

Management of Chronic Pericoronitis of Lower Third Molars with Periodontal Operculectomy Surgical Approach (Case Report)

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ABSTRACT

Pericoronitis is an acute or chronic periodontal inflammation around the crown of a partially erupted mandibular third molar. A 24-year-old female patient came with a complaint of pain in the lower right lower back tooth for the past three months, disturbing her eating and making her feel uncomfortable. Extraoral examination revealed no abnormalities in the patient and intraoral examination revealed soft tissue covering the occlusal portion of tooth 48 which had partially erupted. Operculectomy was performed at region 48 using a scalpel and blade to eliminate pericoronitis. The prognosis in this case is good. Treatment results showed soft tissue healing within 1 month in accordance with the expected prognosis

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1. INTRODUCTION

Pericoronitis is an acute or chronic periodontal inflammation around the occlusal surface of a partially or completely erupted mandibular third molar. The operculum is the soft tissue covering a partially erupted tooth, whereas pericoronitis refers to inflammation of the soft tissue around the third molar, rarely elsewhere. The gap between the crown of the tooth and the overlying operculum is an ideal area for food impaction and bacterial growth. Even in patients without clinical signs or symptoms, the operculum is frequently inflamed and chronically infected.^{1,2}

The clinical picture of pericoronitis shows a red area, swelling, suppuration that is very painful when pressed, with pain that can radiate to the ears, throat, and floor of the mouth. The patient is very uncomfortable due to the pain and difficulty in closing the jaw. Extraoral examination revealed swelling of the cheek at the angle of the jaw and lymphadenitis. Patients may develop systemic complications such as fever, leukocytosis, and *malaise*. Acute pericoronitis is characterized by complaints accompanied by limited mouth opening and more severe symptoms so that the patient feels uncomfortable when opening his mouth. While the acute condition refers to patients who describe low-level pain that lasts a short time without significant signs and symptoms.^{2,3}

Pericoronitis occurs in the soft tissue around partially erupted third molars, it can also occur in orthodontic patients with mesioangular inclination of the third molars. The age range that occurs in this case is around 20 to 29 years, and it rarely occurs before the age of 20 or after the age of 40 years. Based on geographical conditions, urban residents are reported to be more susceptible to this disease. The habit of maintaining oral hygiene affects the occurrence of pericoronitis. Smokers are reported to be more prone to pericoronitis. The position of the mandibular third molars with a vertical angle and impacted teeth with class II position A were reported to have a higher prevalence rate.^{4,5}

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Operculectomy is a minor surgical procedure to remove the operculum or fold of tissue over a partially erupted tooth, especially the third molar. This procedure creates an area that is easy to clean, preventing plaque buildup and subsequent inflammation. Methods that can be used are scalpel (scalpel and blade), electrocautery, laser, historically with a caustic agent (trichloroacetic acid). Indications for operculectomy if there is space available for eruption of the third molar, harmonious alignment of the third molar in the arch with vertical angulation to the long axis of the second molar, presence and proper alignment of the opposing teeth. Another issue is if the third molar is to be used as a support for the fixed prosthesis, and the patient does not wish to undergo third molar extraction.⁶⁻⁸

Untreated pericoronitis may be localized in the form of a pericoronal abscess. If it occurs in a partially erupted vital tooth, it can lead to the formation of a cyst. It can also spread to the posterior, oropharyngeal area and medial to the base of the tongue, making it difficult for the patient to swallow. Depending on the severity, there is involvement of the submandibular, cervical, deep cervical, and retropharyngeal lymph nodes. Peritonsillar abscess formation, cellulitis, and Ludwig's angina are rare, but potentially sequelae of acute pericoronitis. Complications of periodontal surgical treatment include postoperative pain, bleeding, limited mouth opening, decreased masticatory function, and intraoral and extraoral swelling.^{9,10}

This case report aims to describe the clinical characteristics and management of pericoronitis cases chronic surgical approach with periodontal operculectomy.

2. METHOD

A 24-year-old female patient came to the Department of Periodontics of the General Achmad Yani University Hospital with complaints that the right lower back gums were disturbing when eating. The gums had been sore and swollen 3 months ago to the point where it bothered the patient while eating. Extraoral examination showed no abnormalities, while intraoral examination showed gums covering teeth 38 and 48 .partially erupted with tooth 48 slightly bucced to mandibular alignment, cheek biting on the right and left buccal areas, and gingival edema with bright red coloration in regions 26, 27, 37, 35, 34, 32, 31, 41, 42 (Figs 1 and 2). The results of routine blood investigations showed that it was within normal limits and the patient's panoramic photo showed 38 impacted class III teeth in horizontal position and 48 partially erupted in a vertical position (Fig. 3).



Figure 1. Extraoral photographs. (a) Front view, (b) Side view.
Excerpted from: Personal documentation.



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Figure 2. Intraoral photographs. (a) Upper jaw, (b) Lower jaw.
Excerpted from: Personal documentation.

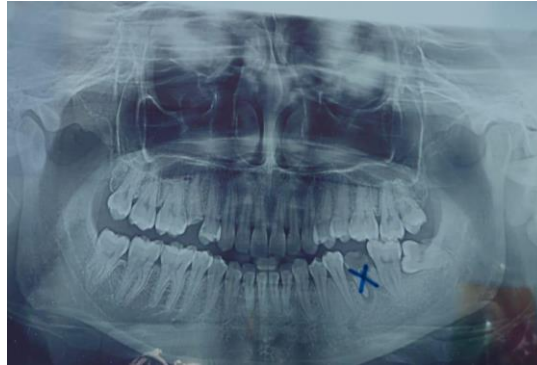


Figure 3. Panoramic photo.
Excerpted from: Personal documentation.

Based on the examination that has been carried out, the patient was diagnosed with gingivitis associated with dental plaque only with local contributing factors accompanied by pericoronitis. The treatment plan in the initial phase is scaling of the upper and lower jaws, giving instructions for oral hygiene in the form of brushing teeth using the bass method, cleaning the tongue, and giving oral hygiene instructions. Use additional aids with dental floss. Control 1 week and 1 month after scaling by re-examining the plaque score and gingival condition, as well as extraction of the remaining roots of teeth 15 and 36. The surgical phase was operculectomy in region 48 with conventional techniques using scalpel and blade, control 1 week and 1 month after operculectomy surgery. The restorative phase is the manufacture of denture bridges for teeth 15 and 36. The maintenance phase is carried out with regular visits to see the patient's oral hygiene and tissue healing.

Management carried out before operculectomy surgery is the preparation of tools and materials, operator preparation and patient preparation. Explain the purpose and goals of treatment and ask the patient for medical treatment approval. Patients were instructed to rinse their mouth with povidone iodine solution for 30 seconds before starting the procedure. The management of the operculectomy was initiated by performing aseptic and antiseptic procedures using povidone iodine and continued with Fisher's block anesthesia (Figure 4) and buccal infiltration in the 48th region using pehacaine, then a probing examination around tooth 48 (Figure 5) was performed. Further bleeding points were made using pocket markers around the buccal, distal and lingual gums surrounding the 48 region (Fig. 6). The scalpel was used with a modified pen grasp technique with finger rests on the teeth adjacent to the operating area. Excision was performed using a scalpel and blade No. 15. Place the blade 1 mm below the bleeding point in a coronal direction and at a 45 degree angle to the gingiva. The excision movements were sequentially started from the lingual, distal, and buccal teeth of 48 (Fig. 7). Ensure that the excised tissue is completely removed as expected. The next treatment was cleaning of plaque and calculus on tooth 48 using a manual scaler. Then irrigation using povidone iodine and control of bleeding by pressing tampons on the operculectomy area. Excision was performed using a scalpel and blade No. 15. Place the blade 1 mm below the bleeding point in a coronal direction and at a 45 degree angle to the gingiva. The excision movements were sequentially started from the lingual, distal, and buccal teeth of 48 (Fig. 7). Ensure that the excised tissue is completely removed as expected. The next treatment was cleaning of plaque and calculus on tooth 48 using a manual scaler. Then irrigation using povidone iodine and control of bleeding by pressing tampons on the operculectomy area. Excision was performed using a scalpel and blade No. 15. Place the blade 1 mm below the bleeding point in a coronal

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Figure 4. Fisher's block anesthesia and regional buccal infiltration 48.
Excerpted from: Personal documentation.



Figure 5. Probing at region 48.
Excerpted from: Personal documentation.



Figure 6. Determination of the bleeding point in the 48 region.
Excerpted from: Personal documentation.

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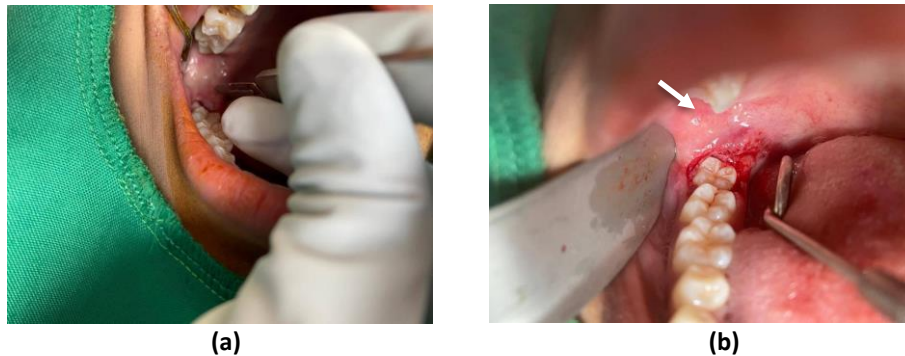


Figure 7. (a) Excision of region 48, (b) After operculectomy of region 48.
Excerpted from: Personal documentation.

The surgical area is then closed with a periodontal pack at region 48. A periodontal dressing or periodontal pack is placed over the surgical area as in an operculectomy to protect the surgical wound from the intraoral area and promote tissue repair during the first week of healing.

Postoperative pharmacology in the form of amoxicillin 500 mg, mefenamic acid 500 mg, and chlorhexidine gluconate 0.2%. Patients were instructed to follow up 1 week after the operculectomy procedure and to take medication as recommended. In addition, maintaining dental and oral hygiene such as cleaning teeth twice a day in the morning after breakfast and at night before going to bed with the charter method slowly at the surgical area and gargling with chlorhexidine gluconate to help maintain dental and oral hygiene. The operating area should be freed beforehand from chewing food, not playing the surgical site with the tongue or fingers, not sucking the operating area and asked not to rinse too hard.

Based on the results of the control 1 week after the operation, the patient complained of pain when chewing food which was characterized by a clinical picture of gingival edema around the 48th region and granulation tissue (Fig. 8). Debridement was carried out at the control for 1 week by irrigating the 48 region using povidone iodine. Then the control was returned for 1 month with the results showing that the gingival tissue had healed in the 48th region and was declared healthy (Figure 9).



Figure 9. Control 1 week post operculectomy.
Excerpted from: Personal documentation.



Figure 9. Control 1 month post operculectomy.
Excerpted from: Personal documentation.

3. RESULT AND DISCUSSION

Pericoronitis is an infection of the soft tissue around the crown of a partially erupted tooth that most commonly occurs in the mandibular third molars. Often found in adult patients and young adults, usually the third third molar erupts. Microflora that develops in the gap between the crown and operculum is reported to be the main cause of pericoronitis. Several studies have shown that the microflora associated with pericoronitis is anaerobic bacteria, namely *Streptococcus*, *Staphylococcus*, and *Fusobacterium* sp. Impacted food and plaque trapped in the gap between the crown and the operculum become a place for microflora to colonize, causing inflammation of the operculum. Trauma due to contact between the lower third molars and the fully erupted upper third molars can exacerbate inflammation which can lead to enlargement of the operculum due to inflammatory fluid and cellular exudate so that jaw closure becomes incomplete. Chronic pericoronitis is caused by trauma to the soft tissue covering the occlusal surface of partially or completely erupted mandibular third molars. Can occur as a result of trauma by the cusp of antagonistic third molars that occur repeatedly and in the long term. Symptoms that arise are characterized by dull pain for several days and recur within months. Chronic pericoronitis is caused by trauma to the soft tissue covering the occlusal surface of partially or completely erupted mandibular third molars. Can occur as a result of trauma by the cusp of antagonistic third molars that occur repeatedly and in the long term. Symptoms that arise are characterized by dull pain for several days and recur within months. Chronic pericoronitis is caused by trauma to the soft tissue covering the occlusal surface of partially or completely erupted mandibular third molars. Can occur as a result of trauma by the cusp of antagonistic third molars that occur repeatedly and in the long term. Symptoms that arise are characterized by dull pain for several days and recur within months.^{11,12}

The etiology of the patient was that there was soft tissue covering part of tooth 48 which partially erupted so that it became a place for food impaction and was exposed to pressure due to antagonistic teeth during chewing which caused inflammation. The inflammatory process in pericoronitis begins with damage to soft tissue caused by bacterial lipopolysaccharide, so that immune cells from the body go to the soft tissue around the infected tooth. Several proinflammatory mediators such as interleukins, TNF-alpha, TGF, and NGF also play a role in the occurrence of pericoronitis. Tumor Necrosis Factor-alpha signals the TNFR-1 and TNFR-2 receptors on nerve ending nociceptors by activating the protein kinase-C enzyme so that the Na⁺ pump opens which can cause an action potential. These action potentials will cause pain in patients with pericoronitis. Other mediators that also play a role are COX-2, caspase-1 and IL-17.^{13,14}

Before performing periodontal surgery, it is necessary to evaluate the patient's medical history. Patients also underwent routine blood tests which were considered as part of the pre-anesthesia evaluation to determine the feasibility of anesthesia and identify patients at high risk of postoperative complications. Surgery is contraindicated in patients with ASA III-IV status. Patients with these conditions need to be consulted first formerly with physicians treating patients and specialists in oral

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medicine. Kedua is evaluation oral hygiene which can have an effect on postoperative wound healing and affect the stability of the outcome of surgery in the long term. Furthermore, evaluation of the patient's bad habits, smoking can affect the healing of postoperative periodontal tissue, consuming alcohol and drugs can decrease the patient's level of cooperation and the success of treatment.¹⁵⁻¹⁷

Operculectomy is a surgical procedure performed on the soft tissue around an impacted or partially erupted tooth. Operculectomy can prevent food impaction and plaque around impacted or partially erupted teeth so as to reduce inflammation. There are several excision methods that can be used in operculectomy, namely excision of the operculum with conventional methods using a scalpel and blade, laser and electrocautery methods, and caustic agents. Excision of tissue with a scalpel and blade results in excessive bleeding and can impair visibility of the operating area, and may increase patient anxiety prior to surgery. The advantages of conventional methods are that they are cheaper and more effective. The laser method is a method with a lower invasive rate compared to conventional methods. This is due to less cellular damage and bleeding, thus providing better visibility and a clear and clean operating area, as well as a shorter procedure time when using a laser (Figure 10). Based on clinical studies, it is reported that the diode laser is a better choice than conventional methods due to its lower postoperative pain degree, faster elimination of pericoronitis symptoms, better soft tissue healing, and the hemostatic properties of the laser that allow better visibility of the operative area. better.¹⁸⁻²⁰



Figure 10. Laser operculectomy.
Quoted from: Arif KM et al.²⁰

Electrocautery It has been widely used in several minor surgical procedures such as dermatology, plastic surgery and urology. This method uses electrodes that can generate heat. The heat can cause tissue damage and blood clots. Contraindicated in patients taking pacemakers and having poor wound healing, diabetes or bleeding disorders. The benefits of this tool can cut tissue well, accelerate hemostasis, minimal tissue damage, and the resulting wound is painless when compared to using a scalpel (Figure 11). The use of caustic agents such as chromic acid, phenol liquefactum, trichloroacetic acid or ammonia solution can also be used as chemical cauterization of pain free nerve endings. However,^{21,22}



Figure 11. Operaculectomy with electrocautery.
Quoted from: Asok et al and Bharali et al.^{18,21}

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Periodontal tissue wound healing includes four phases including the hemostasis phase, the inflammatory phase, the granulation phase, and the maturation phase. Immediately after surgery, immune cells will penetrate the capillary walls, and bring blood to the connective tissue that contains factor-factor to activate platelets or initiate coagulation. Almost concurrent with coagulation, and peaks 12 to 24 hours after operation, inflammation to develop state it is usually destination to clear bacteria and damaged cells from the wound, and allow the normal development of wound healing. If infected wound, wound healing will be delayed due to inflammation will interfere with the deposition of extracellular matrix and prevent the normal function of connective tissue cells. In periodontal surgery, postoperative infection usually becomes apparent within the first few days after surgery, kBecause increasing pain severity is an early sign of inflammation, recommended to me control patients 1 to 2 days after periodontal surgery through phone call. Once the wound is free of bacteria, cells such as keratinocytes, fibroblasts, and endothelial cells will try to heal migrate into and over the wound. Keratinocytes from the surrounding wound edges migrate over the wound surface. Fibroblasts migrate into the wound. Endothelial cells of the surrounding capillaries grow in response to hypoxia in the center of the blood clot, and by VEGF produced by fibroblasts. Granulation tissue is usually dark red in color because it contains many capillaries, and is brittle. Periodontal soft tissue experience maturation within 6 to 8 weeks, produces a characteristic pink gingiva as the blood vessels are reduced in number and the epithelium attains a normal thickness. JThe number of fibroblasts in the mature connective tissue decreases and the original collagen fiber network increases one.²³⁻²⁵

4. CONCLUSION

Pericoronitis is inflammation of the operculum that often occurs in erupting lower third molars. Operculectomy is an action performed in cases of pericoronitis. The management of operculectomy in cases of pericoronitis needs to be done carefully, namely by paying attention to the anatomical position of the lower third molar and the surrounding tissue. In this case report, operculectomy in the 48th region used a conventional method with a scalpel and blade. Controls at 1 week and 1 month in patients showed healing of the gingival tissue which was pink and had a spongy consistency. The surgical outcome of operculectomy was in line with the expected prognosis.

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