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ACUTE OSTEOMYELITIS OF THE MANDIBLE IN A GERIATRIC FEMALE INDIVIDUAL DURING PANDEMIC IN INDIA: A CASE REPORT AND LITERATURE REVIEW

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Introduction

Osteomyelitis is defined as an inflammatory process of the bone and bone marrow due to infectious organisms that results in localized bone destruction, necrosis and apposition of new bone. In other words, it simply means infection of the bones or joints. They are frequently associated with immunocompromised patients and can be either acute or chronic, with or without suppuration [1, 2, 3]. This article describes a case report of acute osteomyelitis and brief review of osteomyelitis.

Case report

A 75-year-old female patient reported to our hospital with pain and swelling on the left side of the face. Patient experienced severe throbbing pain a few days after extraction. Swelling developed 2 weeks after the extraction and progressively increased in size. Past dental history revealed that she had undergone extraction of lower left second molar 1 month back. Past medical history revealed that she was diabetic and hypertensive and was under medication for the same for the past 21 years. Patient had no history of jaw fracture and radiation exposure.

Extraoral examination revealed swelling on the left side of the face measuring 2x3 cm, soft in consistency, tender on palpation with an increase in temperature. No sinus opening or fistula was observed. (Figure 1).

Intraoral examination revealed exposed alveolar bone, bony sequestrum with destruction of gingiva and alveolar mucosa in the lower left mandibular region. The surrounding gingiva was oedematous, erythematous and exhibited bleeding on probing. (Figure 2) No pus discharge was observed. Patient was partially edentulous with only the maxillary and mandibular anterior teeth present. Generalized chronic periodontitis was observed with Grade II mobility. No paraesthesia was observed.

Radiograph revealed radiolucency with cortical bone destruction in relation to the lower left mandibular region. Laboratory investigations revealed an elevated CRP level and an increased albumin level in urine.

Based on the history, clinical features, radiographic features and laboratory diagnosis a diagnosis of acute osteomyelitis was given. Incision and drainage were done followed by an antibiotic therapy. The exposed bone was removed followed by curettage and irrigation. Patient was recalled after 10 days and exhibited no post-operative complications.

Discussion

Oral and maxillofacial area are more susceptible to osteomyelitis since the bacteria present in dental plaque and saliva serve as a source of infection in immunocompromised patients [3].

Classification

1. Zurich classification system:
   Based on aetiology and pathogenesis of the disease:
   - Acute osteomyelitis
   - Secondary chronic osteomyelitis
   - Primary chronic osteomyelitis

   Acute and secondary chronic osteomyelitis are caused by bacterial infection leading to suppurat-
tion, fistula formation, and bone sequestration. They can occur subsequent to teeth extraction, odontogenic disease, pulpal necrosis, periodontal infection, foreign bodies and fractures, which are infected. Usually, the symptoms of acute osteomyelitis occur within 4 weeks. However, primary chronic osteomyelitis is a disease of unknown cause that is rare, chronic and nonsuppurative [4, 5].

2. Suei classification system:
Based on aetiology, suppuration, radiographic and histologic features, response to antibiotic medication, prognosis, and complications:
- Bacterial osteomyelitis
- Osteomyelitis in SAPHO (synovitis, acne, pustulosis, hyperostosis, osteitis) syndrome

Bacterial osteomyelitis is a suppurative, intraosseous and hematogenous and osteomyelitis that are commonly caused secondary to odontogenic infections. It can either be acute or chronic. Staphylococcus, Peptostreptococcus and Pseudomonas are the most commonly involved species.

Osteomyelitis in SAPHO syndrome is an acute sclerosing osteomyelitis with an unknown cause and poor prognosis. Propionibacterium, Peptostreptococcus and Actinomyces species have been isolated from patients with disease.

3. Classification of suppurative osteomyelitis:
- Osteomyelitis with periostitis
- Tuberculous osteomyelitis
- Sclerosing osteomyelitis
  - Focal type
  - Diffuse type

Suppurative osteomyelitis is caused by bacterial infection and respond to antibiotic therapy. In contrast, nonsuppurative osteomyelitis are rarely caused by bacterial infections and don’t respond to antibiotic therapy. However, a few cases of osteomyelitis involving the jaws are difficult to distinguish if they are suppurative or nonsuppurative [6, 7].

Etiopathogenesis
Osteomyelitis is commonly caused by the bacterial species Staphylococcus and Streptococcus. Seeding occurs and the infection of the medullary cavity spreads rapidly to involve the haversian system and extends to the periosteum of the surrounding area [8, 9, 10]. The spread can occur through the bloodstream, from an infection focus without vascular insufficiency and contiguous infection with vascular insufficiency. Osteomyelitis without vascular insufficiency occurs secondary to trauma or surgery due to direct inoculation of bacteria or extension to bone from adjacent soft tissue contamination. Osteomyelitis with vascular insufficiency is commonly seen in lower extremities, mostly in diabetic foot infections [11, 12, 13]. Osteomyelitis commonly occurs in immunocompromised patients of diabetes mellitus, sickle cell anaemia, malignancy and AIDS (Acquired Immune Deficiency Syndrome). They are also frequently associated with alcohol, tobacco and IV drug abuse [14]. Current concepts suggest the involvement of osteocytes in recruitment of immune cells, S. aureus invasion in submicron channels of the cortical bone, and presence of polymorphonuclear cells in im-

Clinical features
Patients usually exhibit swelling, fever, pain, erythema, fistula and purulent discharge [15]. Restricted mouth opening, paraesthesia of the lip, hypoesthesia of the inferior dental nerve, and pathologic fractures can also be seen [16, 17].

Radiographic features
The characteristic features may not be observed in early stages of the disease. Panoramic radiograph may demonstrate increased thickness of alveolar lamina dura, sclerogenic variation around mandibular canal and maxillary bone, the bone pattern and osteosclerosis.

Acute osteomyelitis may exhibit periosteal reaction that is secondary to elevation of peristeme and a well-circumscribed bony radiolucency. Chronic osteomyelitis demonstrates sclerotic and thickened involucrum surrounding the sequestrum, cortical destruction, a disorganised trabecular pattern and ill-defined radiolucency [18, 19, 20, 21].

Histopathological features
Acute osteomyelitis shows irregular and fragmented trabeculae with fibrin exudate and intramedullary granulocyte infiltrate. Chronic osteomyelitis may demonstrate reactive osseous tissue surrounded by osteoblasts, highly fibrosed medullary spaces, granulation tissue consisting of macrophages, plasma cells, lymphocytes, and neutrophilic granulocytes [22, 23, 24, 25].

More than five polymorphonuclear cells (PMNs) per high-power (×400 magnification) field should be present for confirmation of acute inflammatory cell infiltrate [26].

Laboratory diagnosis
Elevated levels of C-reactive protein, leukocyte counts and erythrocyte sedimentation rate may be demonstrated. Microbial cultures and special stains like Gram stain, Ziehl-Neelsen stain can demonstrate the causative organisms [27].

Management
The primary goal is treatment and or elimination of the causative factor followed by antibiotic therapy instituted according to antibiogram. Surgical therapy includes incision and drainage, jaw resection in invasive and extensive cases. Decortication, sequestrectomy and saucerization can also be done [28, 29, 30]. Hyperbaric oxygen therapy can be given in patients with chronic osteomyelitis associated with necrotizing soft tissue. Improved patient survival, better outcome and a decreased need for surgical intervention have been observed in patients treated with hyperbaric oxygen [31].

Conclusion
Osteomyelitis is a rare, invasive and destructive bacterial infection that can affect the quality of life. Further research in diagnosis criteria and techniques for management of osteomyelitis must be developed for better outcome and patient survival.

Authors’ contribution statement
The author confirms sole responsibility for the following: study conception and design, data collec-
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Summary

A 75-year-old female patient reported to our hospital with pain and swelling on the left side of the face. Patient experienced severe throbbing pain a few days after extraction. Swelling developed 2 weeks after the extraction and progressively increased in size. Past dental history revealed that she had undergone extraction of lower left second molar 1 month back. Past medical history revealed that she was diabetic and hypertensive and was under medication for the same for the past 21 years. Patient had no history of jaw fracture and radiation exposure. Radiograph features showed cortical destruction and an increase in CRP level was observed through lab investigations. Radiograph revealed radiolucency with cortical bone destruction in relation to the lower left mandibular region. Laboratory investigations revealed an elevated CRP level and an increased albumin level in urine. Based on the history, clinical features, radiographic features and laboratory diagnosis a diagnosis of acute osteomyelitis was given. Incision and drainage were done followed by antibiotic therapy. The exposed bone was removed followed by curettage and irrigation. Patient was recalled after 10 days and exhibited no post-operative complications. This case was treated with antibiotic therapy and localized surgical management. The primary goal is treatment and or elimination of the causative factor followed by antibiotic therapy instituted according to antibiogram. Surgical therapy includes incision and drainage, jaw resection in invasive and extensive cases. Decortication, sequestrectomy and saucerization can also be done. Hyperbaric oxygen therapy can be given in patients with chronic osteomyelitis associated with necrotizing soft tissue. Improved patient survival, better outcome and a decreased need for surgical intervention have been observed in patients treated with hyperbaric oxygen. Osteomyelitis is a rare, invasive and destructive bacterial infection that can affect the quality of life. Further research in diagnosis criteria and techniques for management of osteomyelitis must be developed for better outcome and patient survival.

Key words: osteomyelitis, infection, oral surgery.

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ГОСТРИЙ ОСТЕОМІЄЛІТ НИЖНЬОЇ ЩЕЛЕПИ В ЖІНКИ ПОХИЛОГО ВІКУ ПІД ЧАС ПАНДЕМІЇ В ІНДІЇ – КЛІНІЧНИЙ ВИПАДОК І ОГЛЯД ЛІТЕРАТУРИ

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Резюме

У лікарню звернулася пацієнка 75 років зі скаргами на біль і набряк лівої половини обличчя. Сильний пульсуючий біль виник через кілька днів після видалення зуба. Набряк утворився через 2 тижні після видалення зуба і прогресивно збільшувався. З історії лікування відомо, що 1 місяць тому пацієнка перенесла видалення нижнього лівого другого моляра. З анамнезу відомо, що пацієнка хворіє на інсулінозалежний діабет і артеріальну гіпертензію і вживає відповідні препарати протягом останніх 21 року. Пацієнка не мала в анамнезі переломів щелепи та радіаційного опромінення. На рентгенограмі виявлено деструкцію кортикальної кістки в ділянці нижньої лівої нижньої щелепи. Лабораторні дослідження виявили підвищений рівень С-реактивного білка і підвищений рівень альбуміну в сечі. На рентгенограмі виявлена просвітлення з деструкцією кортикальної тканини, а в лабораторних дослідженнях – підвищенням рівня С-реактивного білка і підвищений рівень альбуміну в сечі. На підставі анамнезу, клінічних ознак, рентгенологічних особливостей і лабораторної діагностики встановлено діагноз: гострий остеомієліт нижньої щелепи. Фітоантібіотична терапія включала лікування інфекції і усунення причинного фактора, зокрема антибіотикотерапію відповідно до антибіотикограми. Хірургічна терапія включала розріз і дренування з подальшою антибактеріальною терапією. Проведено видалення оголеної кістки з подальшим кюветуванням й аріджатком. Пациєнцю було вписано через 10 днів, післяоперативних ускладнень не було. У цьому випадку проводили антибіотикотерапію й локальну хірургічну лікування. Першочерговим завданням було лікування і/або усунення причинного фактора з підходом до антибіотикограми. Хірургічна терапія охоплює розріз і дренування, резекцію 3/4 лівого моляра. Лікування було проведено без ускладнень.

Ключові слова: остеомієліт, інфекція, хірургія порожнини рота.