

Maneuvering Abscesses Management

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ABSTRACT

Dental abscess is a localized collection of pus, which can result from a number of reasons including dental caries, trauma or failed dental root canal treatment. According to the tissues affected, they can be classified into gingival abscess, periodontal abscess and pericoronal abscess. Correlation of history, clinical and radiographic findings are required for the correct diagnosis and differentiation of the different abscesses. If left untreated these abscesses can cause significant risk for the patient. The management and disposition should be carefully done so that it does not lead to any further complications. The fate of the infection depends upon the virulence of the bacteria, host resistance factors and regional anatomy.

Keywords: Gingival Abscess, Periodontal Abscess, Pericoronal Abscess, Management

Introduction

Dental Abscess

Dental abscess is a term used to describe localized collection of pus in the gingiva, alveolar bone at the root apex of the tooth [1]. It typically arises secondary to dental caries, trauma, or failed dental root canal treatment. Left untreated these infections can be not only extremely painful but also pose a significant risk of descending into the deep neck space or ascending to intracranial sinuses [2].

Classification

It has been classified into three diagnostic groups [3]:

- Gingival abscess
- Periodontal abscess
- Peri-coronal abscess

Gingival Abscess

It is defined as a localized purulent infection that involves the marginal gingiva or interdental papilla. The infection may spread into surrounding tissue, and can progress, damaging the supporting structure of the teeth [3].

Etiology

Acute inflammatory lesion that may arise from a variety of sources, including microbial plaque infection, trauma and foreign body impaction. It is a red, smooth, fluctuant swelling that is confined to gingiva. If the abscess has progressed into the periodontal structure, the periodontal ligament attachment will be lost and the loosening of the teeth takes place [4].

Histopathology

It consists of a purulent focus in a connective tissue surrounded by a diffuse infiltration of polymorphonuclear leukocytes, edematous tissue and vascular engorgement. The surface epithelium has varying degrees of intracellular or extracellular edema, invasion by leukocytes and sometimes ulceration [4].

Clinical Features [4]

- Localized swelling of marginal gingiva or papilla
- Red, smooth, shiny surface
- May be painful and appear pointed
- Purulent exudate may be present
- No previous periodontal disease
- Loosening of the teeth
- Throbbing pain

Diagnosis**Physical Examination [4]**

- **Inspection:** Red, smooth and shiny gingiva
- **Palpation:** Pain and drainage of pus on applying gentle pressure.
- Swollen lymph nodes in neck region.
- **Percussion:** Tenderness on percussion
- **Probing:** Increased probing depth

Radiographic Examination

Gingival abscess doesn't have any marked radiographic findings.

Differential Diagnosis

It is often differentiated from Periodontal abscess, that occurs in the oral cavity which have similar appearance and symptoms but have different etiology.

Periodontal Abscess

Periodontal abscess is also known as Lateral abscess or Parietal abscess. It is a purulent inflammation of the periodontal tissues which is localized and located next to the periodontal pocket. It results in the destruction of Periodontal ligament and also the Alveolar bone [3].

Classification**According to Their Location**

1. Abscess that occurs in the supporting periodontal tissues along the lateral aspect of the root.
2. Abscess that occurs in the soft tissue wall of the deep periodontal pocket [3].

According to Their Onset or Course of Lesion**Acute Periodontal Abscess**

The gingiva appears as a bright red with ovoid elevation, which can be relatively firm or pointed and soft. In most of the cases, pus may be expressed from the gingival margin by applying gentle pressure. It is accompanied by symptoms such as throbbing pain, radiating pain, sensitivity to percussion, tooth mobility, and in some cases, lymphadenopathy and systemic complications like fever and malaise can occur [3].

Chronic Periodontal Abscess

This type of Periodontal abscess usually presents with a sinus that opens onto the gingival mucosa along the length of the root. It is usually asymptomatic, but the patient may complain of intermittent exudation, dull gnawing pain, slight elevation of the tooth, and a desire to bite down on and grind the tooth [3].

Depending on the Number of Abscesses**Single Periodontal Abscess**

They are often related to local factors which contributes to the closure of the periodontal pocket [3].

Multiple Periodontal Abscess

They have been reported in medically compromised patients and also patients affected by Diabetes mellitus [3].

Etiology

They have been associated directly to periodontitis (periodontitis related abscess) or the site without the previous occurrence of a periodontal pocket (Non periodontitis related abscess)

Periodontitis Related Abscess

- Existence of painful, cul-de-sac periodontal pockets, that eventually becomes isolated, which may result in the formation of abscess.
- Due to the pressure of suppuration, marginal closure of the periodontal pocket takes place, which leads to the spread of infection to the surrounding periodontal tissues.
- The insufficient drainage of the increased suppuration in the pocket lumen can be due to the change in composition of microbial flora, bacterial virulence or in host defences.
- If systemic antibiotics are administered in patients suffering from Advanced periodontitis without subgingival debridement, it can cause the formation of abscess.
- Inappropriate scaling can result in the formation of abscess, due to remaining calculus in the deep periodontal area [3].

Non-Periodontitis Related Abscess

- Impaction of foreign substances, such as bristles of toothbrush, a piece of dental floss, elastics used in orthodontic treatment, a dislodged cemental tear, food into the gingival tissue can result in the formation of abscess.
- Lateral perforation of the root during endodontic therapy and trauma to the tooth.
- Local factors affecting morphology of roots such as external root resorption, invaginated tooth, and cracked tooth may predispose to periodontal abscess formation [3].

Clinical Features**Signs and Symptoms****Acute Abscess**

- Mild to severe discomfort
- Localized red, ovoid swelling
- Elevation of tooth in the socket
- Mobility of the tooth
- Mild relief in pain on biting, on the involved tooth
- Exudation
- Elevation in body temperature
- Regional lymphadenopathy can be seen [3]

Chronic Abscess

- No pain or dull pain
- Localized inflammatory lesion
- Slight tooth elevation
- Intermittent exudation
- Fistulous tract often associated with a deep pocket
- Usually without systemic involvement [3]

Histopathology

The first event that initiates the Periodontal abscess is the bacterial entry into the wall of the soft tissue pocket. Then, the chemotactic factors are released to which the inflammatory cells are attracted. The associated inflammatory reaction leads to the

connective tissue destruction and encapsulation of the bacterial infection and results in the production of pus [3].

Pathophysiology

The central area of soft tissue debris and destroyed leukocytes is surrounded by the neutrophils which are histologically intact. And later, the organization of pyogenic membrane composed of neutrophils and macrophages takes place. The purulent area is surrounded by an acute inflammatory reaction and the overlying epithelium exhibits intracellular and extracellular edema and invasion of leukocytes takes place. The pocket epithelium and the altered connective tissue are invaded by the Gram-negative bacteria [3].

Diagnosis

Correlation of history, Clinical and radiographic findings are required for the diagnosis of the periodontal abscess. The previous Periodontal or endodontic treatment, and previous abscess can be known by the dental history.

Physical Examination [3]

Inspection: Ovoid gingival swelling and elevation of the tooth.

Probing: Careful probing should be done in the suspected area. The evidence that the abscess is periodontal, is the continuity of the lesion with the gingival margin. Deep periodontal pockets are present and furcation involvement.

Palpation: Pain and discomfort, mobility of the tooth, discharge of pus on applying gentle pressure or it can also be spontaneous.

Percussion: Tenderness to lateral percussion.

Radiographic Examination

In Radiograph, along the lateral aspect of the root, a discrete area of radiolucency will be present. However, lesions in the soft tissue wall of a periodontal pocket are less likely to produce Radiographic changes than the lesions that are deep in the supporting tissues [3].

Differential Diagnosis

Different signs and symptoms like Pulp vitality, presence of caries vs periodontal pockets, location of the abscess are helpful in the differential diagnosis of the periodontal abscesses. A careful Radiographic examination is also needed for the differential diagnosis. It is differentiated from other abscesses that occurs in the oral cavity which have similar appearance and symptoms but have different etiology such as Gingival and Periodontal abscess [3].

Pericoronal Abscess

It is a localized accumulation of pus within the overlying gingival flap surrounding the crown of a partially erupted tooth. The most common site of peri-coronal abscess or pericoronitis is in a partially erupted or impacted third molar otherwise known as wisdom tooth [5].

Clinical Features

The overlying gingival flap as well as the crown of the tooth creates a focus for pericoronitis and subsequent abscess formation due to the accumulation of food and debris between

them, which results in the subsequent irritation and inflammation of the gingival flap and therefore the tissue is consequently traumatized by the opposing molar tooth [5].

This leads to the infection of the inflamed gingiva and thereby leading to abscess formation which eventually causes foul taste, fever and in severe cases might lead to trismus. Some of the characteristic features of pericoronal abscess including swelling of the cheek and the angle of the jaw, localised lymphadenopathy etc. When there is an advanced spread of the disease posteriorly to the base of tongue, oropharyngeal area as well as the deep cervical spaces may even lead to peritonsillar abscess and Ludwig's angina [5].

Obstruction of the airway is very rare but complication may occur if the pericoronal abscess extends posteriorly into the oropharyngeal area and medially to the base of the tongue and involve the regional lymph nodes. Patients usually have a history of pericoronitis and may experience difficulty in swallowing [5].

Treatment [6]

- Incision and drainage of the abscess with warm saline irrigation, analgesia, and antibiotic coverage and referral for possible extraction of the involved teeth having adverse prognosis.
- **Operculectomy:** Operculectomy is the treatment of choice if the involved tooth has space adequate to erupt completely and in cases where patient is not willing for extraction. Anaesthetic nerve block should be given at the operating molar site. Incision is to be made posterior to the distal molar area and operculum tissue is excised and the remaining fibrous tissues in the distal area is separated which helps in the eruption of the tooth. Then, the operated area is irrigated using Povidone-iodine solution. Post operative instructions must be given to the patient.

Management of Abscesses

Incision and drainage of the abscess, providing antibiotic support, pain control and removal of infectious tooth whole together comprises the treatment. Unless and until the patient present features like fever, dyspnea or when the airway is compromised due to swelling, admission to the hospital and administration of intravenous antibiotics is not required for the management of dental abscesses [2].

Incision and Drainage

Procedure [7]

To avoid contamination, under sterile environment, retract the soft tissues to expose the abscess.

Anaesthesia [7]

- The area should be thoroughly dried using a gauze and suction. To visualize the area a cheek or a tongue retractor can be used.
- With the help of cotton-tipped applicator, apply the topical anaesthetic and wait for 2-3 minutes for the anaesthesia to occur.
- Only when if the anaesthetising needle will not track the infection into uninfected tissue, a site appropriate nerve block is given. Alternatively, Local infiltration can be given into the anterior, posterior and sites along the circumference of the abscess.

- Avoid giving injection in the infected tissue.
- Allow 5-10 minutes for the Anaesthetic to take effect.

Incise and Drain of the Abscess [7]

- Palpation is done to determine the extent and the area where the maximum dependent drainage of the abscess can be done.
- A Stab Incision with a No:11 BP blade is made into the abscess, which should be entering perpendicularly to the underlying tissue and hit the underlying bone.
- Suction and gauze are used for the removal of the draining pus.
- Irrigation is done on the abscess space using a large sterile syringe to which a plastic IV catheter is attached.
- Post-operative instructions should be given to the patient along with antibiotics and analgesics.

Pharmacological Management [8]

- Amoxicillin 250-500 mg qid 5-7 days.
- Metronidazole 200-400 mg tds 5-7 days.
- The use of Metronidazole is contraindicated in pregnant patients and consumption of alcohol.
- If allergy to Penicillin, then Erythromycin 250-500 mg qid 5-7 days, Doxycycline 100mg bd 7-14 days, Clindamycin 150-300 mg qid 5-7 days.

Conclusion

Deep dental caries, foreign body impingement to soft tissues by faulty tooth brushing, inappropriate management of periodontal pocket and poor oral hygiene are the frequent causes of Dental abscesses which causes substantial complication in individuals. Hence, appropriate diagnosis with early intervention is extremely necessary. Dangerous complications can be prevented and symptomatic relief can be given to the patients by early diagnosis, treatment and educating the patients.

Conflict of Interest: Nil

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