareness among patients about the signs of periodontal abscesses and promoting regular periodontal evaluations are key preventive strategies. Early detection, combined with evidence-based clinical interventions, can significantly reduce the risk of complications and improve long-term oral health outcomes(9).

2. Etiology:

The primary cause is bacterial invasion of the periodontal tissues, often due to:

- Blockage of periodontal pockets (e.g., from food debris or calculus)
- Incomplete scaling and root planing
- Trauma to the gingiva or periodontal ligament
- Foreign object impaction (e.g., popcorn husks, toothbrush bristles)
- Systemic factors compromising immunity
- Poorly controlled diabetes mellitus, which impairs neutrophil function and healing
- Smoking, which reduces vascularity and host defense mechanisms
- Iatrogenic factors such as subgingival margin restorations or overhanging dental restorations
- Rapid progression of untreated periodontitis
- Use of certain medications like immunosuppressants or corticosteroids
- Stress, which can alter immune response and contribute to disease progression
- Orthodontic appliances causing localized irritation or plaque accumulation

In many cases, multiple factors co-exist, making it critical for clinicians to evaluate both local and systemic contributors. The bacterial profile often includes anaerobic gram-negative organisms, similar to those found in chronic periodontitis, but the acute nature of the abscess indicates a sudden shift in microbial balance or immune response(2,4,8,10,11).

Clinical Features

Typical signs and symptoms include:

- Localized swelling and erythema
- Deep periodontal pockets
- Pain on biting or palpation
- Pus discharge from the gingival sulcus

- Tooth mobility
- Possible lymphadenopathy or fever in severe cases
- Gingival tenderness and sensitivity
- Glossy or shiny appearance of inflamed gingiva
- Possible bad breath or foul taste due to pus
- Increased probing depth and bleeding on probing
- Discomfort during mastication or even spontaneous pain
- Tooth extrusion or feeling of tooth being "high" in the bite
- General malaise or fatigue in systemic involvement(12–14)

Severity Classification:

- **Mild:** Localized swelling with minimal discomfort, no systemic symptoms.
- **Moderate:** Noticeable swelling, spontaneous pain, purulent discharge, localized tooth mobility.
- **Severe:** Extensive swelling, systemic signs such as fever and lymphadenopathy, severe pain, tooth extrusion, possible spontaneous drainage(15).

Differential Diagnosis Comparison Table(2,12,13)

Condition	Key Features	Diagnostic Tools
Periodontal Abscess	Vital tooth, deep periodontal pocket, purulent exudate, localized swelling	Probing, vitality testing, radiographs, clinical exam
Periapical Abscess	Non-vital tooth, radiolucency at apex, pain to percussion, swelling	Vitality testing, periapical radiograph, percussion test
Gingival Abscess	Localized gingival swelling, no pocket or bone loss, often food impaction	Clinical inspection, probing depth, response to local cleaning
Acute Necrotizing Ulcerative Gingivitis	Punched-out papillae, foul odor, necrotic tissue, systemic signs	Clinical presentation, systemic review, bacterial culture if needed
Endodontic-Periodontal Lesion	Combined signs of pulp and periodontal involvement, may be non-vital tooth	Probing, pulp testing, radiographs, history
Vertical Root Fracture	Isolated deep pocket, J-shaped radiolucency, often post-endodontic	Radiographs, transillumination, exploratory surgery
Sinus Tract Infection	Draining sinus unrelated to dental source, may track from sinus or cyst	Radiographs, sinus tracing, medical history
Malignancy (e.g., lymphoma)	Persistent swelling, non-resolving, possibly firm mass, systemic signs	Biopsy, imaging (CT/MRI), systemic work-up
Chronic Osteomyelitis	Chronic pain, swelling, pus discharge, history of previous infection or trauma	Radiographs, culture, history of chronic infection

Periodontal abscess however can be acute or chronic in nature(2,8,12,14,16)**.**

FEATURE	ACUTE PERIODONTAL ABSCESS	CHRONIC PERIODONTAL ABSCESS
Definition	A rapid, painful infection of the periodontal tissues with pus formation and swelling.	A slow-progressing, often asymptomatic infection with pus drainage through sinus tract or periodontal pocket.
Onset	Sudden	Gradual
Pain	Severe, throbbing pain; localized	Mild or no pain; may go unnoticed
Swelling	Present, localized and fluctuant	Usually absent or minimal due to drainage
Gingiva	Red, edematous, shiny; may appear pointed or swollen in the gingival margin	Normal to slightly swollen with possible sinus tract opening
Suppuration (Pus)	May or may not be present during early phase; can be released by applying pressure	Intermittent or continuous pus discharge via pocket or sinus tract
Pocket	Deep periodontal pocket; often sudden increase in depth due to blockage	Chronic deep periodontal pocket with ongoing attachment loss
Tooth Mobility	Increased due to inflammation and pressure	May or may not be present
Percussion Sensitivity	Often tender on percussion	Generally not sensitive unless acute flare-up occurs
Radiographic Findings	Bone loss may not be evident initially; may show vertical defect or radiolucency later	Angular bone loss or radiolucency near root surface or furcation region
Histopathology	Neutrophilic infiltration, microabscess formation, edema, vascular congestion	Chronic inflammatory infiltrate with plasma cells, lymphocytes, and fibrosis
Pus Drainage	Not spontaneously draining unless ruptured	Drains through pocket or sinus tract
Fistula/Sinus Tract	Absent initially	Common finding
Treatment	Drainage (via pocket or incision), local debridement, antibiotics (if systemic signs present), pain management	Scaling and root planing, surgical access if needed, control of infection, systemic antibiotics rarely needed unless reinfected

Management(2,13,17)

1. Drainage of the Abscess
2. Mechanical Debridement
3. Systemic Antibiotics
4. Pain Management
5. Occlusal Adjustment
6. Temporary Splinting
7. Local Irrigation
8. Patient Education and Behavior Modification
9. Follow-Up and Reevaluation
10. Definitive Periodontal Therapy
11. Maintenance Phase

Management Flowchart

Initial Presentation → Clinical & Radiographic Evaluation

↓

Presence of Abscess → Drainage + Debridement

↓

Systemic Symptoms? → Yes → Prescribe Antibiotics

↓

No → Pain Control + Local Measures

↓

Reevaluation in 1–2 Weeks → Residual Pocket?

↓

Yes → Surgical Intervention / Regenerative Therapy

↓

Ongoing Maintenance and Monitoring

3. Prognosis

With early intervention, the prognosis is generally good. Prompt drainage, effective debridement, and elimination of the underlying cause significantly reduce the risk of complications. Most cases resolve without long-term damage if managed correctly at an early stage.

However, the prognosis depends on several factors:

- Extent of Periodontal Destruction
- Systemic Health
- Patient Compliance
- Tooth Mobility and Occlusal Trauma
- Type and Frequency of Recurrence(2,8,14)

Case 1: A 42-year-old male with controlled type 2 diabetes presented with a periodontal abscess on the mandibular molar. After drainage, scaling, and antibiotic therapy, the site healed with minimal bone loss. The patient maintained good plaque control, and no recurrence was observed during the 12-month follow-up.

Case 2: A 58-year-old smoker with generalized periodontitis experienced recurrent abscesses on different quadrants. Despite initial treatment, poor compliance and ongoing tobacco use led to further attachment loss and eventual extraction of two posterior teeth. This case highlights the impact of modifiable risk factors on prognosis.

4. Conclusion:

Periodontal abscesses, while often acute and painful, are manageable with prompt and appropriate care. Proper diagnosis, thorough debridement, and patient education are the pillars of successful treatment and prevention.

A comprehensive approach that addresses both the acute infection and the underlying periodontal condition is essential for achieving favorable outcomes. Clinicians must not only resolve the immediate symptoms but also focus on long-term periodontal stability. This includes managing systemic risk factors, reinforcing oral hygiene practices, and ensuring consistent follow-up through a tailored maintenance schedule.

Ongoing research into microbial profiles, host immune responses, and emerging therapies may further refine diagnostic tools and treatment protocols. Integration of these advances into routine dental care will improve patient outcomes and reduce the burden of periodontal abscesses in the broader context of periodontal disease management.

References

1. Alharbi OA, Ahmad MZ, Agwan AS, Sadaf D. Management of Acute Periodontal Abscess Mimicking Acute Apical Abscess in the Anterior Lingual Region: A Case Report.
2. Boyapati R. Periodontal abscess –A sneak peek.
3. Radu CM, Radu C, Arbănaşi EM, Hogea T, Murvai V, Chiș IA, et al. Exploring the Efficacy of Novel Therapeutic Strategies for Periodontitis: A Literature Review. Life. 2024 Apr 3;14(4):468.
4. Herrera D, Alonso B, De Arriba L, Santa Cruz I, Serrano C, Sanz M. Acute periodontal lesions. Periodontol 2000. 2014 Jun;65(1):149–77.
5. Oral Health in America.
6. Alassy H, Pizarek JA, Kormas I, Pedercini A, Wolff LF. Antimicrobial adjuncts in the management of periodontal and peri-implant diseases and conditions: a narrative review. Front Oral Maxillofac Med. 2021 Jun;3:16–16.
7. Vestby LK, Grønseth T, Simm R, Nesse LL. Bacterial Biofilm and its Role in the Pathogenesis of Disease. Antibiotics. 2020 Feb 3;9(2):59.
8. Sharma S, Mohler J, Mahajan SD, Schwartz SA, Bruggemann L, Aalinkeel R. Microbial Biofilm: A Review on Formation, Infection, Antibiotic Resistance, Control Measures, and Innovative Treatment. Microorganisms. 2023 Jun 19;11(6):1614.
9. Herrera D, Meyle J, Renvert S, Jin L. White Paper on Prevention and Management of Periodontal Diseases for Oral Health and General Health.
10. Łasica A, Golec P, Laskus A, Zalewska M, Gędaj M, Popowska M. Periodontitis: etiology, conventional treatments, and emerging bacteriophage and predatory bacteria therapies. Front Microbiol. 2024 Sep 26;15:1469414.
11. Rose LF. PERIODONTICS MEDICINE, SURGERY, and IMPLANTS.
12. Reddy S. Essentials of clinical periodontology and periodontics. Fifth edition. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2018.
13. Bathla S, Damle SG. Textbook of periodontics / Shalu Bathla ; foreword SG Damle. First edition. New Delhi: The Health Sciences Publisher; 2017.
14. Newman MG, Takei HH, Carranza FA, editors. Carranza's clinical periodontology. 10th ed. St. Louis, Mo: Saunders/Elsevier; 2006. 1286 p.
15. Bhagat S, Jaiswal P, Kotecha SV. Clinical Features, Etiopathogenesis, and Therapeutic Approaches of Acute Gingival Lesions: A Narrative Review. Cureus [Internet]. 2024 Aug 18 [cited 2025 Apr 26]; Available from: https://www.cureus.com/articles/252062-clinical-features-etiopathogenesis-and-therapeutic-approaches-of-acute-gingival-lesions-a-narrative-review
16. Silva GLM, Soares RV, Zenóbio EG. Periodontal Abscess during Supportive Periodontal Therapy: A Review of the Literature. J Contemp Dent Pract. 2008 Sep;9(6):82–91.
17. Dds MGN. Newman and Carranza's Clinical Periodontology.