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Extensive Chronic Osteomyelitis of Bilateral Maxilla in a Diabetic Patient: A Case Report

[1]Joyce Sequeira , HOD, Professor, Department of Oral And Maxillofacial Surgery, Yenepoya Dental College, Mangalore,Karnataka.

[2]Vinayakrishna Kolari, Reader, Department of Oral And Maxillofacial Surgery, Yenepoya Dental College, Mangalore,Karnataka.

[3]Anchal Mehra, Postgraduate Student, Department of Oral And Maxillofacial Surgery, Yenepoya Dental College, Mangalore,Karnataka.

Corresponding Author: Anchal Mehra, Postgraduate Student, Department of Oral And Maxillofacial Surgery, Yenepoya Dental College, Mangalore,Karnataka, India.

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Abstract

Osteomyelitis of the jaws is relatively rare in the present era. Maxillary osteomyelitis is relatively rare than mandibular osteomyelitis because of the extensive blood supply and strut-like pattern of the maxillary bone that makes it less prone to chronic infections.

Here, we present a case of osteomyelitis of the maxilla in a 55-year-old female with diabetes since 3 years. The patient presented to the Department of Oral and Maxillofacial Surgery with pain and pus discharge with multiple draining sinuses in maxilla since 3 months . A brief history ,clinical examination and computed tomography (CT) scan concluded as chronic osteomyelitis of the maxilla. The patient was managed with sequestrectomy and debridement of bilateral maxillae along with extraction of the involved teeth. Surgical maxillary plate to support the underlying tissues supported with empherical antibiotic therapy.

Keywords: Chronic Osteomyelitis, Maxilla, Diabetic Mellitus

Introduction

Osteomyelitis is the inflammation of the bone, which starts as an infection of the medullary cavity with rapid involvement of the haversian systems and extension into the periosteum [1].It occurs more frequently in the mandible than in the maxilla although most of the cases of osteomyelitis of the jaws are of odontogenic origin, other sources of infection are also reported. Macbeth classified maxillary osteomyelitis as (i) traumatic, which occurs after any injury or surgery, (ii) rhinogenic, which occurs due to the spontaneous spread of infection from the antrum,(iii) postoperative rhinogenic, and (iv) odontogenic, which occurs due to the progression of

dental-root sepsis to osteomyelitis [2]. Osteomyelitis of the maxilla occurs primarily in infants, and rarely in adults.It is an inflammatory reaction of bone to infection which originates from either a dental infections, trauma, soft tissue wound or surgical site.In maxillary osteomyelitis, other predisposing factors include maxillary sinusitis and radiation [3]. When osteomyelitis caused by sinusitis, it often involves the frontal bone and rarely the maxilla due to its relatively well-developed vascular supply and thin bone structure of the maxilla. Thin cortical plate and a relatively rare paucity of medullary bone in the maxilla preclude confinement of infection within bone and permit the dissipation of edema and pus into the soft tissue and paranasal sinuses [4].

Maxillary necrosis can occur due to bacterial infections such as osteomyelitis, viral infections such as herpes zoster or fungal infections such as mucormycosis, aspergillosis, etc [5].

The advent of antibiotic therapy has led to a decrease in the occurrence of osteomyelitis of the jaw. Systemic diseases that compromise an individual's immune system, such as diabetes mellitus, HIV, malnutrition, and the use of chemotherapeutic agents are also known to play a role in the pathogenesis of osteomyelitis [3].

In a chronic suppurative osteomyelitis,subjective symptoms are deep pain, malaise, fever and anorexia. In a span of 10-15 days after the onset,teeth involved began to losen and sensitive to percussion. Multiple draining sinuses around the gingival sulcus or through mucosal and cutaneous fistulae may be noted. Firm cellulitis of the cheek, dimensions of the bones are often enlarged from increased periosteal activity, abscess formation ,erythema and tenderness to palpation may also be noted. Osteomyelitis of the jaws usually requires both medical and surgical treatments as usually seen in actinomycotic conditions, associated with pain in the upper jaw [6].

In this paper, we present a case of extensive bilateral chronic osteomyelitis of the maxilla in a middle-aged patient with diabetes.

Case Report

A 55-year-old female patient visited the Department of Oral and Maxillofacial Surgery with a history of pain and multiple draining sinuses from maxilla since 3 months as seen in Figure 2. Orthopantomogram (OPG) seen in Figure 3 was advised, which showed areas of bone loss in the maxilla around the teeth from first molar of right side to second premolar of the left side. The patient was then advised for a computed tomography (CT) scan to know the nature and extent of the disease. CT scan of the patient revealed osteolytic destruction of the maxillary region extending to zygoma on both sides shown in Figure 4-7.

On examination, mild swelling and severe tenderness was noted over the right zygomatic region as seen in Figure 1 as well as generalized mobility of the maxillary teeth from 11-18 and 21-25 ,with multiple pus draining sinuses in maxilla since 3 months. A fissure was noted in the right anterior palatal region.

Figure 1: Mild swelling noted over the right zygomatic bone

Figure 2: Multiple pus discharging sinuses

Based on the history,clinical examination and radiographic examination it was concluded as chronic suppurative osteomyelitis of the maxilla The patient was kept on empirical antibiotic coverage for 2 weeks, Inj Augmentin (amoxicillin , clavulanic acid 1.2GM IV BD, Inj Gentamicin 80MG BD, Inj Metronidazole 100ml IV TID , diluted hydrogen peroxide gargle BD which improved the condition. The diabetic status of the patient was kept under control with Oral hypoglycemic agent Tab Glycomet GP-1 (metformin) OD and with strict diabetic diet during the entire stay in the hospital. Inj Diclofenac 75mg IM BD was given for pain management.

Investigations

Radiographic examination

Figure 3: Preoperative OPG

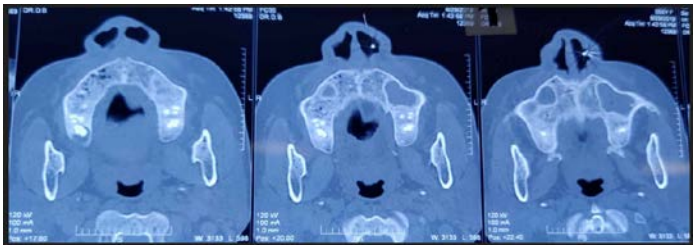

Figure 4: Preoperative CT scan

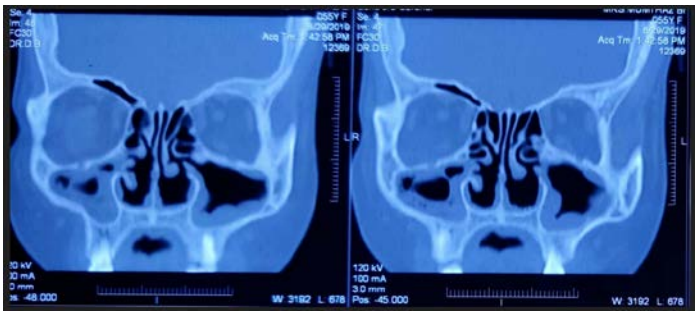

Figure 5: Preoperative CT scan

Figure 6: Preoperative 3D CT scan

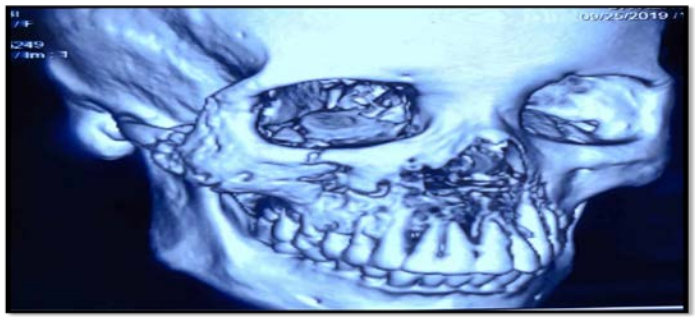

Figure 7: Preoperative 3D CT scan

Surgical management

Patient had uncontrolled diabetes on admission and was managed by optimal glycemic control. FBS was 125mg/dl before surgery. Surgery was planned under general aneasthesia. A crevicular incision was made from the 18-25 region as shown in Figure 8. The mucoperiosteum was reflected, grade III mobile teeth from 18 -25 were removed seen in Figure 12 . Sequestrectomy and curettage done with the removal of the sinus lining as seen in Figure 9 .The operative area was irrigated with metronidazole 500mg/100ml. Once hemostasis was achieved, suturing was done using vertical mattress technique using 3-0 vicryl as shown in Figure 10. A maxillary palatal plate was placed as shown in Figure

11 to support the underlying tissues and was secured with sutures (1-0 ethilon).

Figure 8: Extensive necrotic destruction of both maxilla.

Figure 9: Excised specimen of right maxilla and palate.

Figure 10: Primary wound closure.

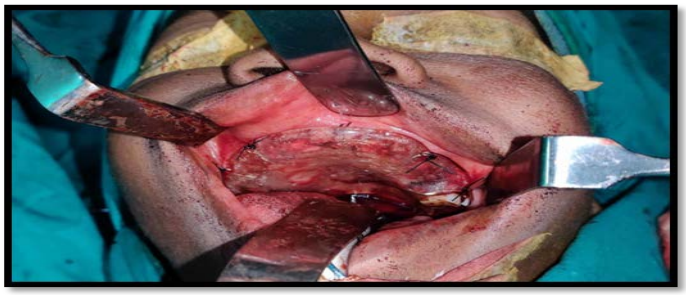

Figure 11: The placement of maxillary palatal plate .

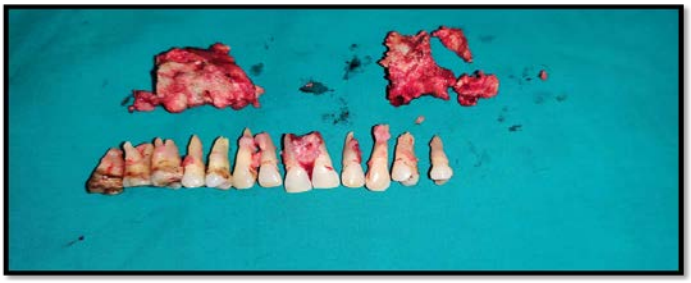

Figure 12: Extracted involved teeth with sequestrum of maxillary bone.

Histopathological examination

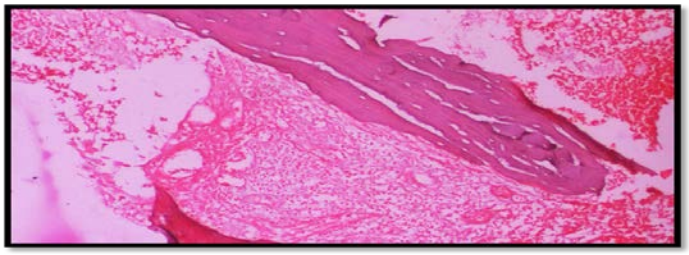

Figure 13: Histopathological section of the excised necrotic bone under 10x magnification, showing underlying connective tissue composed of dense bundle of collagen fibers with numerous inflammatory cells infiltrate predominantly lymphocytes and plasma cells.The decalcified section shows necrotic bone with empty lacunae and irregular border indicating bone resorption.

Figure 14: Postoperative healing after one month

Discussion

Osteomyelitis of the maxilla was first described by Rees in 1847. Osteomyelitis of the zygoma is very rarely encountered in clinical practice [7]. In the past, osteomyelitis of the jaws was frequently encountered in practice and was believed to have a poor prognosis due to a prolonged course, uncertainty of the outcome, and possible disfigurement resulting from the loss of teeth and bone [8].

Osteomyelitis of the jaws generally occurs as a result of one or more predisposing factors. These factors are associated with compromised vascular perfusion at a local, regional, or systemic level. Specific predisposing factors related to vascular insufficiency include diabetes; autoimmune diseases; agranulocytosis; leukemia; severe

anemia; syphilis; chemotherapy; corticosteroid therapy; sickle cell disease; acquired immunodeficiency syndrome; geriatric age group; malnutrition; smoking and alcohol consumption; radiotherapy; osteoporosis; Paget's disease of the bone; fibrous dysplasia; bone malignancy; and bone necrosis due to the exposure to bismuth, mercury, or arsenic [2].

Osteomyelitis can result from hematogenous seeding, contiguous spread of infection, or direct inoculation of microorganism(s) into intact bone [8].

In the present case, the main risk factor was poorly controlled diabetes mellitus. According to Peravali et al., 68% of the cases of maxillary osteomyelitis can be attributed to diabetes mellitus because hyperglycemia leads to changes in the blood flow distribution to the maxilla, thereby compromising the immune system [9]. Our patient was treated with intravenous antibiotics for two weeks and appropriate medications for glycemic control. The thick and well-vascularized palatal mucosa continued to remain intact even with maxillary necrosis spreading to the palate.

At the time of discharge, surgical maxillary plate was removed and healing was uneventful, and no wound dehiscence was noted as seen in (Figure 14). The excised necrotic maxillary bones were sent for histopathology examination, which confirmed the diagnosis of chronic osteomyelitis of the maxillary bones.

The histopathological examination in 10x magnification as showed in (Figure 13) showed the underlying connective tissue composed of dense bundle of collagen fibers with numerous inflammatory cells infiltrate predominantly lymphocytes and plasma cells. Extravasated RBC's and blood vessels are evident in section. The decalcified section shows necrotic bone with empty lacunae and irregular border indicating bone resorption. Marrow space between bony trabeculae are infiltrated with very few inflammatory cells.

After one month of follow-up, the patient had mild pain over the right zygomatic bone region.

Most of the infections are a result of polymicrobial oral flora, which includes facultative streptococci, Peptococcus, Bacteroides spp., and Peptostreptococcus [10]. The complete resolution of the infection occurs with a combination of surgical treatment and antibiotic therapy. The actinomycotic infection forms external sinuses that discharge distinctive sulfur granules and spreads unhindered by anatomical barriers [11] .A relapse rate of 20% is documented in the literature. The usual goal of therapy is the eradication of the infection and restoration of function [8].

The goal of definitive therapy is to attenuate and eradicate the proliferating pathogenic microorganisms and promote healing. The treatment guideline for osteomyelitis of the jaws includes the following measures.These are (a) disrupt the infectious foci, (b) perform debridement of any foreign body, necrotic tissue, or sequestra (sequestrectomy), (c) culture and sensitivity , identify pathogens for definitive antibiotic treatment, (d) drain and irrigate the affected region, (f) provide adjunctive treatment to enhance microvascular reperfusion (usually reserved for refractory forms only) via trephination, decortications, vascular flaps, or hyperbaric oxygen therapy; and (g) perform reconstruction, as necessary, after the resolution of the infection [12].

Conclusion

Adult osteomyelitis is considered difficult to treat, with considerable morbidity and burden on the health care system. The term "cure" is not used for osteomyelitis because of the possibility of recurrence of the infection even years after apparently successful treatment, in the event of new trauma to the involved area

or suppression of the host response to infection. The goal of the treatment would then by to arrest osteomyelitis, rather than achieve a complete cure. Our patient was followed up for two months but did not show any signs of recurrence after one month . It is significant to consider osteomyelitis of the jaw during the evaluation of immunosuppressed subjects since its treatment is challenging. In such cases, the infection may advance to involve the cranial cavity and the brain. Therefore, it is imperative to suspect the diagnosis early and ensure timely treatment with antibiotics. Glycemic control in diabetics is mandatory to prevent the recurrence of such infections. Thus, in this paper, we described our experience in the diagnosis and successful management of osteomyelitis of the maxilla in a patient with diabetes.

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