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Editor



Clinical Reports in Dentistry

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Clinical Reports in Dentistry

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The book presents extensive case reports covering various clinical dentistry disciplines. In Oral Medicine, cases of various oral lesions and their risk factors were reported, as well as the precautions of radiotherapy for oral condition. In Oral Surgery, various surgical techniques were discussed related to orbital cavity reconstruction, mandibular defect reconstruction, arthroplasty, management of tumors in maxillofacial region, management of Schneiderian membrane perforation and lateral sinus lifting procedures in severe bone loss case.

The use of CBCT on implant planning and identification of ameloblastoma tumor margin were reported. In Prosthodontics, treatment of removable partial denture and orbital defect reconstruction were discussed. In Conservative Dentistry, endodontics treatment and retreatment in rare cases were discussed, including management of fracture instruments and iatrogenic pulp exposure and replantation of avulsed teeth. In Pediatric Dentistry, various techniques related to intrusive luxation, treatment of lip sucking and approach for children in special need toward dental anxiety were addressed.

In Orthodontics, a case of management malocclusion of a difficult case was reported. In Forensic Dentistry, the importance of forensic odontology in burnt victim age estimation and post mortem reconstruction methods were reported. In Periodontology, cases of trauma from occlusion and the aesthetic of crown lengthening were reported. This large collection of case reports, discussing various treatments of clinical problems, identification of oral diseases that are frequently encountered in daily practice will surely give valuable information for general practitioners and dental specialists in order to achieve the highest standard in clinical dentistry.

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Surgical Approach to Radicular Cyst with Relocation of The Inferior Alveolar Nerve: A Case Report

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Abstract

Objective: Radicular cysts are the most common cystic lesions in the jaw, with a prevalence of approximately 52% to 68% cysts affecting the jaw. These cysts are associated with non-vital teeth. Nonsurgical treatment includes root canal therapy, where the lesion is localized, or surgical treatment, such as enucleation of a large lesion. In this case report, we describe a surgical approach to a right mandibular radicular cyst with relocation of the inferior alveolar nerve due to surgical enucleation. **Case Presentation:** A 61-year-old female patient presented to the division of oral and maxillofacial surgery at Jakarta Hospital with the chief complaint of pain, swelling, and paresthesia of the right posterior jaw. Intraoral clinical examination revealed swelling at the buccal mucosal region 44–46. Unilocular periapical radiolucency associated with teeth 44–46 was revealed on a panoramic radiograph. The patient was treated by surgical enucleation under general anesthesia. **Conclusion:** In this patient, we performed enucleation with relocation of the inferior alveolar nerve as the surgical approach to radicular cyst. Depending on the size and extent of the lesion, surgical enucleation of a radicular cyst is necessary for optimal treatment and prevention of recurrence.

Keywords: radicular cyst, mandible, enucleation, inferior alveolar nerve

Surgical Approach to Radicular Cyst with Relocation of The Inferior Alveolar Nerve: A Case Report

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Introduction

Cysts are pathologic epithelial cavities containing fluid or semifluid material. Odontogenic cysts are derived from the epithelium due to dental growth. Some types of cysts are classified according to the stages of odontogenesis. Odontogenic cysts can be formed due to dental tooth infection, epithelial cell rests of Malassez, epithelium derived from dental crowns, dental lamina remnants, or possibly the basal layer of the oral epithelium. Cysts are often found in the mouth and maxillofacial areas, and those developing in the jaw bone region are fluid-filled cavities or semifluid materials surrounded by epithelium. Cystic fluid has a higher osmotic pressure compared to its surroundings, resulting in fluid entering the tissue in the cystic cavity, causing cyst enlargement and damage to the surrounding hard tissue [1,2].

The most common cyst in the jaw is the radicular cyst. This cyst is caused by dental caries with untreated necrotic pulp and periapical infection with a prevalence of 52%–68%. They are formed by chronic inflammatory processes and grow over long periods of time. Radicular cysts are also known as apical periodontal cysts and root canal cysts. Radicular cysts become very large due to their ability to expand and extend to adjacent tissues accompanied by rapid growth and high recurrence rates [2,3].

These cysts are generally not accompanied by symptoms, and some cases are diagnosed as radicular cysts following radiological examination. Therapy for radicular cysts includes nonsurgical treatment, such as root canal treatment, or surgical treatments such as enucleation, marsupialization, or decompression. Surgical treatment becomes more difficult when the larger cysts, especially if it is positioned near the structure of the inferior alveolar nerve [4,5].

Here, we describe a case of radicular cysts of the right lower jaw surrounding the first molars and first and second premolars of the right mandible. Treatment includes surgical enucleation, tooth extraction, and relocation of the inferior alveolar nerve.

Case Presentation

A 61-year-old woman presented to the Oral and Maxillofacial Surgery Division of Jakarta Hospital with the chief complaint of pain and swelling in the right lower jaw (Figure 1). She had been suffering from paresthesia in the right lower jaw for several months, but her facial expression muscles were fully functional. There was no previous history of systemic or allergic disease, and she denied trauma to the right lower jaw.



Figure 1. Intraoral appearance and swelling on the right mandible

A panoramic radiographic examination was performed, which detected swelling around the right mandibular first molar and right mandibular first and second premolars. Based on panoramic radiographs in the right mandibular region, a periapical unilocular radiolucency was suspected as a radicular cyst surrounding the distal roots of the first molar teeth and the right mandibular first and second premolars. The floor of the cyst wall was very close to the lower jaw, compressing the nerve so that the image of the inferior alveolar nerve bundle disappears, changing the position of the mental foramen (Figure 2).



Figure 2. Radiographic appearance of 3 teeth surrounded by a large radicular cyst

Our treatment of this case was based on clinical and radiological examination and was performed surgically under general anesthesia with the aim of removing the entire cyst with enucleation and simultaneously removing the infected teeth causing the formation of the cyst. This operation was based on minimally invasive techniques to protect the inferior alveolar nerve, with relocation of the nerve.

The patient was placed in the supine position, and asepsis and antisepsis were performed in the operating room under general anesthesia, with the area of operation covered by a sterile drape. Pehacain injection was performed as a vasoconstrictor in the mucobuccal fold of the mandibular canine region, followed by a vertical incision of mesial region 43–47 and opening the mucoperiosteal flap with a raspator. The inferior alveolar nerve exiting the mental foramen was separated from the cyst wall by osteotomy. In conventional techniques, a window is made in the buccal portion of the lower jaw by removing the corticocancellous bone (Figure 3). In this surgery, relocation of the inferior alveolar nerve is determined by the surgeon's experience and skills. The surgeon should attempt to perform osteotomy while keeping the inferior alveolar nerve away from the surgical site [6].

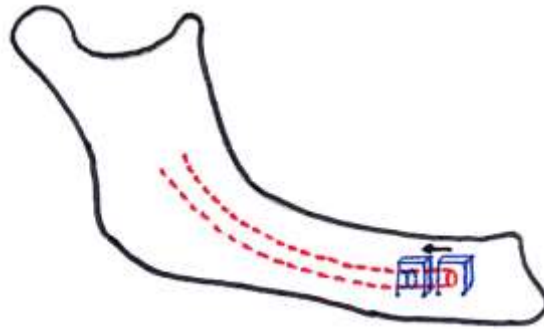


Figure 3. Illustrating the osteotomy technique with inferior alveolar nerve repositioning

The mandibular bone was opened with a round bur to identify the cyst wall area, and the cysts were removed with enucleation and extraction of the involved teeth. Special care is taken when relocating the inferior alveolar nerve in order to maintain nerve integrity. After the cyst was enucleated, we separated the compressed nerve from the cyst, which was clearly visible at the bottom of the bone cavity. Carnoy solution was applied and rinsed with 0.9% NaCl solution, and Suprasorb was applied in the cyst cavity in addition to primary approximation of the mucoperiosteal flaps using Vicryl 3-0. The specimens were sent to pathology for examination with a diagnosis of suspected radicular cysts (Figure 4).

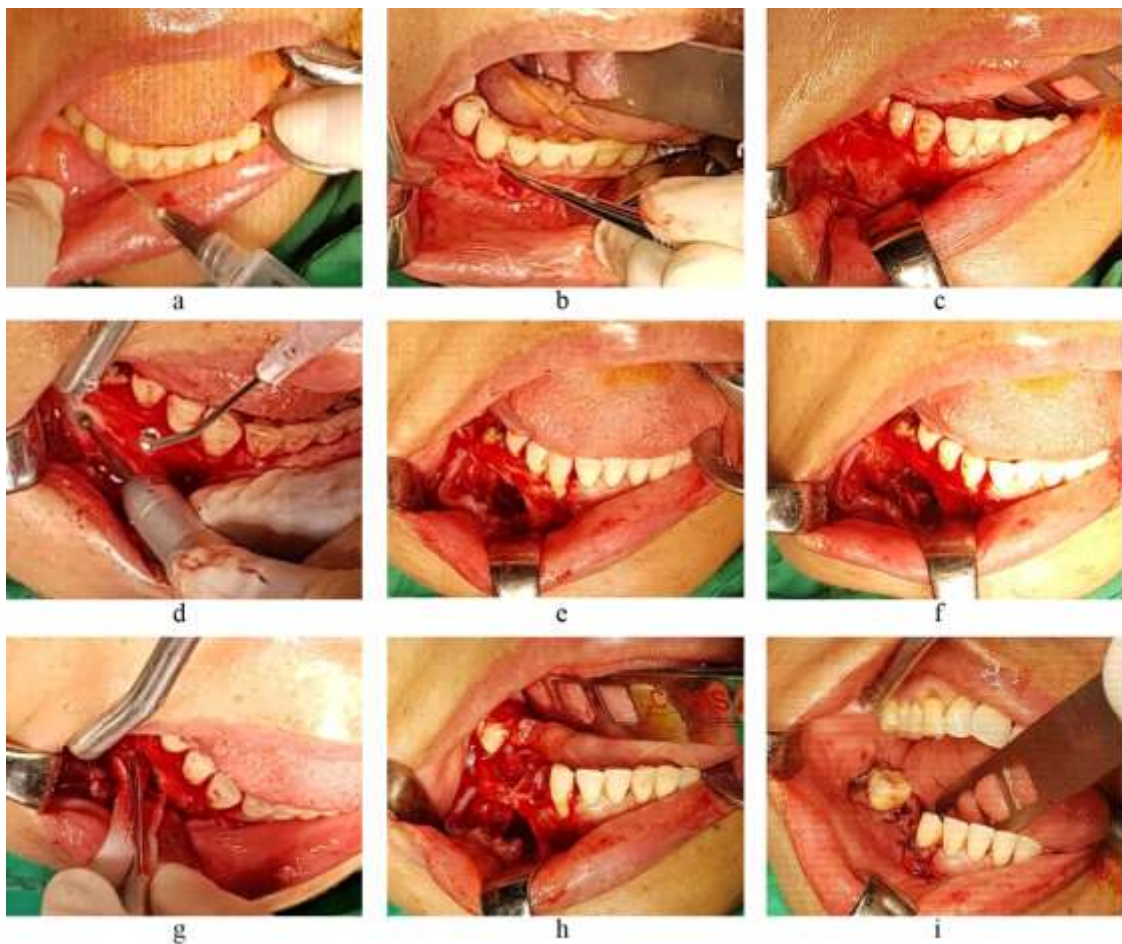


Figure 4. Surgical approach

Discussion

Radicular cyst is one of the most common cystic lesions in the jaw, with a prevalence of 52% to 68%, and typically occurs in the anterior maxillary region. The cyst is most commonly found in men in the third to fifth decade, with a ratio of 3:2. According to Shear et al., these cysts are not usually asymptomatic, grow slowly, and are not accompanied by extraoral swelling [3,7,8,9].

Intraoral swelling begins with the formation of the radicular cyst, which is usually bony hard, but because the cyst becomes larger, the bone covering the cyst can become very thin. The involved teeth are always non-vital and indicate discoloration. Although the teeth do not usually show root resorption, they may have smooth tooth root resorption [2].

Radicular cysts are also referred to as periapical cysts, periodontal cysts, root cysts, or dental cysts, originating from Malassez epithelial cells in the periodontal ligament as an inflammatory process due to pulpal or traumatic necrosis. Moreover, it is the most common inflammatory odontogenic cystic lesion primarily formed in the periapical region of the involved teeth [3,7,8,9].

Cyst pathogenesis occurs in 3 phases. The first phase involves inflammatory effects leading to the development of Malassez epithelial cells, which is also due to the influence of bacterial antigens, development of epidermal cell agents, and metabolites detached by several cells within periapical lesions. In the second phase, an epithelium-lined cavity is seen. The third phase is cyst growth, and is generally attributed to osmosis, but the mechanism remains unknown [3].

In this article, we reported a case of radicular cysts sized approximately 4 cm in diameter, and enucleation of the involved teeth was performed with extraction of cystic discharge. The floor of the cyst wall was very close to the lower jaw, and compression of the inferior alveolar nerve bundle disappeared and changed the position of the anterior mental foramen. Proper planning was essential to avoid radical surgery in this case and ensure adequate access for cyst enucleation and relocation of the inferior alveolar nerve.

The inferior alveolar nerve exiting the mental foramen was separated from the cyst wall by osteotomy. The goal was to relocate the inferior alveolar nerve with osteotomy to return the mental foramen to the normal position and ensure the cystic epithelial lesions were free from the surrounding tissue.

This is a complicated surgical procedure involving large cystic lesions and multiple teeth in the right mandible in addition to suppressing and covering the inferior alveolar nerve. Therefore, special planning is required, incisions are longer, and the flaps become wider, to facilitate relocation of the inferior alveolar nerve and enucleation of the cyst.

The flaps were helpful in performing the operation due to the presence of large radicular cysts in the region compressing the mandibular nerve. Special care was taken when relocating the inferior alveolar nerve and maintaining integrity of the nerve, then the cystic membrane wall was released, and the entire cyst enucleated. Immediately after cyst removal, the inferior mandibular nerve was released and replaced to its normal position. At 2-week follow-up, the patient did not complain of symptoms of paresthesia of the right mandible (Figure 5).



Figure 5. Postoperative view at 2 weeks

Conclusion

The surgical approach to the radicular cyst in this patient was enucleation, with relocation of the inferior alveolar nerve. Depending on size and extent of the lesion, surgical enucleation is necessary for achieving optimal treatment, preventing recurrence, and maintaining integrity of the nerve.

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