



BRIDGING THE GAP BETWEEN THE OPERATING ROOM AND THE PHARMACY: STRATEGIES FOR MANAGING OSTEOMYELITIS WITH CO-MORBIDITIES

Maxillofacial Surgery

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ABSTRACT

Osteomyelitis is a multifaceted disease that poses various challenges in terms of pathophysiology, clinical presentation, and management. As one of the most difficult-to-treat infectious diseases, it is notorious for its progressive bony destruction and sequestration. This paper presents a case series that highlights three patients with osteomyelitis who had diverse comorbidities and etiologies. One of the patients with left mandibular osteomyelitis was a known case of diabetes and multinodular goiter with a recent history of dengue fever. The second patient had a history of COVID-19 and recurrent sinusitis. He presented with left maxillary osteomyelitis with underlying diabetes and hypertension. The third patient presented with extraoral draining sinus and total mandibular osteomyelitis and had osteogenesis imperfecta. In this case series, we present the various management strategies employed to manage this debilitating disease, including surgical debridement, management of underlying systemic disease, and prolonged antibiotic therapy. The case series underscores the importance of tailored management plans for osteomyelitis patients with diverse medical histories. Accurate and timely diagnosis is crucial to guide appropriate treatment strategies and ensure successful outcomes.

KEYWORDS

Osteomyelitis, Maxillofacial, Antibiotics, Surgical management

INTRODUCTION

Osteomyelitis, a condition characterized by inflammation of the bone and bone marrow, presents significant difficulties in the field of maxillofacial medicine. Although this condition is widely recognized in the medical community, its occurrence in the maxillofacial skeleton, specifically the mandible, is relatively common, particularly in developing countries like India¹.

This article presents three cases that explore the clinical manifestations, diagnostic approaches, and treatment options for osteomyelitis in the maxillofacial skeleton.² Through an analysis of three unique cases, our objective is to provide insights into the specific challenges and potential strategies encountered when managing this intricate condition.

By showcasing both the obstacles and achievements encountered in the treatment of osteomyelitis, this case series aims to contribute to the existing literature and serve as a valuable resource for healthcare professionals involved in diagnosing and treating maxillofacial infections. By enhancing our collective knowledge of this rare form of osteomyelitis, we can enhance patient care, reduce complications, and guide future research efforts in this domain.

Case 1

The 53-year-old woman experienced pain in her left jaw for a month after having a tooth extraction in that area. She also developed swelling on the left side of her face during the same time period. The patient had a history of dengue fever 40 days prior, as well as hypertension and diabetes for the past six years, and she was taking medication for these conditions.

During the examination, a diffuse swelling was observed on the left side of the jawbone, specifically in the mandibular body region. The swelling was tender to touch, firm to palpation, and did not compress or pulsate. Intraorally, an unhealed socket was found where the tooth had been extracted (tooth number 37). Vestibular obliteration was observed in the region from tooth number 31 to the ascending ramus. Grade II mobility was detected in teeth 31, 32, 33, and 34, and tenderness was present in the vestibule of the tooth number 31-angle region. A palpable, tender, and movable lymph node was identified on the left side at Level II A. A biopsy revealed the presence of chronic inflammation and gram-positive filamentous organisms.

During the surgical procedure, the lesion was accessed through a vestibular incision. As the lower border was unaffected, only sequestrectomy (removal of dead bone) and saucerization (shaping the bone to promote healing) were performed. After the surgery, the patient received postoperative antibiotics, including intravenous Clindamycin 600mg, intravenous Metrogyl 100ml, intramuscular Diclo 75mg, and intravenous Pantop 40mg.



Fig 1: Osteolytic lesion involving the left mandible from 31 till the left mandibular angle region



Fig 2: Sequestrectomy and saucerization of left mandible

Case 2

A 57-year-old man presented with a complaint of pain in the upper left back region of his jaw and a discharge of fluid from his left nostril. He

had been experiencing these symptoms for the past six months, along with the presence of white-colored foul-smelling fluid and watery discharge within his mouth. The patient had undergone a tooth extraction on the upper left side of his jaw at a local hospital, after which the nasal regurgitation ceased. He was a known case of diabetes and hypertension for the past one and a half years. He gave a history of dust allergy for two years and contracted COVID-19 one year ago, requiring oxygen and steroid therapy for three days. The patient also underwent surgery 18 months ago for sinusitis.

Upon examination, a mild diffuse swelling was noted in the upper left cheek region which was tender on palpation. Intraorally, a 1 cm x 1 cm area of yellowish necrotic bone covered with slough was observed in the 26 region. A palatal swelling was seen extending from the 23 to 28 region in an anterior-posterior direction, extending from the midpalatal raphe to the attached gingiva. The swelling was compressible, and pus discharge was observed buccally upon manipulation of the palatal swelling. The cold test indicated that all teeth in the area were non-vital, and the water-holding test yielded positive results.

The lesion was accessed through crevicular and crestal incisions extending from the right lateral incisor up to the third molar. Sequestrectomy was performed, along with the removal of the affected sinus lining. The sinus was packed with Neosporin-impregnated gauze and primary closure was achieved over a layer of harvested buccal pad of fat. The gauze was removed two days later. Following the surgery, a palatal obturator was provided, and the patient received intravenous antibiotics and steroid along with analgesics. Oxymetazolin nasal drops were administered.



Fig 3: Necrotic bone of 1 cm x 1 cm covered with slough in the first molar region.



Fig 4: CBCT showing bilateral haziness of the sinus with the destruction of the left maxilla.

Case 3

A 7-year-old boy initially noticed a swelling with pus discharge in November 2019 which was managed conservatively elsewhere with IV Ceftriaxone twice a day for 10 days and analgesics. Culture and Sensitivity, CBNAAT, and tuberculosis (TB) tests were performed, all of which yielded negative results.

The patient is a known case of osteogenesis imperfecta, which was diagnosed in 2018 through genetic studies. The patient has experienced multiple fractures since the age of two and has undergone

several extractions in the past. The patient is a product of consanguineous marriage, with his maternal grandmother also having the same genetic condition. On extraoral examination, a diffuse swelling was observed in the middle and lower thirds of the face bilaterally. A 2.5 x 1.5 cm area of slough with pus discharge was noted near the left inferior border of the mandible, approximately 0.25 cm away from the midline.

Intraorally, a brownish-black necrotic region measuring 2.5 x 1.5 cm was observed in the left mandibular anterior region. The area extended from the right central incisor to the left first premolar region extending approximately 0.5 cm into the buccal vestibule.

Mandibulectomy was performed through a vestibular incision, spanning from the right to the left mandibular angle. Gentamycin antibiotic beads were placed in the defect site due to the patient's resistance to most antibiotics, and the site was closed with plans for reconstruction in subsequent stages.



Fig 5: Diffuse swelling of the middle and lower third of the face, bilaterally



Fig 6: Gentamycin beads placed following angle to angle resection of the mandible

DISCUSSION:

Osteomyelitis is an inflammatory condition affecting the bone, often caused by an infection in the medullary cavity. It spreads rapidly, involving the haversian systems and periosteum in the affected area. In the past, before the introduction of antibiotics, osteomyelitis of the jaws was common and often fatal. However, antibiotics, antimicrobial drugs, better surgical techniques, and Hyperbaric oxygen therapy have greatly impacted the incidence and prognosis of this disease.¹

Recently, there has been a change in how osteomyelitis presents clinically. This is primarily due to the increasing prevalence of systemic diseases that weaken the host's immune system, such as diabetes mellitus, HIV infections, immunosuppressive medications, malnutrition, osteogenesis imperfecta, and even COVID-19. These factors have made the management of osteomyelitis more complex.³

Recognizing these changing trends is important for diagnosing and treating osteomyelitis effectively. Healthcare professionals can develop better strategies by understanding the impact of systemic diseases and other contributing factors. This knowledge can lead to improved patient outcomes, refined treatment approaches, and guide future research in the field of osteomyelitis.

This article discusses three cases that highlight the strategies used to bridge the gap between patient care and these evolving trends

Comprehensive Decision-Making: Effective management of osteomyelitis requires careful decision-making regarding surgical intervention and antibiotic therapy. In the presence of co-morbidities, such as diabetes, hypertension, covid 19, and osteogenesis imperfecta, customization of treatment plans becomes essential. It is crucial to determine the most appropriate surgical approach and select antibiotics that consider potential drug interactions and adverse effects in relation to the patient's co-morbidities.⁴

Tailored Antimicrobial Therapy: Optimizing antimicrobial therapy is a key aspect of managing osteomyelitis in patients with co-morbidities. Each case requires an individualized approach to antibiotic selection, dosing, and duration of treatment. Pharmacists play a vital role in ensuring appropriate drug choices, considering factors such as drug-drug interactions, potential side effects, and patient-specific characteristics as in the third case where the patient was sensitive to most antibiotics precluding the selection of gentamycin following the antibiotic sensitivity test. Tailoring antimicrobial therapy, considering the patient's co-morbidities, and optimizing therapeutic outcomes⁵ helps bridge the gap between the operation theater and the pharmacy.

Monitoring and Management of Co-morbidities: Patients with co-morbidities require close monitoring of their underlying conditions during the treatment of osteomyelitis. Regular assessment of blood glucose levels, blood pressure, and other relevant parameters is necessary.⁶ As in the second case the patient's diabetic status was closely monitored and taken to surgery after managing the diabetic status. Effective communication between the operating room and the pharmacy facilitates timely adjustments to medications, innovations in drug delivery as seen in Case 3, and overall optimization of patient care.

CONCLUSION:

Coordinated decision-making, tailored antimicrobial therapy, careful monitoring and management of co-morbidities, and appropriate surgery are essential components of a multidisciplinary approach. By bridging the gap between the operating room and the pharmacy, healthcare teams can improve patient outcomes, optimize treatment plans, and ensure the comprehensive care of individuals with osteomyelitis and co-existing medical conditions.

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