UDC: 616-006.2-079.4
Professional paper

SIMILARITIES AND DIFFERENCES BETWEEN FOLLICULAR CYSTS AND RADICULAR-INFLAMMATORY CYSTS

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Abstract

Odontogenic cysts are common jaw cysts of different etiologies and treatments. In our project we presented two case reports. The first is a radicular cyst with inflammatory etiology and a follicular cyst from developmental etiology. Our first patient was presented with a unilocular radiolucency cystic formation in a non-vital tooth (35), in the mandibular premolar region, which was suggestive of a radicular cyst. The second patient was presented with a radiolucent lesion associated with an unerupted mandibular third molar (48) that was diagnosed as a follicular cyst. These two lesions both showed buccal cortical expansion but none of them had signs of acute inflammation or any neurological symptoms. Enucleation surgical procedure was performed under local anesthesia in both cases, with mucoperiosteal flap elevation and also osteotomy. Excision of the cyst was made by Partsch II surgical method, which included enucleation, curettage and also irrigation of the bony cavity. Postoperatively were administered antibiotic therapy and antistreptolysin prophylaxis. After one week was made follow-up which revealed uneventful healing in both our cases, with no signs of any complication or recurrence. These cases emphasize the role of proper diagnosis on the basis of clinical and also radiographic examination. Even these cysts are radiographically similar, radicular and follicular cysts differ in etiology, pathogenesis and dental findings. The surgical method that we used - Partsch II was successful for both lesions. Also it is very important treatment in the early stages for better outcomes and to avoid recurrence of the cystic formations.

Keywords: Radicular cyst, follicular cyst, dentigerous cyst, odontogenic cyst, Partsch II operation, enucleation, mandible

1. Introduction

Odontogenic cysts are benign formations, whose origin is from epithelial remnants of tooth development. These are inflammatory or developmental cysts that represent a vast majority of oral pathology that clinicians encounter. Radicular cysts and follicular cysts (which are frequently referred to as dentigerous cysts) are some of the most prevalent odontogenic cysts being diagnosed (Borghesi et al., 2018). These two cysts, although both are radiographically similar, possess distinct underlying etiologies, clinical features, and treatment approaches and hence a definitive diagnostic procedure is necessary to implement proper treatment depending on histopathological findings.

Radicular cysts are most linked with the apex of non-vital teeth and are presented as a result of chronic inflammation process. From our review with simple cases as ours, it is thought that the proliferation of the epithelial rests of Malassez, remnants of Hertwig's epithelial root sheath, can lead to the development of these odontogenic cysts. The most common odontogenic cysts are radicular cysts and they typically occur in the adults, most commonly in the second and third period of life (Gurav et al.,2024). From radiographical perspective, they can appear as well-circumscribed and unilocular radiolucencies mostly at the root apex of the non-vital teeth with the size being related proportional to the duration of chronic inflammation process (Chen et al., 2018). From the clinical perspective, the patients are mostly asymptomatic or may have mild edema and pain.

Follicular cysts on the other hand, are of developmental origin and typically occur in association with an unerupted tooth, most commonly with the mandibular third molars or maxillary canines (Kammer, Mello & Rivero, 2020). They are often discovered incidentally upon routine radiographic examination during the evaluation of delayed eruption. The follicular cyst encloses the crown of the unerupted tooth and develops from the reduced enamel epithelium. Multifollicular mostly are benign cysts, they can displace adjacent teeth and, in some cases, lead to complications such as tooth malposition or even neoplastic transformation into more aggressive tumors such as ameloblastoma (Alqadi et al., 2023).

Even though these cysts are with different etiologies, they are similar on radiographic examination, often presented as unilocular, radiolucent cyst with well corticated borders. The morphological similarity is a diagnostic challenge, and requires correlation between clinical, radiographic and histopathological results for the definitive diagnosis (Singh et al., 2024). It is essential to distinguish between these two lesions as their treatment, prognosis, and management differ significantly.

The aim of this paper is to contrast our two clinical cases of radicular and follicular cysts that were managed with the Partsch II surgical procedure. Nonetheless, the surgery, histopathology and postoperative outcomes are reported with an emphasis on the diagnostic and therapeutic aspects that guided the management of each case.

2. Methods and Results

For this study were used two sample of odontogenic cysts, both having distinct clinical and radiographic presentations typical of radicular and follicular cysts, respectively. Both of our patients were managed with the same surgical intervention method (Partsch II) under local anesthesia, with uneventful healing and very satisfactory outcomes.

2.1 First patient with radicular cyst: Our first patient was 20-year-old and presented with the complaint of swelling in the left mandibular premolar region. On clinical examination, there was a hard, non-tender swelling in the area of tooth thirty-five, which was found to be non-vital on pulp testing. The patient did not report any strong pain, fever or signs of acute infection, which suggested us of a chronic inflammatory process. From the radiographical aspect, a panoramic radiograph showed us a well-defined, unilocular formation at the apex of tooth thirty five, which was suspected as a radicular cyst. This lesion is characterized with a chronic periapical inflammation that did not extend beyond the root apex and was without displacement of the surrounding teeth or other associated complications.

Figure 1

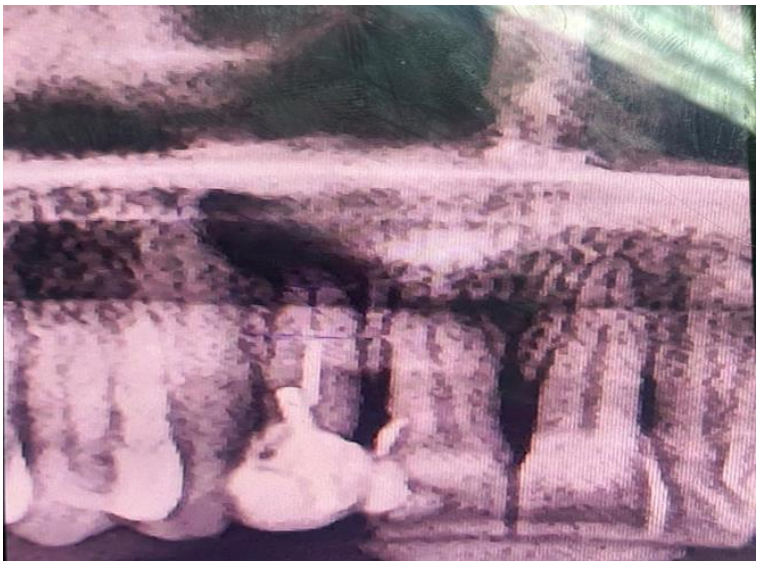

Figure 2

Figure 3

Figure 1, Figure 2 and Figure 3 are radiographic presentation of the radicular cyst. The unilocular radiolucency is seen at the apex of the non-vital tooth thirty five, as expected in a radicular cyst. The lesion is well-defined with a corticated border, suggesting a chronic inflammation.

Depending on the diagnosis, the patient underwent surgical intervention - enucleation of the cyst, under local anesthesia. To expose the lesion a mucoperiosteal flap was elevated and a careful osteotomy was done to reach the cystic cavity. By the Partsch II method, the cyst lining was enucleated carefully, and the cavity was irrigated with sterile saline to prevent postoperative infection. The wound after procedure was closed with sutures and postoperatively to the patient were prescribed antibiotics and symptomatic medication. The diagnosis was confirmed from the histopathological results, which was characterized with a non-keratinized stratified squamous epithelial lining and chronic inflammatory cells, characteristics for radicular cysts.

*Figure 4***.** The material removed from the radicular cyst

The patient made control one week after surgery and the final control was made a month after surgery. At each follow-up, after one week and the other after one month, the patient presented no infection or related complications and also with we proved the success of the surgical intervention which revealed complete bone fill within the cystic cavity.

2.2 Second patient with follicular cyst: The second patient, a 16 year old patient presented with a complaint of delayed eruption of the mandibular third molar with edema at the posterior right mandible, which was slight. From the clinical examination we revealed buccal cortical expansion over the area of the mandibular third molar (tooth forty eight) but without inflammation or signs of acute inflammatory process.

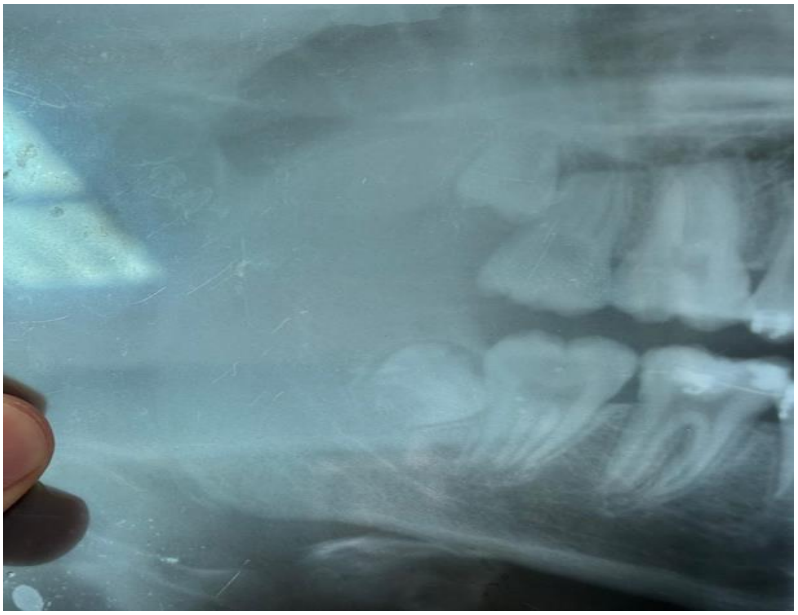

Figure 5. Radiograph of a follicular cyst, showing a well-defined radiolucency surrounding the crown of the unerupted mandibular third molar

Radiographically, we made an orthopantomogram which gave us picture of a well-defined radiolucency surrounding the crown of the unerupted mandibular third molar, which was indicative of a follicular cyst. The lesion presented was unilocular and appeared to be confined to the region around the crown, with no cortical perforation or even tooth displacement apparent. From the radiographic image there was no any pathological involvement of the surrounding bone, which indicated that the lesion was localized and non-invasive.

Figure 6. The material of **excised follicular cyst material, showing the cyst with reduced enamel**

After diagnosis the patient was scheduled for enucleation intervention under local anesthesia. A mucoperiosteal flap was used to approach the cystic lesion and also an osteotomy was created to gain adequate access. With the Partsch II method, the cyst was enucleated meticulously from the bone, and with the aim to remove any residual epithelium was performed a curettage. The cystic cavity was irrigated and also the flap was repositioned and sutured. Histopathological examination confirmed the diagnosis of a follicular cyst, showing a thin, uniform epithelial lining with reduced enamel epithelium, which is typical of the follicular cyst. To the patient was

administered antibiotic therapy postoperatively, and with instructions to use a chlorhexidine mouthwash for oral hygiene.
Follow up was made after one week and another control after one month. The patient had uneventful healing, with no infection, signs of recurrence or others complications were observed. Also follow-up radiographical images demonstrated complete bone fill of the cystic cavity, which also supported the favorable intervention outcome. The surgical operation was successful in completely removing the cystic lesions, and also bone regeneration was obtained without the need for any other interventions.

3. Discussion

Differential diagnosis of radiolucent jaw processes in the young, among others, includes radicular cysts, follicular cysts, odontogenic keratocysts, and also ameloblastomas.
It is very necessary to differentiate between these cysts in order to ensure adequate management (Cserni et al., 2020). Radicular cysts, resulting from chronic inflammation due to non-vital teeth, are associated with clinical signs of edema and pain but with less likelihood of resulting in significant tooth displacement. On the other hand, follicular cysts are typically detected incidentally during orthodontic assessment or examination for tooth eruption delay and try can lead to the displacement of adjacent teeth. The Partsch II operation technique is a well-established method for the enucleation of most odontogenic cysts, including follicular and radicular cysts. Surgical operation is a definitive treatment that removes the entire cyst, thus avoiding recurrence and the need for further intervention (Kaygisiz & Karsli, 2024). From the procedures, enucleation is preferred over marsupialization, which may retain cyst remnants, thus the possibility of recurrence is higher.
In both our reported cases, enucleation proved to be very successful surgical procedure in eradicating the cysts and also preserving the integrity of adjacent structures, including structures like the inferior alveolar nerve and also the adjacent teeth. The absence of complications from these operations demonstrates us that there is indicative of the success of this surgical technique and also adequate postoperative management (Safari et al., 2020).

4. Conclusions

From our comparative analyzes of these two cases of cysts, radicular and follicular, we emphasize the importance of detailed and accurate clinical, radiographic and also histopathological examination for effective diagnosis, management and treatment.
Even these cysts are nearly identical radiographically, the etiology, pathogenesis, clinical characteristics and surgical management of both cysts are very different. Radicular cysts are inflammatory in origin, often arising from chronic inflammation of non-vital teeth, in contrast, follicular cysts are developmental cysts that involves the crown of unerupted or impacted teeth Enucleation using the method of Partsch II was effective procedure in both our cases, presented with good postoperative outcomes and without signs of recurrence. Proper postoperative care using antibiotics, symptomatic pain therapy and regular follow up at our clinic, played an important role in promoting healing and preventing further complications. Early and proper intervention, reduces the chances of recurrence of the process and results in optimal healing. These cases highlight the importance of accurate diagnosis and early intervention in odontogenic cyst management.

References

[1] Alqadi, S., Jambi, S. A., Abdullah, A. A. B., Aljuhani, F. M., & Elsayed, S. A. (2023). Conservative Management of Dentigerous Cysts Associated With Mixed Dentition: A Retrospective Cohort Study. *Cureus*, *15*(10), e47143. https://doi.org/10.7759/cureus.47143

[2] Borghesi, A., Nardi, C., Giannitto, C., Tironi, A., Maroldi, R., Di Bartolomeo, F., & Preda, L. (2018). Odontogenic keratocyst: imaging of a benign lesion with an aggressive behaviour. *Insights into imaging*, *9*(5), 883–897. https://doi.org/10.1007/s13244-018-0644-z

[3] Chen, J. H., Tseng, C. H., Wang, W. C., Chen, C. Y., Chuang, F. H., & Chen, Y. K. (2018). Clinicopathological analysis of 232 radicular cysts of the jawbone in a population of southern Taiwanese patients. *The Kaohsiung journal of medical sciences*, *34*(4), 249–254. https://doi.org/10.1016/j.kjms.2018.01.011

[4] Cserni, D., Zombori, T., Vörös, A., Stájer, A., Rimovszki, A., Daru, K., Baráth, Z., & Cserni, G. (2020). A Clinicopathological Approach to Odontogenic Cysts: the Role of Cytokeratin 17 and bcl2 Immunohistochemistry in Identifying Odontogenic Keratocysts. *Pathology oncology research : POR*, *26*(4), 2613–2620. https://doi.org/10.1007/s12253-020-00866-4

[5] Gurav, T., Sontakke, P., Thakare, A., Reche, A., & Solanki, D. (2024). The Surgical Management of a Radicular Cyst in the Maxillary Anterior Region - A Case Report. *Cureus*, *16*(4), e59216. https://doi.org/10.7759/cureus.59216

[6] [6]. Kammer, P. V., Mello, F. W., & Rivero, E. R. C. (2020). Comparative analysis between developmental and inflammatory odontogenic cysts : retrospective study and literature review. *Oral and maxillofacial surgery*, *24*(1), 73–84. https://doi.org/10.1007/s10006-019-00816-8

[7] Kaygisiz, Ö. F., & Karsli, E. D. (2024). Evaluation of cyst treatment technique, cyst type, size differences and healing by fractal analysis . *BMC oral health*, *24*(1), 1271. https://doi.org/10.1186/s12903-024-04945-9

[8] Safadi, A., Kleinman, S., Gigi, D., Wengier, A., Oz, I., Abergel, A., Koren, I., & Ungar, O. J. (2020). Surgical management of odontogenic cysts involving the maxillary sinus - a retrospective study. *Journal of cranio-maxillo-facial surgery : official publication of the European Association for Cranio-Maxillo-Facial Surgery*, *48*(8), 800–807. https://doi.org/10.1016/j.jcms.2020.06.011

[9] Singh, H. P., Chahal, G. K., Sharma, G., & Gandhi, P. (2024). A systematic review on odontogenic cysts and tumours. *Journal of oral and maxillofacial pathology: JOMFP*, *28*(2), 268–274. https://doi.org/10.4103/jomfp.jomfp_460_23