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Chronic Suppurative Osteomyelitis of the Mandible: Case Report and Review.

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Abstract: Osteomyelitis is a challenging disease for clinicians and patients despite the many advances in diagnosis and treatment. Chronic suppurative osteomyelitis (CSO) of the mandible is often considered difficult to treat. Several authors conclude that CSO can be treated successfully by a combination of intravenous antimicrobial therapy and surgery consisting of sequestrectomy or decortication, the recently advocated use of adjunctive treatment such as hyperbaric oxygen, gentamycin or tobramycin beads and heparin streptokinase infusion, supposedly lead to better results and suggest a substantial reduction in the number of refractory cases of CSO. This paper presents a relatively simple treatment in a case of chronic suppurative osteomyelitis along with a short review.
Keywords: Osteomyelitis, mandible, sequestrectomy

INTRODUCTION

Osteomyelitis is a challenging disease for clinicians and patients despite the many advances in diagnosis and treatment. Today osteomyelitis of the jaws is much less common due to improved nutrition, availability of antibiotic therapy, dental care, early diagnosis and intervention. The development of microorganisms resistant to commonly used antibiotics, immunocompromised individuals, lack of experience in managing the disease have made the effective management of osteomyelitis increasingly difficult.

Osteomyelitis is an inflammation of the bone and bone marrow that develops in the jaws usually after a chronic infection. It may be classified as acute, subacute or chronic, depending on the clinical presentation [1]. The primary cause of chronic osteomyelitis of the mandible is infection by odontogenic microorganisms. It may arise as a complication of dental extractions and surgery, maxillofacial trauma and subsequent inadequate treatment of a fracture and /or irradiation to the mandible[2].

Chronic suppurative osteomyelitis (CSO) of the mandible is often considered difficult to treat and has been reported to lead to pathologic fracture and even resection of the affected part of the mandible. Although several authors conclude that CSO can be treated successfully by a combination of intravenous antimicrobial therapy and surgery consisting of sequestrectomy or decortication, the recently advocated use of adjunctive treatment such as hyperbaric oxygen, gentamycin or tobramycin beads and heparin streptokinase infusion, supposedly lead to better results and suggest a substantial reduction in the number of refractory cases of CSO[3]. Unfortunately, the total number of reports on the treatment of CSO patients is limited.

The aim of this paper is to present the result of a relatively simple treatment in a case of chronic suppurative osteomyelitis.

CASE REPORT

A 35 year man was referred to the Department of Oral and Maxillofacial Surgery with a history of pus discharge from the cutaneous sinus on the right side of lower jaw since 5-6 months (Fig 1.). On examination, the patient was asymptomatic, afebrile, no regional lymphadenopathy, no paresthesia of lower lip and no reduced mouth opening. Though patient did not have any relevant medical history he appeared to be anemic. On intra-oral examination, the patient had a well maintained dentition with carious lower right first molar.

Investigations:

OPG, periapical and mandibular occlusal radiographs demonstrated a localized mottled area of mixed radiolucency /radio-opacity in the area of the right posterior body of the mandible and measured 16 mm at its greatest diameter. It extended from the roots

of the first molar to the inferior alveolar canal. A clinical diagnosis of CSO of the mandible was made.

Treatment:

Management entailed a two week course of oral clindamycin (300 mg p.o. q.i.d.) followed by removal of the tooth, surgical debridement of the affected area and resection of the cutaneous sinus tract utilizing intravenous sedation. (Fig 2). Histological samples and microbial cultures were also taken. Clindamycin was chosen because of its broad antibacterial coverage against anaerobic organisms, commonly present in chronic 'mixed' odontogenic infections and its established potential to penetrate well and achieve high therapeutic concentrations in bone.

Fig-1:Cutaneous sinus on the right side of lower jaw

Fig-2: Surgical debridement and resection of the cutaneous sinus tract.

Results:

Microbiological cultures showed normal oral flora and some aerobic Gram-negative bacilli, which were sensitive to clindamycin. The histopathology demonstrated chronic inflammation and fibrosis. These findings, in combination with the clinical picture, were consistent with chronic suppurative osteomyelitis. Repeat radiographs were taken after three months of surgery. There was no clinical or radiological evidence of residual infection.

In the present case, the patient was prescribed a four week course of oral clindamycin, which in combination with surgical debridement was successful.

DISCUSSION:

The methods of treatment of Chronic suppurative osteomyelitis as reported in literature are not uniform. Several authors suggest treatment protocols consisting of a combination of surgery and antimicrobial treatment but they report no results. In other reports surgery and antimicrobial treatment are not always combined or are not clear. Surgical treatment also varies from sequestrectomy and decortication to resection. The use of antimicrobial agents also differs widely. In the series of Koorbusch the number of different antibiotics used in a patient ranged from 1 to 5 with a mean of 2.3. The duration of treatment in this series was more than 60 days in 18 out of 35 patients, and even more than 180 days in 2 patients[4,5]. Topazian recommends to continue treatment for 2-4 months after resolution of symptoms, whereas Bartkowski et al [6] uses intravenous therapy for a period of 10-24 days.

As suggested in the literature, the duration of the process, the formation of granulation tissue and the presence of sequestra in almost all cases make surgery with simultaneous i.v. antimicrobial therapy mandatory in the treatment of CSO of the mandible. This combined therapy was applied, with only few exceptions according to a uniform protocol to the presented case with CSO of the mandible of dentoalveolar origin.

The aim of the surgery is elimination of all infected and necrotic soft and hard tissue. Incomplete curettage and sequestrectomy leads to persistence of the osteomyelitis, which may mistakenly be interpreted as resistance to therapy. In this case with limited osteolysis, a sequestrectomy was performed, followed by elimination of dead space and primary closure of the wound. The use of hyperbaric oxygen, often described as an adjunct in refractory cases, was not used in this case.

A protocol consisting of thorough surgical debridement of infected and necrotic tissue, supported by intravenous antimicrobial therapy for one week, followed by oral administration for three weeks, can lead to predictable, good results in cases of CSO of the mandible

REVIEW

Osteomyelitis is an inflammation of the medullary portion of the bone. However the process rarely is confined to the endosteum and usually affects the cortical bone and the periosteum[1] .Therefore osteomyelitis may be considered an inflammatory

condition of bone that usually begins as an infection of the medullary cavity which rapidly involves the haversian system and quickly extends to the periosteum of the area. The infection becomes established in the calcified portion of bone when pus in the medullary cavity and beneath the periosteum compromises or obstructs the blood supply. Following ischemia the infected bone becomes necrotic.

In 1970, Waldvogel described the first long bone osteomyelitis staging system[7]. He described 3 categories of osteomyelitis, as follows: hematogenous, contiguous focus and osteomyelitis associated with vascular insufficiency. Kelly[8] , Weiland[9] and Ger[10] gave their classifications. A simpler classification scheme characterizes osteomyelitis as: suppurative and non suppurative and as acute, subacute and chronic.

The low incidence of osteomyelitis of the jaws is remarkable considering the high frequency and severity of odontogenic infections. This low incidence is a result of fine balance between the host resistance and the virulence of the microorganism. In the jaws contiguous spread of odontogenic infections that originate from pulpal or periapical tissues is the primary cause of the disease. Infection from periostitis after gingival ulcerations, lymph nodes, infected furuncles or lacerations and hematogenous origin account for an additional small number in jaw ostemyelitis. Trauma, especially not treated compound fractures, is the second leading cause.

The virulence of the microorganisms in addition to any conditions altering the host defense mechanism and alteration of jaw vascularity are important in the onset and severity of ostemyelitis. Alchohol and tobacco use are frequently associated with osetomyelitis[4]. Conditions that alter the vascularity of bone predispose patients to develop osteomyelitis; those include: radiation, osteoporosis, osteopetrosis, Paget's disease, fibrous dysplasia, bone malignancy and bone necrosis caused by mercury, bismuth and arsenic. Systemic conditions that alter the host's resistance and influence profoundly the course of the disease include: diabetis mellitus, autoimmune disorders, agranulocytosis, anemia, especially sickle cell, leukemia, AIDS, syphilis, malnutrition, chemotherapy therapy for cancer, steroid drug use[5].
The extensive blood supply of the maxilla makes it less prone to ostemyelitis when compared to the mandible. The mandible in this aspect resembles long bones with a medullary cavity, dense cortical plates and well defined periosteum. The bone marrow is composed of sinusoids rich is reticuloendothelial cells, erythrocytes, granulocytes, platelets, osteblastic precursors as well as cancellous bone, fat tissue and blood vessels.

Appropriate collection and transportation of cultures are essential in accurate diagnosis and initiation of appropriate therapy. Repeated cultures, especially in cases of chronic osteomyelitis and chronic antibiotic therapy, are paramount for identification and isolation of the involved pathogen. Staphylococcus Aureus and epidermis were until recently, estimated to be involved in jaw osteomyelitis 80-90% of the times. With more sophisticated methods of collection and appropriate handling of cultures a-hemolytic streptococcus is recognized as the primary organism along with oral anaerobes e.g. Peptostreptococcus, Fusobacterium and Provotela species[11].

Plain radiographs are relatively inexpensive, may be used to make the diagnosis, help in interpreting and choosing other studies, and allow one to exclude other conditions. The primary findings are different in chronic osteomyelitis, which is characterized by bone sclerosis, periosteal new bone formation, and sequestra. CT scan is used to evaluate an area in which focal findings are present on examination and plain films findings are negative. The CT scan (with and without contrast) is very accurate for detecting cortical destruction, intraosseous gas, periosteal reaction, and soft tissue extension[12].

MRI is an alternative to CT scan. MRI provides useful anatomic detail in planning for surgical debridement, since it may show abscesses that need drainage, and can reduce the risk of operating on bland cellulitis.

Chronic Suppurative Osteomyelitis requires surgical procedures in addition to antibiotic treatment[13]. Antibiotic therapy should be initiated with intravenous administration of medications usually Ampicillin and Sulbactam for 2 weeks or until patient is showing improvement for 48-72 hours. Oral therapy should be continued for 4-6 weeks after the patient has no symptoms or from the date of the last debridement.

Closed wound irrigation-suction therapy is especially helpful when determination of the extent of chronic infection of residual bone cannot be determined.

Antibiotic – Impregnated beads are used to deliver high concentrations of antibiotics into the wound bed and in immediate proximity to the infected bone. The beads release high local concentrations, but low systemic concentrations thus reducing the risk of toxicity.

Hyperbaric oxygen therapy been used to promote healing in refractory chronic ostemyelitis. Wound healing is a dynamic process that requires an adequate oxygen tension to proceed. In the ischemic or

infected wound, hyperbaric oxygen therapy provides oxygen to promote collagen production, angiogenesis, and ultimately wound healing[14,15].

Surgical treatment as an adjunct to medical management is usually necessary. This may proceed to sequestrectomy with or without saucerization, decortication resection and then reconstruction[13]. Treatment of systemic conditions and supportive therapy consisting of high protein, high vitamin diet with adequate hydration should be instituted simultaneously.

Debridement surgery is the foundation of osteomyelitis treatment. It is the most commonly performed procedure and may need to be repeated multiple times. The goal of debridement is to reach healthy, viable tissue. Saucerization is the unroofing of the bone to expose the medullary cavity. This is useful in chronic osteomyelitis, since it permits excision of sequestra either formed or forming ones. First introduced in 1917 and further described by Mowlem, decortication involves removal of the chronically infected cortex; usually the buccal and the inferior border are removed 1-2cm beyond the affected area. It can be used as initial treatment of primary or secondary chronic ostemyelitis or more commonly when initial conservative treatment has failed.

Resection and reconstruction may be required for low- grade persistent or chronic ostemyelitis. It is especially used in cases of persisted infection after decortication, marked disease involving both buccal and lingual cortices and in cases of pathologic fractures.

REFERENCES

1. Bernier S, Clermont S, Maranda G, Turcotte JY; Osteomyelitis of the jaws. J Can Dent Assoc, 1995;61(2): 445-448
2. Hudson JW; Osteomyelitis of the jaws: a 50-year perspective. J Oral Maxillofac Surg, 1993; 51:1294-1301.
3. Van Merkesteyn JP, Groot RH, Van Den Akker HP, Bakker DJ, Borgmeijer-Hoelen AM;Treatment of chronic suppurative osteomyelitis of the mandible. Int J Oral Maxillofac Surg, 1997 ;26(6):450-454.
4. Koorbusch GF; How can we diagnose and treat osteomyelitis of the jaws as early as possible?. Oral and Maxillofacial Surgery Clinics of North America, 2011; 23(4): 557–567.
5. Koorbusch GF, Fotos P, Goll KT; Retrospective assessment of osteomyelitis: etiology, demographics, risk factors, and management in 35 cases. Oral Surg Oral Med Oral Pathol, 1992;74:149-154.
6. Bartkowski SB, Heczko PB, Lisiewicz J, Dorozynski J, Kurek Mal, Kusmiderski J et al.; Combined treatment with antibiotic, heparin and streptokinase — a new approach to the therapy of bacterial osteomyelitis. Journal of Cranio-Maxillo-Facial Surgery, 1994; 22(3): 167-176.
7. Waldvogel FA, Medoff G, Swartz MM; Osteomyelitis: A review of clinical features, therapeutic considerations and unusual aspects. N Engl J Med, 1970; 282:198–206, 260–6, 316–322.
8. Kelly PJ; Infected nonunion of the femur and tibia. Orthop Clin North Am, 1984;15:481–490.
9. Weiland AJ, Moore JR, Daniel RK; The efficacy of free tissue transfer in the treatment of osteomyelitis. J Bone Joint Surg Am, 1984; 66: 181–193.
10. Ger R; Muscle transposition for treatment and prevention of chronic post- traumatic osteomyelitis of the tibia. J Bone Joint Surg Am, 1977;59: 784–791.
11. Mackowiak PA, Jones SR, Smith JW; Diagnostic value of sinus tract cultures in chronic osteomyelitis. JAMA, 1978; 239:2772–2775.
12. Christopher JS, Lawrence BC; Radiographic imaging in osteomyelitis: The role of plain radiography, computed tomography, ultrasonography, magnetic resonance imaging, and scintigraphy. Semin Plast Surg, 2009; 23(2): 80–9.
13. Rao N, Ziran BH, Lipsky BA; Treating osteomyelitis: antibiotics and surgery. Plast Reconstr Surg, 2011;127 Suppl 1:177S-187S.
14. Mader JT, Adams KR, Wallace WR, Calhoun JH; Hyperbaric oxygen as adjunctive therapy for osteomyelitis. Infect Dis Clin North Am,1990; 4(3):433-440.
15. Calhoun JH, Cobos JA, Mader JT; Does hyperbaric oxygen have a place in the treatment of osteomyelitis?. Orthop Clin North Am, 1991;22(3):467-471.