

# An Insight into Pericoronitis

Roshan P. Dhonge<sup>1</sup>, R. M. Zade<sup>2</sup>, V. Gopinath<sup>3</sup>, Ramesh Amirisetty<sup>4</sup>

1- Post Graduate Student, Department of Periodontology, Chhattisgarh Dental College And Research Institute, Rajnandgaon, Chhattisgarh (India). 2- Professor, HOD and Dean, Department of Periodontology, Chhattisgarh Dental College And Research Institute, Rajnandgaon, Chhattisgarh (India). 3- Professor, Department of Periodontology, Chhattisgarh Dental College And Research Institute, Rajnandgaon, Chhattisgarh (India). 4- Reader, Department of Periodontology, Chhattisgarh Dental College And Research Institute, Rajnandgaon, Chhattisgarh (India).

Correspondence to:

Dr. Roshan P. Dhonge, 10, Ganesh Vihar No. 1, Near Swastik Nagar and Water Tank, Amravati, Maharashtra, India.

## ABSTRACT

Pericoronitis is inflammation of the soft tissue associated with the crown of a partially erupted tooth. It is seen most commonly in relation to the mandibular third molar. The common symptoms and signs are pain, swelling, trismus, halitosis, bad taste, inflammation of pericoronal flap and pus discharge from underneath it, inflammation sometimes aggravated by trauma from an antagonist tooth. In severe episodes, an acute pericoronal abscess may develop which may remain localized or spread to involve one or more of the adjacent deep surgical spaces and may be associated with systemic as well as local signs and symptoms. The treatment for acute phase include debridement of plaque and food debris, drainage of pus, irrigation with sterile saline, chlorhexidine or hydrogen peroxide, elimination of occlusal trauma and prophylactic antibiotic along with analgesics. The treatment planning for surgical intervention will be made after acute phase subsided. An extraction of partially or completely impacted third molar should be done. If the decision has taken to retain the tooth, in such circumstances removal of pericoronal flap can be done.

**KEYWORDS:** Pericoronitis, Operculum, Wisdom tooth, Operculectomy

## INTRODUCTION

Pericoronitis refers to inflammation of the soft tissue in relation to the crown of an incompletely erupted tooth, including the gingiva and the dental follicle.<sup>1,2</sup> The word *pericoronitis* comes from the Greek word, *peri* means "around", Latin word, *corona* means "crown" and *itis* means "inflammation." It is also known as operculitis. The soft tissue covering over a partially erupted tooth is known as pericoronal flap or gingival operculum. Maintenance of oral hygiene in such area is very difficult to achieve by normal methods of oral hygiene (Figure 1).



Fig 1: Pericoronitis in relation with 48

It is most commonly seen in relation to the third molar, also called as wisdom tooth, particularly of mandibular arch, but it can occur around the base of any tooth that has not erupted completely. Amongst acute oral health problems of young adults, pericoronitis is found to be

ranked as first or second.<sup>3,4</sup> It is most commonly seen in teens and young adults. The highest incidence was found in the 20-29 year age group and rarely seen before 20 or after 40.<sup>5</sup> There was no significant difference found between the sexes. A seasonal variation was seen with the peak incidences during the month of June and December. Pericoronitis mostly seen with involved tooth in 67% of vertical impacted cases, in 12% of mesio-angular cases, in 14% of distoangular cases and in 7% of various other positions. A significant correlation between oral hygiene status of individual and the severity of the condition is present. Bilateral pericoronitis is a rare condition. It may be suggestive of underlying infectious mononucleosis.<sup>6</sup>

## CLASSIFICATION

According to the International Classification of Diseases, pericoronitis can be classified as an acute and chronic pericoronitis.

### a. Acute :

Acute pericoronitis is of sudden onset, short lived but having significant symptoms, such as varying degrees of inflammatory involvement of the pericoronal flap. There is also a presence of systemic involvement. Usually, the acute form of pericoronitis is seen in the patients having moderate or poor oral hygiene.<sup>6</sup>

### b. Chronic :

Pericoronitis may also be classified as a chronic or recurrent. In this category, repeated episodes of acute pericoronitis occur periodically. It may cause few symptoms, but some signs are visible at the time of intraoral examination. The chronic type mostly seen with good or moderate oral hygiene.<sup>6</sup>

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## RISK FACTORS FOR PERICORONITIS

- Presence of unerupted / partially erupted tooth / teeth in communication with the oral cavity. Mandibular third molars (which are placed vertical and distoangular) are most commonly affected.
- Presence of periodontal pocket adjacent to unerupted / partially erupted teeth.
- Opposing tooth / teeth in relation to pericoronal tissues surrounding unerupted / partially erupted tooth / teeth.
- Previous history of pericoronitis.
- Poor oral hygiene status of individual.
- Respiratory tract infections and tonsillitis.<sup>7</sup>

## ETIOPATHOLOGY

The most common site of pericoronitis is impacted or partially erupted mandibular third molar. The most common cause behind pericoronal inflammation is the entrapment of plaque and food debris between crown of tooth and overlying gingival flap or operculum. This is an ideal area for the growth of bacteria and it is difficult to keep clean. There are presences of constant chances of acute inflammation of pericoronal sites. It may be due to aggravating factors such as trauma, occlusion or entrapment of foreign body below the pericoronal flap. Pericoronitis may leads to release of inflammatory tissue fluid and cellular exudate. It further increases the bulk of the pericoronal flap leading to interference with complete closure of jaw. In this way, the process of pericoronal inflammation potentiated by occlusal trauma of the pericoronal tissues by the opposing tooth. Chronic inflammation and infection of operculum is present even if patient is not having any signs or symptoms. On inner surface of operculum, there is presence of varying degrees of ulceration.<sup>1,6</sup> A systemic conditions such as influenza, upper respiratory tract infections or a period of stress may lead to compromised host immune system. So, acute pericoronitis can be considered as an opportunistic infection or may be an opportunistic exacerbation of a chronic process which is normally kept in check by a competent immune system.

## CLINICAL FEATURES

Acute pericoronitis is characterized by a red, swollen, suppurating lesion which is tender, with severe throbbing pain radiating to the ear, throat, floor of the mouth, temporomandibular joint and posterior submandibular region. There may also be a pain while biting. Sometimes, pain may disturb sleep. A persistent impaction of food below the pericoronal flap leads to periodontal pain and pulpitis (secondary to dental caries) are also considered as possible causes of pain associated with a third molar. Patient also complains of pain during swallowing (dysphagia), halitosis, a foul taste and an inability to close the jaws.<sup>1,6</sup> Swelling of the cheek in the region of the angle of the jaw may be evident along with trismus. Signs of trauma on the operculum such as

indentations of the cusps of the upper teeth or ulceration may be seen. Systemic complications can occur such as fever, leukocytosis (increase in number of W.B.C.), malaise, regional lymphadenopathy and loss of appetite. In severe cases, infection may extend in to the adjacent tissue spaces.<sup>1</sup>

Chronic pericoronitis is characterized by a dull pain with mild discomfort lasts for a day or two, with remission lasting for many months. An area of ulceration may be associated with chronic pericoronitis may resembles necrotizing ulcerative gingivitis. Patient may also complain of a bad taste. Pregnancy and fatigue are associated with an increased occurrence of pericoronitis.<sup>6</sup> The radiographic appearance of the local bone can become more radiopaque in chronic pericoronitis.

## MICROBIAL FLORA

At the time of tooth development, as the dental follicle communicates with the oral cavity, it is said that bacterial colonization occurs into the follicular space leading to initiation of infection.<sup>6,7</sup> A bacterial species which are predominant in pericoronitis of erupting mandibular third molars are Streptococcus, Actinomyces and Propionibacterium species. Along with these, there is also an evidence of presence of  $\beta$ -lactamase producing bacteria such as Prevotella, Bacteroides, Fusobacterium, Capnocytophaga and Staphylococcus sp.<sup>8,9</sup> It is proven that the microbial flora of pericoronitis are predominantly anaerobic.<sup>10,11</sup> Pericoronal flap colonizes the same bacterial species which are seen in tonsillitis and periodontitis.<sup>12,13</sup> Leung et al found that microbiota of pericoronitis resembles that of gingivitis, periodontitis and detected *P. gingivalis* in 100% of the samples.<sup>14</sup> Rajasuo et al detected *P. gingivalis* in 9.1% of the samples<sup>12</sup> while Mombelli et al found in 20% of healthy third molar pericoronal pockets.<sup>11</sup> *A. actinomycetemcomitans* detected in pericoronal pockets found to be: 17-40% by Mombelli et al, 9.1% by Rajasuo et al and 10.8% by Peltroche-Llacsahuanga et al respectively.<sup>11,12,15</sup> *T. forsythia* also detected in pericoronitis samples. It is difficult to isolate periodontal pathogens by microbial culturing from the pericoronitis sites. So, Polymerase chain reaction (PCR) has been shown to be a highly specific and sensitive test for detection of periodontopathogens in pericoronal flap.<sup>16</sup>

## HISTOLOGICAL FEATURES

There is an evidence of presence of hyperplastic epithelial lining of pericoronal flap along with intercellular edema and infiltration of leukocytes. While connective tissue which is present underneath epithelium shows features like increased vascularity, dense diffused infiltration with both lymphocytes and plasma cells. There is also a presence of varying numbers of polymorphonuclear leukocytes within connective tissue of inflamed pericoronal flap.<sup>17</sup>

## COMPLICATIONS

Pericoronitis is a painful condition and can lead to more

serious problem if left untreated. If condition is localized then, it may convert into pericoronal abscess. It may spread posteriorly into the oropharynx and medially to the base of the tongue, hence there is presence of difficulty in swallowing. Depending upon severity of the condition, there is an involvement of the lymph nodes. It may be submaxillary, posterior cervical, deep cervical, and retropharyngeal group of lymph nodes. A chronic pericoronal infection may extend into a potential soft tissue spaces such as the sublingual space, submandibular space, parapharyngeal space, pterygomandibular space, infratemporal space, submasseteric space and buccal space. The sequelae of acute pericoronitis are peritonsillar abscess formation, cellulitis, and Ludwig's angina.<sup>1</sup> It may require hospitalization and can be a life threatening situation.

Ludwig's angina is characterized by fever, malaise, elevation of the tongue and floor of mouth due to sublingual space involvement, difficulty in swallowing, slurred speech and board like swelling of the submandibular space bilaterally involving the anterior neck eventually.<sup>6</sup>

Parapharyngeal abscess leads to fever and malaise, severe pain on swallowing, dyspnoea and deviation of the larynx to the one side. These conditions requires urgent surgical approach so that the airway can be secured along with draining and decompression of the affected tissue spaces.<sup>6,17</sup>

## MANAGEMENT

If the cause of pericoronitis is not eliminated, it may present as a recurrent condition which requires multiple episodes of treatment.<sup>7</sup> There are several factors on which treatment of pericoronitis truly depends. These are inflammation severity, the systemic complications and the advice of retaining or extraction of the involved tooth by the dentist depending on its prognosis. If there is presence of persistent symptomless pericoronal flaps, it should be removed as a preventive measure.<sup>1</sup>

The Royal College of Surgeons of England has given National Clinical Guidelines for the management of pericoronitis, as follows:

- Do irrigation of pericoronal space with warm water to gently flush the area so that food debris and exudate can be removed.<sup>1</sup> An irrigating solution should be sterile. It may include warm water for injection, normal saline, chlorhexidine solution and local anesthetic solutions.<sup>7</sup>
- Elevate the pericoronal flap gently from the tooth with scaler or curette and swab the underneath surface of flap with antiseptic.<sup>1</sup>
- Evaluation of occlusion should be done in order to determine if an opposing tooth is traumatizing with the pericoronal flap or not. If such condition present, then think of either removal of soft tissue or occlusal adjustment whichever may be necessary.<sup>1</sup>
- If the pericoronal abscess is evident, make an antero-posterior incision with a #15 blade to establish

drainage. Drainage may also be obtained by incising the flap with a bent-needle electrode.<sup>1</sup>

- Use local agents to cauterise the soft tissues.<sup>7</sup> Caustic agents such as chromic acid, phenol liquefactum, trichloroacetic acid or Howe's ammoniacal solution was used to control pain. It was placed under the operculum in small amount on cotton pellete. These will lead to rapid pain relief due to chemical cauterisation of the nerve endings of pain in the superficial tissues. A caution and appropriate care should be taken to avoid injury to adjacent tissues. But now a days, the use of these toxic chemicals in the oral cavity is no longer recommended.<sup>6</sup>
- In severe cases of pericoronitis or if systemic symptoms are present, advice antibiotics to the patient along with appropriate analgesics.<sup>1,7</sup> The use and choice of antibiotics is controversial. The microbiota of pericoronitis is complex mixture of gram-positive and gram-negative micro-organisms. So, broad spectrum of antibiotics or combinations of antibiotics should be given depending upon the clinical condition.<sup>7</sup> The antibiotic of choice is amoxicillin 500mg three times a day for five days in combination with metronidazole 400 mg three times a day for five days. To inhibit  $\beta$ -lactamase activity, amoxicillin and clavulanic acid 625 mg two times a day for five days should be given in combination with metronidazole 400 mg three times a day for five days. Those patients who are allergic to penicillin, erythromycin 500 mg four times a day for five days is suitable.<sup>6</sup>
- Ozone can also be used as a local antimicrobial agent. It is considered a useful adjunct in the treatment of pericoronitis. But there is no evidence present to show its efficacy till date.<sup>6</sup>
- Give oral hygiene instructions to the patient and advice 0.12% chlorhexidine mouthwash/ warm salt water rinse twice a day.

After resolution of the acute phase following line of treatment should be considered :

- The decision to retain or extract the tooth depends upon further eruption of tooth into a good functional position occurs or not. Extract partially or completely impacted third molars as early as possible during their developmental phase. So that there are less chance of bone loss occur on the distal surface of second molars. A problem will be greater if the third molars are extracted after the roots of tooth are formed.<sup>1</sup> It is one of the accepted criteria by the NIH (National Institute of Health of America) for removal of third molars. It is also considered as the commonest cited reason for removal of wisdom teeth in the UK. It is said that presence of third molar does not necessarily mean that the associated tooth requires removal.<sup>7</sup>
- If the decision is made to retain the tooth, in such cases, Operculectomy can done using periodontal knives or surgical scalpel, electrosurgery, lasers. A loop electrode can also be used to remove the flap. It

is advisable to create a cleansable site by the surgery. Remove the flap on the occlusal surface along with tissue distal to the tooth. A deep distal pocket will be left if only the occlusal flap is removed. These will lead to the recurrence of acute pericoronal inflammation. Appropriate oral hygiene instructions should be given to the patient in long-term maintenance.

## CONCLUSION

Though pericoronitis around third molar as a disease entity looks small but one cannot neglect its potential complications. Beside its local symptoms, this small inflammation can transform into localized abscess or can spread into adjacent soft tissue spaces leading to life threatening conditions if left untreated. A proper diagnosis should be made on the basis of thorough case history, clinical examination and radiographic assessment. Depending on the diagnosis, most appropriate treatment plan should be implemented on an emergency basis.

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