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Where Science Meets Specimen – Importance of Evaluating Cellular Revelation

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Abstract

Pericoronitis is a common inflammatory condition associated with the soft tissues surrounding the crown of a partially erupted tooth, most frequently involving mandibular third molars. It occurs due to the accumulation of food debris under the operculum, the overlying gum tissue. If left untreated, it may lead to chronic infection and complications affecting adjacent structures. Operculectomy, the surgical removal of the operculum, is a definitive treatment option in recurrent or chronic cases.

A 21-year-old male presented with pain in the right lower posterior region. Clinical examination revealed inflammation of the operculum overlying tooth #48 and caries in tooth #47. Radiographic evaluation showed an unerupted tooth #48 and deep caries involving the pulp chamber of #47. In the initial phase of treatment, the patient underwent oral prophylaxis and was educated on oral hygiene maintenance. An inferior alveolar nerve block was administered using 2% lignocaine with 1:80,000 adrenaline prior to surgical intervention. Operculectomy was performed using a No. 12 blade with excision from the buccal, distal, and lingual aspects. The inflamed opercular tissue was removed, followed by debridement, scaling, and irrigation with 2% chlorhexidine gluconate and saline. The excised tissue was sent for histopathological examination. Postoperatively, the patient was prescribed antibiotics, analgesics, and chlorhexidine mouthwash. On the 7-day follow-up, the surgical site showed satisfactory healing, and no symptoms were reported. Subsequently, root canal treatment was completed on tooth #47. Histopathological analysis confirmed chronic inflammatory changes.

Conclusion: This case emphasizes the need for a biopsy as a proper diagnostic tool for the management of pericoronitis along with conventional surgical intervention. The biopsy performed after the operculectomy is of great value for the histopathological information that is so rarely available in the literature.

Keywords: Pericoronitis, Operculectomy, Mandibular third molar, Root canal treatment, Chronic inflammation, Histopathology

Introduction

Operculectomy is a minor surgical procedure aimed at removing the operculum or tissue flap covering a partially erupted tooth. This procedure can be carried out using a surgical scalpel, electrocautery, or LASER technology. Pericoronitis refers to the inflammation of the gum tissue surrounding the crown of a tooth that has partially erupted. The inflammatory reaction associated with pericoronitis stems from the buildup of debris and bacteria in the pericoronal pocket of an erupting or impacted tooth.[1] Factors that may contribute to the development of pericoronitis include a partially erupted tooth crown or a pocket surrounding the tooth's crown, overlapping opposing teeth, and inadequate oral hygiene.[2]

The primary cause of pericoronitis is the accumulation of food trapped beneath the operculum. During eating, food particles can gather in the pseudopocket located between the operculum and the impacted tooth. This unable-to-clean pocket allows bacteria to thrive and leads to the development of pericoronitis. The microbial community, such as red complex bacteria present in pericoronitis, resembles that found in periodontal pockets. These bacteria incite inflammation in the pericoronal region. Furthermore, trauma from opposing teeth can worsen pericoronitis. Additionally, factors such as stress, smoking, and respiratory infections can also aggravate the condition.[3]

Pericoronitis can be categorised into two types: acute and chronic. Symptoms of acute pericoronitis include discomfort, swelling, sensitivity, and pulsating pain, which may radiate to the ear and the temporomandibular joint. If the discomfort lasts for a day or two and is followed by a dull ache over several months, it indicates chronic pericoronitis. The approach to treating pericoronitis consists of both conservative and definitive methods. Conservative treatment involves rinsing beneath the operculum to eliminate debris and inflammatory discharge, as well as smoothing the prominence of the opposing tooth.[4]

While definitive treatment includes extraction and operculectomy of teeth experiencing pericoronitis. Pericoronitis will cause complications in the form of pericoronal abscess, spread of infection posteriorly to the oropharyngeal area and medial base of the tongue; patients have difficulty swallowing. It occurs if no treatment is performed. The severity and extent of infection influence the involvement of the submaxillary, posterior cervical lymph nodes, deep neck, and retropharyngeal.[5] The aim of this study was to describe the management of pericoronitis treatment with conventional surgery. The definitive treatment involves the extraction and operculectomy of teeth affected by pericoronitis.[5] The purpose of this study was to outline the therapeutic effect of conventional surgical methods for the management of pericoronitis with the help of biopsy as a diagnostic tool. This case report is distinctive as post-operculectomy biopsy provides an insight into the histopathological profile of tissue, which marks as an excellent diagnostic tool to understand the progression of the lesion.

Case Report

A. Chief Complaint

A 21-year-old male patient reported with a chief complaint of pain in the lower right back tooth region.

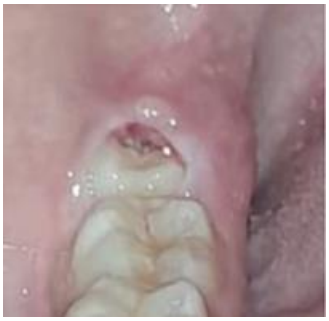

Figure 1: Clinical representation of an inflamed operculum

B. History:

The patient has complained of continuous throbbing pain in the lower right back tooth region since a week. No relevant medical history reported.

C. Clinical Features:

On clinical examination, dental caries was observed in tooth #48 (right mandibular third molar), with suspected pulpal involvement of tooth #47 (lower right second molar). Red inflamed tissue and swelling of the operculum overlying tooth #48 are observed.

D. Radiographic Features:

- Intraoral periapical radiograph (IOPA) revealed that tooth #48 was unerupted.
- Tooth #47 showed caries extending into the pulp chamber, confirming pulpal involvement.

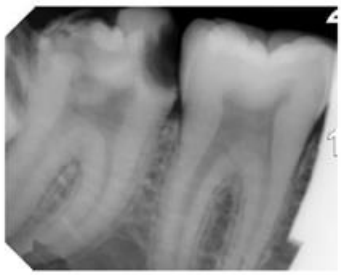

Figure 2: Radiographic Revealing Decayed #47, Impacted #48

E. Diagnosis

- Chronic irreversible pulpitis i.r.t 47
- Periocoronitis with partially erupted tooth i.r.t 48.
- The overall prognosis of the procedure is expected to be good.

F. Treatment Plan

The treatment was planned in two phases:

1. Initial Phase

- Full-mouth scaling.
- Oral hygiene instructions and dental health education.
- Root canal treatment (RCT) planned for tooth #47.

2. Surgical Phase

- **Surgical operculectomy over tooth #48**

Surgical Procedure of Operculectomy

The operculectomy was performed aseptically. Local anaesthesia was achieved through administration of an inferior alveolar nerve block, along with long buccal and lingual nerve infiltration, using 2% lignocaine with 1:80,000 adrenaline.

Bleeding points were initially created with UNC 15 Probe on the operculum to assist in defining the surgical margins. Operculectomy with a No. 12 surgical blade was initiated. An incision along the:

- Buccal aspect of the operculum extending in the distal direction,
- Lingual extent while maintaining the adjacent soft tissues.

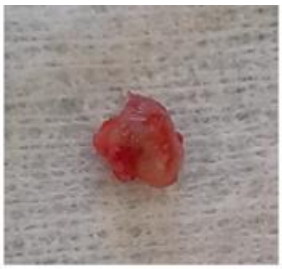

Figure 3: Excisioned operculum

After the incisions were made, the inflamed operculum as a flap was removed, which revealed the crown of the underlying partially erupted tooth. We ensured the inflammatory opercular soft tissue flap was completely

removed to prevent the recurrence of pericoronitis. After excision, the surgical site was well-done and during the procedure. Scaling and curettage were done to remove all plaque, calculus, and inflammatory granulation tissue from the surrounding gingiva areas and tooth surfaces. The site was then irrigated with 2% chlorhexidine gluconate and then normal saline to ensure complete cleansing of the surgical area. This would decrease the risk of postoperative infection.

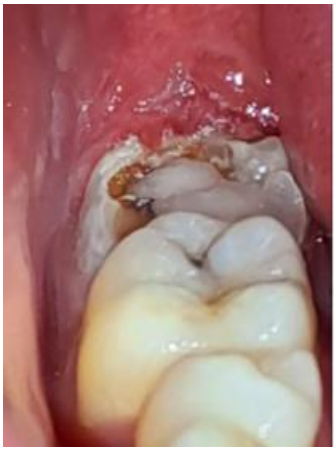

Figure 4: Immediate Post-op

Postoperative Instructions and Medications

The patient was given:

- Amoxicillin 500 mg, three times per day, five days.
- Mefenamic acid 500 mg, as needed for pain control.
- 0.12% chlorhexidine gluconate mouthwash (2 times per day).

The patient was instructed to maintain strict oral hygiene and to avoid trauma in the surgical area. Follow-up was arranged in 7 days to assess healing (in this instance, however, no sutures were needed). The excised tissue was fixed in 10% formalin and sent for histopathological analysis, and the diagnosis of a chronic inflammatory lesion was confirmed.

Biopsy and Histopathological Evaluation

The oral biopsy specimen consisted of a grey-white soft tissue fragment measuring 0.7 x 0.5 cm. Microscopic examination revealed tissues lined by stratified squamous epithelium. Subepithelial zone revealed dense lymphocytic infiltrate without granulomas and atypia. Histopathological impression of a chronic inflammatory lesion correlated clinically and radiologically.

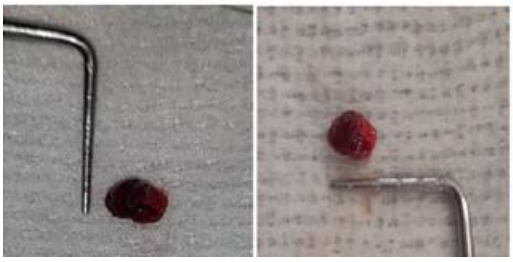

Figure 5 and 6: Measuring of the Oral biopsy specimen

Figure 7: Biopsy report generated by the lab.

Discussion

Operculectomy is a common minor surgical intervention for the treatment of chronic or recurrent pericoronitis, especially associated with mandibular third molars. Even though the clinical presentation of pericoronitis is usually uncomplicated and, in turn, managed clinically, the consideration of histopathological examination of the excised opercular tissue is routinely neglected in dental practice. In this case, the opercular tissue was surgically removed and sent for histopathological analysis, which revealed a chronic inflammatory lesion characterised by stratified squamous epithelial lining and dense

subepithelial lymphocytic infiltration, with marked intracellular oedema and leukocytic infiltrate with no evidence of granulomas or atypia. The connective tissue shows increased dense inflammatory cell infiltrates, with numerous polymorphonuclear leukocytes were seen with the inflamed connective tissue of the pericoronal flap. This histological picture correlates well with chronic pericoronal inflammation and supports the initial clinical diagnosis. However, it also reinforces the need to confirm such cases microscopically, as many lesions that appear benign clinically may harbour significant underlying pathology.

Many reports document the need to histologically evaluate excised pericoronal or opercular tissues. A landmark study by Adelsperger et al. (2000)[7] examined 2,646 pericoronal follicles and revealed that 30% had some pathological changes, including cystic degeneration, ameloblastomas, or other odontogenic tumours, even in asymptomatic patients. Saravana and Subhashraj (2008)[6] evaluated pericoronal tissues and found that 58.65% had pathological changes, emphasising that clinical benignity does not necessarily signify the absence of serious pathology. The aforementioned reviews strongly advocate for histological evaluation of pericoronal or opercular tissues as a matter of routine—especially in persistent or recurrent inflammation. Furthermore, histopathological examination is essential in differentiating simple chronic inflammation from pathologic processes with premalignant or neoplastic potential (e.g., epithelial dysplasia or early carcinoma) that could significantly influence treatment and prognosis [10]

In this case, the biopsy report proved to be incredibly valuable for diagnosis. The lack of atypical cells and granulomatous features helped eliminate the possibility of more serious conditions. It also confirmed the choice to move forward with surgical excision as part of the treatment plan. By combining surgical operculectomy with the biopsy, we gained a thorough understanding of the lesion, which further supported the prognosis. While the usual treatment for pericoronitis often involves antibiotics, improving oral hygiene, and sometimes extraction, a more careful yet thorough approach includes operculectomy followed by a histopathological assessment. This is especially relevant for young adults, where preserving the third molar might be an option worth considering. The surgical procedure itself, involving the use of a No. 12 blade with incisions along the buccal, distal, and lingual aspects, followed by debridement and irrigation with 2% chlorhexidine gluconate and saline, provided mechanical removal of the chronically inflamed soft tissue and reduced the bacterial load. This not only resolved the local infection but also improved access for oral hygiene, reducing the chance of recurrence.

The histopathological evaluation of excised tissue adds a crucial diagnostic layer that clinical assessments alone simply can't provide. Research has demonstrated that pairing surgical treatment with microscopic diagnosis yields the best results for managing recurrent or chronic soft tissue lesions in the oral cavity. For instance, a study by Almendros-Marqués et al. (2006)[8] highlighted that the histopathological findings in pericoronal tissues often differ from what clinicians might expect. Ignoring these tissues could lead to missed diagnoses of odontogenic cysts or tumours.

Another important factor to consider is how we reassure patients and protect ourselves legally. When we confirm that a patient has a benign inflammatory process through histology, it not only boosts their confidence in the quality of care they're receiving but also acts as a record that we've followed all the necessary diagnostic steps. If

a patient later develops an issue in the same area, the previous histopathology can be a valuable reference point. So, incorporating histopathological analysis into routine oral surgeries, like operculectomy, holds both clinical and ethical significance. Furthermore, from a research and epidemiological perspective, such evaluations help in understanding the spectrum and progression of pericoronal pathologies in different populations.[9]

The current case adds to the growing collection of research that advocates for a combined strategy—removing inflamed tissue surgically while also examining it histopathologically—to achieve a more accurate diagnosis and better management of pericoronitis. While pericoronitis is often seen as a minor dental issue, its chronic or recurring forms can have a significant effect on oral health, the vitality of nearby teeth, and the overall quality of life for patients. As shown, operculectomy paired with microscopic analysis provides a more comprehensive and evidence-based approach to handling these cases.

Conclusion

Within the limitations of the present study, it is observed that having an accurate diagnosis can determine not only the treatment plan but also rule out other histopathological factors that might cause inflammation of the operculum in the third molar region. Future case series and retrospective studies could bolster the case for implementing standard protocols that include histopathological assessments following operculectomy, which would help in the early detection of unexpected pathologies and ultimately improve patient care.

References

1. EP Ramadhany, 'Chronic Pericoronitis Management with Operculectomy using Surgical Scalpel' (2022) 18(1) Interdental Journal of Dental Medicine (IJKG).
2. Eka Pramudita Ramadhany, Media Sukmalia Adibah and Putu Fenti Surya Pratami DS, 'Chronic Pericoronitis Management with Operculectomy Using Surgical Scalpel' (2022) 18(1) Interdental Journal of Dentistry.
3. RP Dhonge, RM Zade, V Gopinath and Amirisetty, 'An Insight into Pericoronitis' (2015) International Journal of Dental and Medical Research 171–175.
4. Miloni Suresh Shah et al, 'Quantification of Operculectomy Procedures Performed Using Laser Versus Surgical Methods – An Institutional-Based Study' (2021) 13(1) International Journal of Pharmaceutical Research.
5. C Wehr, C Gianncarlo, Y Simon and Walid, 'An Insight into Acute Pericoronitis and the Need for an Evidence-Based Standard of Care' (2019) Dentistry Journal https://www.ncbi.nlm.nih.gov/ pmc/articles/ PMC67844.
6. G Saravana and K Subhashraj, 'Cystic Changes in Dental Follicle Associated with Radiographically Normal Impacted Mandibular Third Molar' (2008) 46(7) British Journal of Oral and Maxillofacial Surgery 552–553.
7. J Adelsperger, JH Campbell, DB Coates, DJ Summerlin and CE Tomich, 'Early Soft Tissue Pathosis Associated with Impacted Third Molars Without Pericoronal Radiolucency' (2000) 89(4) Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology 402–406, doi:10. 1016/s1079-2104(00)70119-3.
8. N Almendros-Marqués, L Berini-Aytés and C Gay-Escoda, 'Influence of Lower Third Molar Position on the Incidence of Preoperative Complications' (2006) 102(6) Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology 725–732, doi: 10.1016/j.tripleo.2006.01.006.

9. VS Kotrashetti, AD Kale, SS Bhalaerao and SR Hallikeremath, 'Histopathologic Changes in Soft Tissue Associated with Radiographically Normal Impacted Third Molars' (2010) 21(3) Indian Journal of Dental Research 385–390.
10. AS Manchanda MDS, RS Narang MDS and KK Sandhu BDS, 'Pathological Changes in Soft Tissues Associated with Radiographically Normal Impacted Teeth: A Critical Update and Meta-Analysis' (2025) 91(1) The New York State Dental Journal 8.