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CASE REPORT

Odontogenic infection complicated by sepsis: A case report

Infección odontogénica complicada con sepsis: el reporte de un caso

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ABSTRACT

Case description: female patient, 43 years old, admitted to the emergency department of the Hospital San Juan de Dios de Cali, on September 9, 2023, with signs suggestive of infection of odontogenic origin.
Clinical findings: moderate edema in the lower left facial third and zones I, II, and III of the left hemicollar, extraoral fistula, limitation of opening, swollen mucosa of tooth 35, with bloody-purulent exudate and associated alveolar bone exposure.
Treatment: intraoral drainage, accompanied by antibiotic and analgesic therapy, with intravenous clindamycin and dexamethasone, respectively.
Result: Resolution of the odontogenic infectious process.
Conclusion: antibiotic therapy with clindamycin or combined amoxicillin/clavulanate is a useful treatment alternative in dentoalveolar infections.

CLINICAL RELEVANCE

The literature has demonstrated the powerful antimicrobial activity of penicillins against the main pathogens in orofacial odontogenic infections. Case reports such as this one corroborate once again that antibiotic therapy with clindamycin, or combined amoxicillin/clavulanate is a useful treatment alternative in dentoalveolar infections.

INTRODUCTION

The definition of infection and sepsis has been variable over time, since the beginning of the use of these terms there have been multiple consensuses and debates about the most appropriate definition and its severity.[1] An infection is the harmful proliferation of one or several microorganisms (bacteria, viruses, fungi, and/or protozoa) in a host, and/or the set of signs and symptoms produced in that host by the dissemination and virulence of pathogenic or opportunistic germs.[2] In Colombia, the definition of sepsis proposed by the American College of Chest Physicians (ACCP) and the Society of Critical Care Medicine (SCCM) in 1992 was adopted and represents the systemic inflammatory response syndrome associated with an infection.[3]
Facial infections can be odontogenic and non-odontogenic. Odontogenic infection is the one that occurs most frequently in the orofacial region and has affected mankind for centuries, it varies from peripheral abscesses to superficial and deep infections that affect the head and neck,[4] these infections can have origin in the teeth or in the dental support structures, and are the result of pathologies such as extensive caries, pulp necrosis, dental fractures, periodontitis or pericoronitis. The most important symptoms and signs are pain, heat, redness and inflammation and in some cases the functions of mastication, phonation, swallowing and trismus may be affected.[5]

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Most of these infections produce pus that drains through the oral cavity, however, it can spread to important structures such as: the maxillary sinus, sublingual, submandibular, infraorbital regions and, in more severe cases, involve the orbit, brain or mediastinum, through aponeurotic spaces via hematogenous, nervous, lymphatic and/or dissect specific anatomical spaces in the face and neck and drain extraorally. [5] In the English literature, the submandibular space is most frequently observed to be involved in multiple space infections, followed by the lateral pharyngeal space, buccal space and submental space.[6]
The main etiological microorganisms in facial infections of odontogenic origin are aerobic bacteria like *Streptococcus viridians*, *Staphylococcus aureus*, *Staphylococcus coagulasa*-negativo, y organismos de los géneros *Corynebacterium*,, *Klebsiella* y *Enterobacter*, *Pseudomonas aeruginosa*; o anaerobios como *Peptostreptococcus*, *Bacteroides*, *Fusobacterium*, *Prevotella* y *Porphyromonas*, among others. [2-7]
Identifying the microorganisms involved in infections and their antibiotic or antifungal sensitivity profile allows rationalizing treatments and improving prognosis.[4]

Bacterial identification should be performed by an experienced microbiologist to classify pathogenic organisms accurately if identified by culture, and another possible way today is to use rapid molecular detection tests using polymerase chain reaction or massive sequencing or metagenomics systems that are very expensive and not accessible to regular clinical services. There are several factors that alter the results of microbiological testing, including the use of antibiotics prior to admission, high doses of intravenous antibiotics prior to surgical drainage, inadequate specimen collection, and difficulty in culturing and identifying anaerobic organisms. [4]

The speed of spread of the infection of odontogenic origin depends mainly on the bacterial virulence, the immunity of the individual and the failure of diagnosis and timely treatment that together can increase the severity of the infection, because there is dissemination through the anatomical spaces of less resistance such as the bone cortices and muscle fasciae.[5]

The treatment of these infections depends on the structures involved, generally it starts with the drainage of the abscess and the empirical prescription of broad-spectrum antibiotics, and treat the cause of the infection with the most indicated therapy, which in some cases may be dental extraction. It is essential to consider medical consultation when the patient has a poorly controlled systemic disease, or a history of bacterial endocarditis and/or airway compromise.[7] The objective of this article is to present a case treated by the Oral and Maxillofacial Surgery Service at the San Juan de Dios Hospital in Cali in September 2023.

DESCRIPTION OF THE CASE

The patient is a 43-year-old female with no relevant pathological history, who was admitted to the emergency department of the Hospital de San Juan de Dios on September 9, 2023 due to an increase in volume in the submandibular region (Figures 1, 2 and 3), associated with pain and spontaneous drainage of extraoral purulent material. As an important antecedent, he reports trauma at mandibular level with a blunt object that occurred approximately on August 25, 2023, and was initially managed in a high complexity hospital. On physical examination he presented moderate edema involving the lower left facial third and zones I, II and III of the left hemicollar, extraoral fistulous tract at the level of the ipsilateral mandibular body, without spontaneous drainage (Figure 4), at intraoral level there was evidence of limitation of opening, with an opening of 30 mm, and in tooth 35 (lower left premolar) there was retained dental root associated with mucosa with signs of inflammation, bloody-purulent exudate and exposure of the alveolar bone (Figure 5).

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Figure 1. Frontal view, moderate edema can be seen in the lower left facial third.

Figure 2. Left lateral view shows fistulous tract in the left mandibular body area without active drainage.

Figure 3. Frontal view lower third.

Figure 4. Extraoral fistula.

Figure 5. Intraoral view, showing poor oral health, multiple caries and dental losses, alveolar ridge in quadrant 3 exposed with drainage of purulent material.

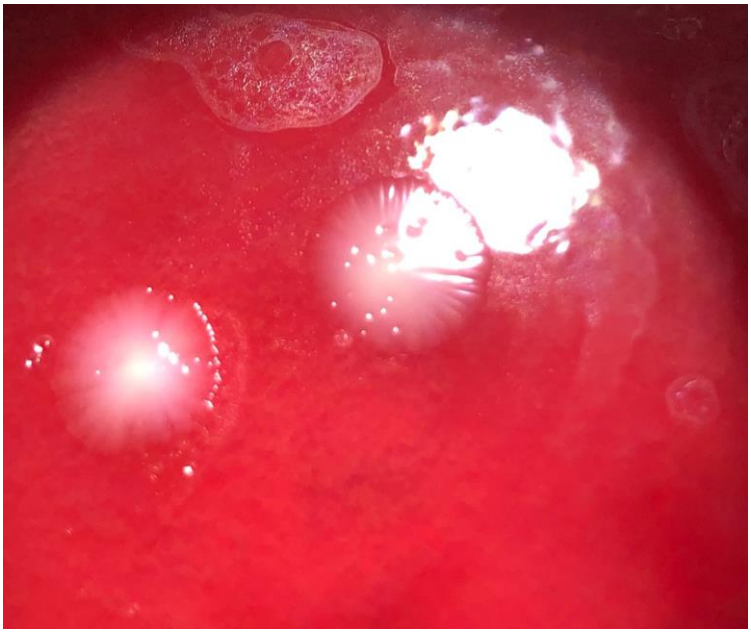

Figure 6. culture with the presence of anaerobic Streptococcus, sensitive to amoxicillin and clindamycin.

Initial emergency management consisted of intraoral drainage where approximately 3cc of seropurulent material was obtained, antibiotic and analgesic therapy was started as follows: Intravenous Clindamycin 600mg/4ml one every 8 hours for 7 days, Intravenous Dexamethasone 1mg/4ml one every 24 hours for 4 days, and subsequently a CT scan of the face was ordered showing a heterogeneous density area in the left mandibular body compatible with osteomyletic signs and perimandibular soft tissue involvement, Therefore, it was decided to perform hemimandibulectomy, bone curettage, lavage and debridement, exploration and mobilization of the dental nerve, and mandibular reconstruction with plate.

DISCUSSION

Gilmore et al. reported that strict anaerobic resistance to penicillins ranges between 8.9 and 16%, depending on the gender involved.[8] Amoxicillin still shows a high level of activity against most oral anaerobes and other studies have shown that 90% of gram-positive cocci and 79% of gram-negative bacilli are susceptible to amoxicillin. The addition of beta-lactamase inhibitors, such as clavulanate, to broad-spectrum penicillins has expanded the antimicrobial spectrum of the parent agents to include many beta-lactamase-producing bacteria, including most beta-lactamase-producing anaerobes.[9,10]

In this case report, the isolated streptococcal strains were susceptible to amoxicillin/clavulanate; and as a result, it appears to be the most effective option in the treatment of dentoalveolar infection. Kuriyama et al. reported that Streptococcus viridans has a susceptibility rate of 77% to penicillin, 87% to clindamycin, 77% to erythromycin, and 92% to levofloxacin.

In conclusion, anaerobic Streptococcus, which are gram-positive anaerobic cocci, could be identified in this case of orofacial odontogenic infection. An antibiogram demonstrated that amoxicillin/clavulanate and clindamycin have powerful antimicrobial activity against the main pathogens in orofacial odontogenic infections, as useful alternatives for the treatment of dentoalveolar infection.

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CONFLICT OF INTEREST

The author declares that he has no conflict of interest.

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