|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||

Available online on http://www.ijmbs.info

International Journal of Medical and Biomedical Studies; 2024; 8(5); 18-23

Case Report

Exploring the Uncommon: Mandibular Osteomyelitis in Pediatric Patient – A Case Report

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Received: 10-08-2024 / Revised 27-08-2024 / Accepted 28-09-2024
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DOI: **https://doi.org/10.32553/ijmbs.v8i5.2845**
Conflict of interest: Nil

Abstract:

Introduction: Osteomyelitis is often found in 60-70% of all body regions, but in the jaw area, it rarely occurs, especially in children, and with the development of antibiotics, the incidence of jaw osteomyelitis is decreasing. Osteomyelitis is an inflammatory bone condition involving the medulla and periosteum, one of the causes of which is bacterial infection. The diagnostic support with the best accuracy in this case is a CT scan, with precise imaging of the lines of the lytic lesion, medullary sclerosis, and bone sequestra.

Case: A 4-year-old girl patient complained of swelling on the left cheek and a bluish colour on the chin. The patient complained of losing six primary teeth in the lower region, with greenish discharge and bad breath. CT-Scan results showed destructive lytic lesions in the ramus, angle, corpus, left mandibular symphysis, and hyperostosis. The patient was diagnosed with osteomyelitis of the mandible.

Case Management: Sequesterectomy and debridement under general anaesthesia, with anatomical pathology results showing mandibular osteomyelitis due to *Actinomyces sp*. The patient experienced no complaints and significant healing results from treatment.

Conclusion: One of the bacteria that plays a role in mandibular osteomyelitis is *Actinomyces sp*. Proper diagnostic support and surgical planning can determine maximum postoperative results.

Keywords: mandibular osteomyelitis, pediatric, sequester ectomy*, Actinomyces sp.*

Introduction

Mandibular osteomyelitis is an inflammatory condition of the cortical bone and periosteum tissue, classified into acute and chronic.[1] The symptoms are swelling and pain in the mandibular area, as well as difficulty in mastication and accompanied by fever.[1,2] osteomyelitis is found in 60-70% of all body regions. At the same time, it is still rare in the jaw and children, and along with the development of antibiotics, the number of incidents is decreasing.[3] osteomyelitis is higher in the mandible than

the maxilla due to thick bone density and low cortical bone vascularisation. 1 Osteomyelitis is caused by infection, mechanical trauma, systemic diseases such as diabetes, autoimmune, malignancy, malnutrition, AIDS, and drugs that can affect osteomyelitis, such as steroids, chemotherapy drugs, and bisphosphonates.[1,4] The aetiology of osteomyelitis in children is rarely known, but poor oral hygiene, malnutrition, the virulence of microorganisms, and antibiotic resistance can affect the severity of infection.[3] Mandibular osteomyelitis examination is performed clinically and supportingly. Clinically, in acute conditions, there is fever, swelling, and erythema in the tissue, which is the cellulitis phase of the inflammatory process. Chronic conditions cause sequestration and nerve paresthesia in the alveolar bone and trismus in the masticatory muscles. There is a fistula intraorally and extraorally, the chronic phase of jaw osteomyelitis.[1,3] This patient underwent a CT scan and radiological supporting examination. The image of the sequestered lesion and the involucrum boundary can be seen. [5] In this case, management of mandibular osteomyelitis with adequate antibiotic therapy and sequester ectomy surgery is the correct procedure to remove infected bone fragments (sequestration).[6]

Case Report

A 4-year-old female patient complained of swelling and a bluish colour on her chin. +/- 3 months before admission, the patient complained that the six primary teeth of the lower frontjaw fell out by themselves, and a greenish liquid came out accompanied by bad breath. Extraoral clinical examination showed an asymmetrical face; there was swelling on the left cheek and a bluish colour on the chin (Figure 1). Intraoral examination revealed exposed bone necrosis of ± 10 cm in the mandibular alveolar bone accompanied by pus (Figure 2). Then, the patient underwent complete haematology and radiology examinations (CT scans and thorax). The results of the preoperative CT scan (Figure 3) showed destructive lytic lesions in the ramus, angle, corpus, left mandibular symphysis, and hyperostosis, with the conclusion of mandibular osteomyelitis.

Figure 1. Extra oral photo showing facial asymmetry.

Figure 2. Intra-oral photo shows sequestered lesions in the mandibular alveolar and poor oral hygiene.

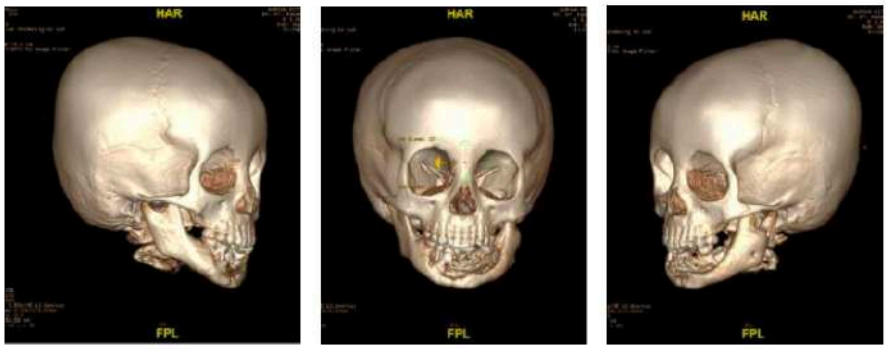

Figure 3. CT scan of the head without contrast shows destructive lytic lesions in the ramus, angle, corpus, left mandibular symphysis and hyperostosis.

Case Management

The patient was planned for sequesterectomy under general anesthesia. Intraoperatively, the patient underwent sequesterectomy and debridement with an intraoral approach. All seque tered tissue was removed, debridement was performed on the mandibular bone, permanent tooth buds 31,32,33,34,35,36,37,41,42,43,44 were removed, and healthy bone was left (Figure 4). The wound was then sutured on the mucosal layer with a 4-0 polyglycolic-acid thread. The sequestered tissue was sent to the anatomical pathology department for histopathological examination (Figure 5). The histopathological results showed osteomyelitis due to *Actinomyces sp*.

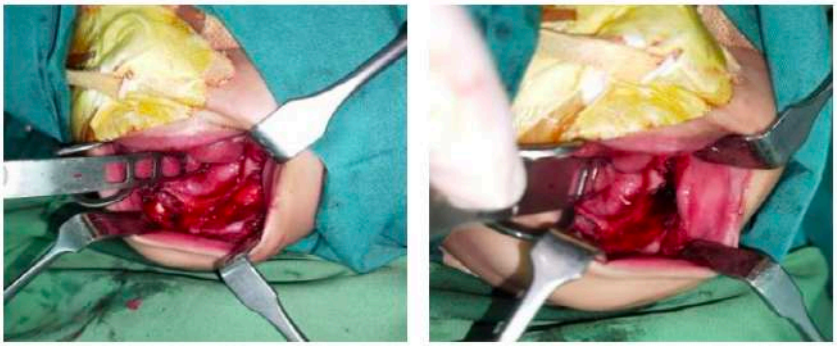

Figure 4. Intraoperative photo of sequesterectomy and debridement, leaving healthy bone tissue

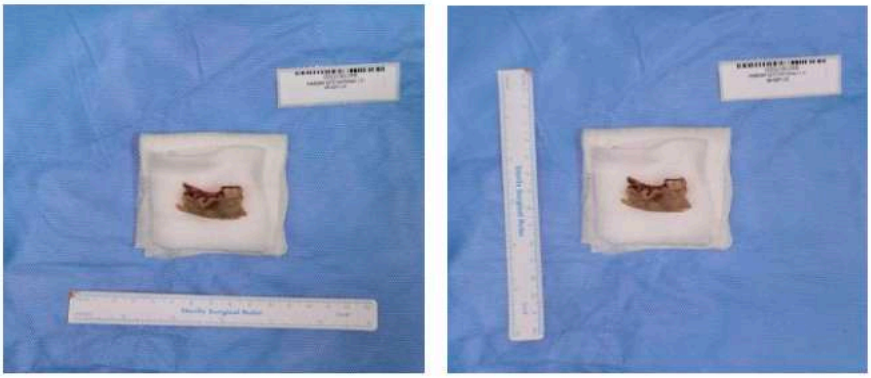

Figure 5. Photo of sequestered tissue sample for histopathological examination.

Postoperatively, the patient was hospitalised for three days for recovery and monitoring of u stable hemodynamic condition. The patient received drug therapy: Ampicillin injection 4x110 mg IV, Paracetamol infusion 3x150 mg IV, and a liquid diet. The patient's condition improved during treatment, and on the 3rd day, the patient was discharged and instructed to outpatient control.

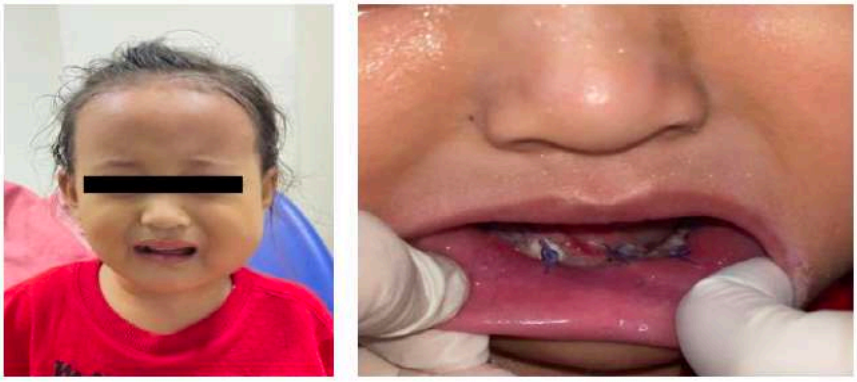

Figure 6. Clinical photo postoperative day 7, inflammation and swelling in the surgical area.

Figure 7. Clinical photo postoperative day 30, gingiva is seen to have healed, and no signs of inflammation.

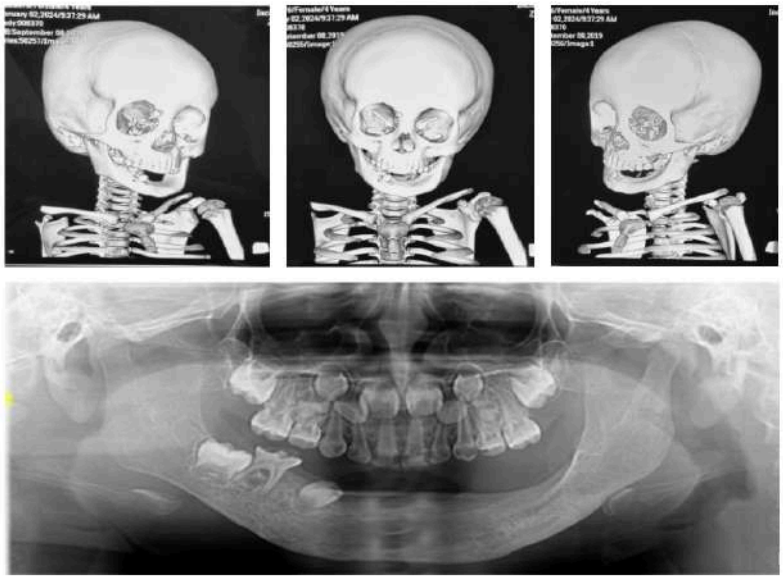

Figure 8. CT scan and panoramic photos after surgery on day 30, radiopaque image along the mandibular bone indicating new bone

Postoperative control on the 7th day, the patient was in good condition with stable hemodynamics. Extraoral examination showed that the cheek was still swollen, and the wound had partially closed well intraorally. However, she felt pain, and there were still signs of inflammation and swelling in the surgical area (Figure 6). The patient was rinsed with 0.9% NaCl, and further antibiotics were given for up to 1 week. Postoperative control on the 30th day showed the patient was in good condition and had typical vital signs. The postoperative wound had closed perfectly, the masticatory function was expected, and there were no signs of inflammation, pain, or swelling in the extraoral and intraoral surgical areas (Figure 7). The patient was performed panoramic photos and CT scans postoperatively (Figure 8) and was referred to the Pediatric Dentistry Department for further treatment.

DISCUSSION

Osteomyelitis is defined as inflammation of the bone marrow; clinically, it is an infection of the bone, which starts from the bone marrow cavity and spreads to the cortical bone and per osteum.[7] The diagnosis of osteomyelitis can be made by histopathological examination, microbiological culture and sensitivity tests.[8] Osteomyelitis of the jaw usually occurs in the mandible compared to the maxilla because the vascularisation of the maxilla is richer in blood vessels. In the mandible, it is only vascularised by the alveolar artery.[1] Whereas in children, it is rare; in this case, the patient denied a history of systemic disease, a history of mechanical/chemical trauma and taking regular medication. Still, before osteomyelitis occurred, the patient admitted that she had dental cavities at the lower jaw and poor oral hygiene. This can occur due to microorganisms' virulence factor, thus worsening the infection condition.[3]

Osteomyelitis of the jaw is generally divided into acute and chronic, the difference being the pain the patient feels. Acute cases with rapid onset, pain, swelling and erythema of surrounding tissues, lymphadenopathy, fever, malaise and leukocytosis. Chronic cases can cause mild or no pain, recurrent swelling, alveolar nerve paresthesia, trismus, exposed bone with ulceration and fistula.[3,4,6] The aetiology is caused by a bacterial infection, which is clinically characterised by extensive bone sequestration, pain, pus discharge and inflammation in the tissue around the gums. The pathogenesis of mandibular osteomyelitis begins with acute inflammation, oedema and pus formation, followed by an increase in intramedullary pressure, causing the collapse of blood vessels, ischemia and necrosis of the bone. [7] Generally, the microorganisms that play a role in osteomyelitis include *Staphylococcus Aureus, S. Epidermidis, Actinomyces sp,* anaerobic bacteria *Bacteroides, Peptostreptococcus spp, Fusobacterium and Prevotella.* [1,9] The most effective management of mandibular osteomyelitis is surgery and antibiotics. In this case, sequesterectomy and debridement were performed to remove necrotic bone, remove permanent tooth buds involved in infection, and leave healthy bone with good vascularisation. The consideration of choosing sequesterectomy surgery in this case is the young age, where bone healing is fast with minimal defects. The purpose of sequesterectomy is to remove avascular and necrotic bone tissue to increase blood flow and healing.[1,10] In cases of extensive mandibular osteomyelitis, bone resection is usually performed as a last resort if previous therapy is unsuccessful or to remove areas that have pathological fractures. Plate fixation and jaw fixation (IMF) can stabilise jaw function.[1] In this case, the patient was given intravenous Ampicillin antibiotics. Empiric administration of broadspectrum and long-term antibiotics (beta-lactam and clindamycin) is recommended for two weeks. Other nonsurgical therapies that can be provided include hyperbaric oxygen, antitumor necrosis factor alpha (TNFα) inhibitors and bisphosphonates.[1,4,5,8] During the one-month postoperative control, the patient had no complaints and normal

masticatory function. The results of the intraoral physical examination showed that the postoperative wound had healed. The condition of the lower jaw was partly devoid of tooth buds. The patient was then advised to install dentures so that chewing could function properly.

Conclusion

Mandibular osteomyelitis in children is rare, but it can occur due to several factors, such as the virulence of microorganisms and patient immunity. Surgical procedures such as sequesterectomy, debridement, and broadspectrum antibiotics are the right choices for this case. Correct diagnosis, suitable treatment planning and periodic evaluation are essential in treating mandibular osteomyelitis in children.

References

1. Miloro, Michael. Peterson's principles of oral and maxillofacial surgery. Eds. G. E. Ghali, Peter E. Larsen, and Peter D. Waite. Vol. 1. Hamilton: BC Decker, 2004.
2. Saarinen, Riitta T., et al. Mandibular osteomyelitis in children mimicking juvenile recurrent parotitis. International Journal of Pediatric Otorhinolaryngology 75.6 (2011): 811-814.
3. Rochmah, Yayun Siti. Osteomyelitis Kronis Mandibula Pasca Ekstraksi Gigi Disertai Bell' S Palsy. Odonto: Dental Journal 6.1 (2019): 52-55.
4. Woo, Sook-Bin. Oral pathology: a comprehensive atlas and text. Elsevier Health Sciences, 2016.
5. Neville, Brad W., et al. Oral and maxillofacial pathology-E-Book. Elsevier Health Sciences, 2023.
6. Sanjaya, A. N., Pramanik, F., & Rizki, R. F. Gambaran radiografis panoramik pada evaluasi kasus osteomielitis pasca sequestrectomy disertai temuan florid osseous dysplasia Panoramic radiographs in the evaluation of osteomyelitis cases after sequestrectomy with findings of florid osseous dysplasia (FOD). Jurnal Kedokteran Gigi Universitas Padjadjaran, (2021). 32(3), 92-97.
7. Rasul, M. Irfan, and Eka Prasetiawaty. Management of chronic osteomyelitis with extra oral fistula in the mandible. Makassar Dental Journal 9.1 (2020).
8. Balaji, S. M., and Padma Preetha Balaji. Textbook of Oral & Maxillofacial Surgery-E Book. Elsevier Health Sciences, 2018.
9. Andersson, L., Kahnberg, K. E., & Pogrel, M. A. (Eds.). Oral and maxillofacial surgery. John Wiley & Sons. (2010).8
10. Simanjuntak, H. F., Sylvyana, M., & Fathurachman, F. Osteomyelitis kronis supuratif mandibula sebagai komplikasi sekunder impaksi gigi molar tiga. MKGK (Majalah Kedokteran Gigi Klinik)(Clinical Dental Journal) UGM, 2016: *2*(1), 13-18.