

Periodontal abscess –A sneak peek

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Abstract

A periodontal abscess, synonyms being lateral abscess or parietal abscess, is characterized by accumulation of pus locally within the supporting apparatus of periodontium. Generally these abscesses are acute or sudden in onset and are characteristically classified on the basis of its location. Interestingly these periodontal abscess remain mostly painless and occurs as a sequel of progressive periodontal diseases. The immune response of the host harnessed as local and systemic resistance demarcates the proliferation and multiplication of the microorganisms within the gingival soft tissue. Incomplete debridement of the periodontal pocket serves as another major etiology. Inoculation of the bacteria into the periodontal tissue occurs as a result of various penetrating injuries like bristle of the toothbrush or food remnants like fish bone etc. Endodontic procedural accidents like root canal perforations also could pave way for abscess formation as a result of an established endo-perio lesion. Signs and symptom: the main symptom is pain, worsened by biting associated with mobile tooth surrounded by erythematous, swollen mucosa, characterized by regional lymphadenitis and systemic illness. Treatment of periodontal abscess mainly involves adequate and robust management of the acute lesion followed by addressing the original or underlying residual lesions. Incision and drainage being the primary emergence protocol could be established through various pathways like pocket lumen, subgingival scaling and root planning and curettage of the pocket epithelium followed by systemic antibiotics and analgesics.

Keywords: Periodontal abscess, Periodontal pocket, Tooth mobility, Gingival abscess

Introduction

Periodontal abscess is one of the few clinical situations in Periodontics, where patient may seek immediate care. Periodontal abscess is a localized purulent infection of periodontal tissues seen with moderate and advanced periodontitis. Sometimes it can even persist in patients who have already underwent periodontal treatment and is in under maintenance phase. It is known as “*lateral abscess or parietal abscess*”.⁽¹⁾ Common periodontal pathogens have been observed in this lesion and some etiologic factors may be responsible for its recurrence. This condition can be isolated or associated with factors that can change the prognosis of affected teeth.⁽¹⁴⁾

Classification⁽²⁾

1. Depending on the location of the abscess (Gillette and Vay House 1980 AGI et al 1986).

- A. Gingival abscess – localized painful swelling affecting only the marginal and inter dental gingival caused by impaction of particles.
- B. Periodontal abscess – affects deeper structures like pockets, furcations, osseous defects usually located beyond mucogingival junction.

2. Depending on the course of the lesion (Galego-Feul et al 1995, carranza 1990)

- A. Acute periodontal abscess.
- B. Chronic Periodontal abscess

3. Depending on the number (Topollet al 1990)

- A. Single periodontal abscess
- B. Multiple periodontal abscess

4. According to Meng (1999)

Gingival abscess in previously healthy site or infected site:

- A. Periodontal abscess – either acute or chronic in origin
 - B. Periodontal abscess – in incompletely erupted teeth.
- 5. Depending on the cause of acute infectious process (Lindhe – 4th edition)**
- A. Periodontitis related abscess
 - B. Non-periodontitis – related abscess.
- 6. According to Carranza (4th edition):** Based on location (1990)
- A. Abscess in the supporting periodontal tissues along the lateral aspect of the root resulting in sinus formation in the bone that extends laterally from the abscess to the external surface.



- B. Abscess in the soft tissue wall of a deep periodontal pocket.



Prevalence: There is high prevalence of periodontal abscess which contributes to approximately 6-14% of all dental emergencies. Of all commonly encountered dental emergencies, periodontal abscess is rated in the third position after pulpal infection (14%-25%), followed by pericoronitis (10%-11%).

Definition: A periodontal abscess is a localized purulent inflammation in the periodontal tissues. (Glickman)

Pathogenesis of periodontal abscess

Formation of periodontal abscess might occur in the following ways:

1. Localization of the infectious inflammatory process occurs along the lateral surface of the root as a result of extension of infection into deeper periodontal supporting tissues form periodontal pocket.
2. The inflammatory process can also penetrate into the connective tissue of the pocket wall as a result of lateral extension of the infection along the inner surface of the pocket depending on the pathway of least resistance.
3. In furcations two walled defect as seen in cul-de-sac defect, the periodontal abscess generally follows a tortuous course along the root.
4. Occlusion of the pocket orifice resulting in the shrinkage of the gingival wall as a result of incomplete removal of the calculus during periodontal pocket treatment.
5. Periodontal abscess can also occur in the absence of periodontal disease in situations of perforations of lateral wall of the root during endodontic therapy.^{(1),(10)}

Gingival Abscess

Abscess localized in the gingiva, caused by injury to the outer surface of the gingival and not involving the

supporting structures are called gingival abscess (Carranza – 4th Edition).

Etiology

- Forceful impaction of a foreign object into the gingival sulcus.
- Either directly associated with periodontitis or in sites without prior existence of a periodontal pocket.



a. Post therapy periodontal abscess

1. Post scaling periodontal abscess – occurs due to small fragments of remaining calculus or the fragments which have been accidentally forced into deep pockets.
2. Post-surgery periodontal abscess –occasionally the presence of foreign substances like sutures, regenerative materials and periodontal pack and incomplete removal of sub gingival calculus could pave way for post-surgical periodontal abscess.
3. Post-antibiotic periodontal abscess – change in the sub gingival microbiota occurs as a result of treatment of advanced periodontitis with only systemic antibiotics without subgingival debridement resulting in unresolved inflammation and superinfection.

b. **Non-periodontitis related abscess:** could be of gingival or periapical origin. Ex: impingement of foreign bodies like orthodontic elastics, piece of dental floss /tooth pick, dislodged restoration, cemental tear etc.

c. Oral hygiene abscess

Periodontal abscess caused by foreign bodies related to oral hygiene aids is known as oral hygiene abscess.

Clinical features: Associated with a pre-existing periodontal pockets or with impaction of foreign particles.

Signs: associated bleeding on probing, suppuration and sometimes increased tooth mobility.

Symptoms:

- Gingival and / oral mucosal swelling associated with erythematous classical symptoms of inflammation.
- Affected tooth / Teeth – tender on chewing and sensitive to percussion.
- Tooth may feel high on occlusion as a result of extrusion from the alveolar socket associated with appreciable mobility.
- Presence of sinus tracts in chronic abscess.
- Spontaneous suppuration or upon pressure.
- Regional lymphadenopathy and systemic illness.⁽¹⁰⁾

Radiological Findings: Radiographic findings of the may either present as a normal appearing tooth with widening of the periodontal ligament space or as a radiolucent area along the lateral aspect of the root surface.

Histopathology of Periodontal Abscess: Periodontal abscess contains bacteria and its byproducts along with cells of inflammation and tissue breakdown elements. Periodontal abscess is formed by occlusion or trauma to the orifice of the pocket resulting in spread of the inflammation from the pocket into the soft tissue pocket wall. Concomitant inflammatory reaction leads to destruction of the connective tissue, encapsulation of the bacterial infection and the production of pus.

Histologically, intact neutrophils are found surrounding a central area of soft tissue debris and destroyed leukocytes. At a later stage a pyogenic membrane, composed of macrophages and neutrophils is organized. The destructive process is also guided by the virulence of the bacteria, host resistance, local pH.

Dewitt et al (1985) gives 5 zone from the outside to the inside.

1. Abnormal oral epithelium and lamina propria
2. An acute inflammatory infiltrate
3. Intense foci of inflammation
4. A destroyed and ulcerated pocket epithelium.
5. A central region, as a mass of granular, acidophillic debris.

Microbiology

- Periodontal abscess is caused by Polymicrobes and orally inhabited bacterial flora. Streptococcus viridans, Staphylococcus, Non haemolytic streptococci, Neisseria, diphtheroids and Escherichia coli.
- Using Dark field microscopy high proportion of spirochetes (40-6%) & low percentage of cocci (19.7%) and motile rods 7.5% (Trope et al 1988).

Diagnosis

1. Patients chief complaint
2. Clinical signs and symptoms
3. Pulp vitality tests

4. Radiological examination.
5. Microbial tests
6. Also include information regarding impaction of foreign objects (in case of gingival abscess and oral hygienic abscess).⁽⁵⁾

A. **Von Winkel Hoff et al (1985)** diagnostic criteria for periodontal abscess

1. Association with pocket of > 6 mm
2. Bleeding on probing.
3. Evidence of radio alveolar bone loss, and
4. Absence of periapical lesions.

B. **Trope et al (1988)** recommended Dark field microscopic examination to exclude on endodontic origin.

C. **Liu et al (1996)** recommended – position emission tomography and a flurine –18 – fluromisonidazole marker for detection of periodontal abscess.

Differential diagnosis (Carranza – 1990)

1. Gingival Abscess.
2. Pericoronal Abscess.
3. Periapical Abscess
4. Non infected Periodontal Cyst
5. Osteomyelitis
6. Eosinophilic granuloma
7. Endo Perio lesions and Perio Endo lesions

**Pericoronal Abscess****Treatment**

Treatment of acute periodontal abscess usually involves 2 stages

1. As abscess is considered as a dental emergency arising in acute duration, the primary and initial therapy is aimed at management of the acute lesion.
2. After addressing the acute lesion in the emergency phase, the underlying etiology has to be treated in the subsequent treatment phase.

Acute periodontal abscess**Purpose**

1. To alleviate the pain
2. Control the spread of infection, to prevent further periodontal attachment loss.
3. Establish drainage.

Protocol recommended

1. Incision and drainage (closed approach – through pocket)
2. Scaling and Root planning
3. Compression and debridement of soft tissue wall (open approach - curettage of granulation tissue)
4. Saline irrigation
5. Use of systemically administered antibiotics
6. Tooth extraction

Instructions

- Rinse with warm saline
- Follow up for the abscess reduction after 24-48 hrs.
- Instructed to avoid exertion and placed on a copious fluid diet
- Analgesic and antibiotic.
- Definitive treatment is carried out 1 week later.

Antibiotic administrations⁽⁸⁾

1. Metronidazole – 400mg (BID) 5 days
2. Tetra cycline – 1 gm / day – 2weeks
3. Azithromycin, 500mg, OD, 3 days, (**Bacteriostatic**)
4. Amoxicillin + Clavulanate potassium , 500 + 125 mg, TID, 8days (**Bacteriocidal**)
5. Penicillins(cidal)
6. Cephalexim (Cidal)
7. Cytibuten (Cidal)
8. Clindamycins (Static/cidal)

Definitive Treatment: Prime motive of the definitive treatment lies in restoration of the function and aesthetics and ultimately help the patient maintain the health of the periodontium. Hence the definitive periodontal treatment is done according to the treatment needs of the patients.

Chronic periodontal abscess

Surgical therapy - gingivectomy & flap procedures

Objective: To address the emergency through incision and drainage and to eliminate the underlying etiology.

Complication: Like any other infectious process, even periodontal abscess possesses a serious threat when left

untreated as it displays the possibility to spread microorganisms to other parts of body which can results into bacteremia, infection of orofacial region, Ludwig's angina, pulmonary actinomycosis or brain abscess. The risk of bacteremia during drainage of an abscess can be reduced if, before incision a needle aspiration of content of abscess is done. Tooth loss is seen cases of advanced to moderate periodontitis.⁽⁶⁾

Cervical necrotising fasciitis, Necrotising cavernositis, Gingival necrotizing fasciitis can also result as severe complication of periodontal abscess.

Conclusion

As mentioned above, among all the frequently encountered dental emergencies, periodontal abscess is graded as the third most prevalent emergency. Among several factors associated with formation of the periodontal abscess, a few includes occlusion of the orifice of a deep periodontal pocket, systemic antibiotic therapy without periodontal treatment and poorly controlled diabetes. When it comes to diagnosis of the periodontal abscess, the information gathered from the patient in the form of chief complaint, along with clinical and radiological findings play a crucial role. The microbial flora is primarily Gram –ve anaerobic rods and is unspecific, periodontal pathogen such as P.gingivalis, P. intermedia, F. nucleatum are most prevalent. The periodontal abscess has the possibility to spread to other sites with the possibility of causing serious infections.

References

1. Clinical periodontology – 11th and 12th edition.
2. Clinical periodontology and implant dentistry – 5th edition by Lindhe.
3. Contemporary Periodontics – Genco, Cohen and Goldman.
4. DCNA, July 1986, Vo. 30, No.3.
5. Periodontal abscess review JCP-200,27:377-386.
6. Periodontal abscess, Ann. Periodontal – 199:4:79-82.
7. Self – inflicted gingival injury – BDJ-1995,Vol. 178,246 (Beckett H et al).
8. JADA, 1991, 122, 31-38. Genco, RJ. Using antimicrobial agents and Periodontal disease.
9. JCP – 1990 –15, 268-72 (Multiple periodontal abscess after antibiotic therapy by Topoll MM et al).
10. Parameter as acute periodontal disease JP. 200;71:863-866.
11. Periodontal Abscess: etiology, diagnosis and treatment, Fogorv Sz, Valvi P, Gorbz, 2004 Aug;97(4):151-5.
12. Periodontal abscess: a review of the literature. Silva GL, Soares RV, Zenóbio EG.J Contemp Dent Pract. 2008 Sep 1;9(6):82-91.
13. Abscesses of periodontal origin Actual Odontostomatol (Paris). 1977 Mar;(117):137-57.