# Severe odontogenic infection: past or reality? a case series report

## Infecções odontogênicas severas: passado ou realidade? relatos de casos clínicos

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**ABSTRACT**

Odontogenic infection is still a reality of the oral cavity, consequence of lack of access to preventive odontology, of bad treatment when the case is at the beginning or of ignorance about the complication associated to this infection. In this context, moderate and severe infection is a common occurrence in Clinical Dentistry, where septic tooth infection in patients with or without systemic alterations may lead to surgical procedures which are expensive for the public and private health system. The goal of this article is to present a series of clinical cases of odontogenic infection (moderate and/or severe) treated in Oral & Maxillofacial Surgery hospitals, presenting and discussing the many immediate and mediate forms of treatment, and also the possibility of preventive care.

Keywords: Soft Tissue Infections; Cellulitis; Abscess; Odontogenic space infection.

**INTRODUCTION**

The treatment of serious odontogenic infections is still part of the routine of the Oral and Maxillofacial surgeon, even after all the progress made in Odontology. Its origins and evolution pass by primary care and, invariably, by the Dental Surgeon working in clinical dentistry. When not treated at the correct moment, the presence of teeth with extensive coronary destruction due to cavities, the chronic presence of radicle remains without endodontic treatment, pericoronitis in partially erupted teeth, association to odontogenic pathologies in infectious-inflammatory processes and periodontal abscess may become infectious[1-6]. This scenario worsens when the patient presents immunodeficiency disorders or other uncontrolled systemic pathologies,[3,4] and also, in pediatric patients, immature immune systems, which make the infectious process very fast, and the treatment more difficult, with doubtful prognosis when left untreated[2].

The diagnosis of odontogenic infections is done clinically through signals and symptoms and the research of its etiopathology, complemented by imagiology of the affected region[6-8]. More important situations, presenting dyspnea and dysphagia, are evaluated using computed tomography as to identify the progression of the infectious process[9-11], and hematological tests for determining individual systemic condition, evaluating leukocyte count, and searching for pathologies which were not found through anamnesis and clinical examination[12].

The treatment of this pathology is done using antibiotics to stop the progression of the infection. The culture tests and antibiogram must be done as early as possible, respecting a minimal time due to time necessary for the test itself[1,6]. Antimicrobial therapy comprehends a high number of bacterial pathogens, both anaerobic and aerobic. Surgical drainage is also performed when necessary[7,8].

Today we have resources that allow early diagnosis and identification of pathogens, making specific antibiotic therapy possible. Removing the cause of the pathogen and treating signs and symptoms is also made effective. This causes the decrease of incidences of big complications, which are practically unheard of in developed countries and in those where there is an effective preventive oral health police. However, these more serious pathologies, which attack deep fascia and evolve rapidly, are still a reality in the universe of oral cavities infectious processes[1,13-15], especially in underdeveloped countries that have a portion of low-income population that had limited access to health care, and also for lack of self-care[16,17].

This article will relate a series of clinical cases of odontogenic infections, moderate and severe, treated in hospitals with services of Oral & Maxillofacial Surgery. The cases will be presented and the many forms of immediate and mediate treatment available will be discussed, as well as the possibility of previous preventive care.

**CLINICAL CASES**

***Clinical Case 1***

28-year-old patient, male, Leokoderma, ASA I, went to the emergency room at Santa Casa Hospital in Sant´Ana do Livramento, RS, Brazil. He complained of a sudden increase of volume of the left submandibular region, with purulent collection

near the neck (FIGURE 1). He denied having any kind of allergy or other systemic alterations to his knowledge, and also denied having done any previous odontological work at the hospital. He only mentioned a third molar present in the region, which had been painful for a long time. The exam showed lack of discharge, severe trismus, regular oral hygiene, and pain during palpation associated to increase of volume concentrated in the submandibular region, near the neck, without fluctuation and with disseminated erythema. Hematological tests were done and presented increase of leukocytes, suggesting that an infectious process was active, which was compatible with the clinical situation presented. The patient had a prescription from another hospital, indicating the use of Azythromycin 500g, orally, every 24h for 3 days; and Nimesulide 100mg, every 12h for 3 days. At this moment the patient was admitted and a round of intravenous antibiotic therapy was begun, with Clindamycin 600mg every 8h and Ceftriaxone 1g every 24h, totaling 10 days of use of these medicines. On the second day in the hospital, due to the rapid evolution and collection of the infectious process, which was disseminating towards the neck and causing erythema on the neck and torso, an extraoral drainage was done using a penrose-number-2 drain; this lasted 3 days. Material was collected for culture and antibiogram, but the results were inconclusive, and there was not any bacterial growth. There was recommendation of using of bandages and washing of the surgical wound using 2% chlorhexidine gluconate, mouthwashing using 0,12% chlorhexidine gluconate, and endovenous antibiotic and painkiller therapy. After seven days of drainage, while the patient was still admitted, tooth 38 was removed surgically. The patient was discharged 10 days after admission, without complications.

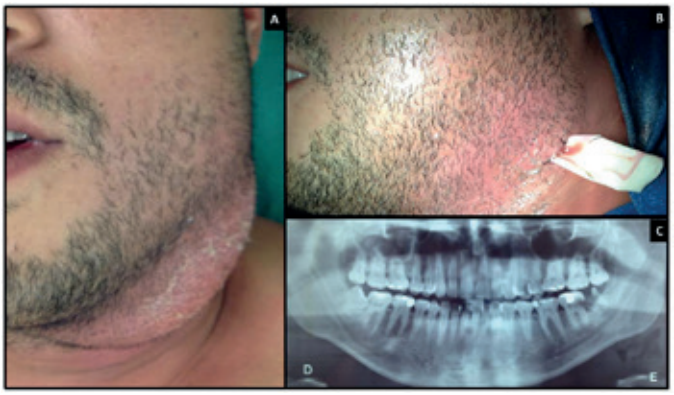

**Figure 1** – Odontogenic infection caused by deep cavity and peridiodontal abscess on teeth 38. A) Abscess located on the left submandibular region with purulent collection of around 100ml. B) Drainage of the abscess and installation of a penrose drain, kept by sutures. C: Panoramic X-ray for the location of the cause of the infection.

*Clinical Case 2*

35-year-old patient, female, Leokoderma, ASA II, went to the emergency room at Santa Casa Hospital in Sant´Ana do Livramento, RS, Brazil. She presented sudden increase of volume of the right bottom region of the face for 5 days (FIGURE 2). She denied having any allergies and related systemic hypertension and untreated type II diabetes, without any medical follow-up for the past 5 years. The clinical exam showed small discharge of intraoral suppuration, moderated trismus, inadequate oral hygiene and pain during palpation. The physical exam showed the increase of volume was not very depressive, woody in some places, concentrated on the submandibular region near the neck, without fluctuation points. Hematological tests were done and showed an increase in leukocytes and high glycemia. During the evaluation done at the clinic, arterial pressure was at 180x110 mmHg, and HGT at 335 mg/dl. The doctor prescribed Captopril 50mg once a day, for continuous use; Hydrochlorothiazide 50mg, once a day; and regular insulin for regulating glycemic count. Antibiotic therapy was done intravenously using Clindamycin 600mg every 8 hours and Ceftriaxone 1g every 24 hours, totaling 10 days of treatment. Bandages and cares for the surgical wound were recommended. After 5 days of hospital admission an extraoral drainage was done, using a penrose-number-2 drain, lasting 3 days. After 10 days of admission the removal of tooth 48 was recommended and the patient was discharged, without complications.

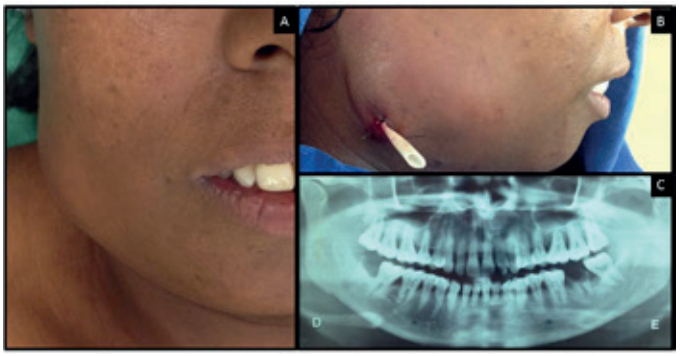

**Figure 2** – Increase of volume with purulent collection on the right mandibular region. A) Initial clinical aspect at the moment of arrival of the patient to the surgical center. B) Extraoral drainage of the submandibular abscess and installation of a penrose drain. C) Panoramic radiographic aspect and location of the septic teeth.

*Clinic Case 3*

8-year-old patient, female, Leukoderma, ASA I, brought by her supervisors to the emergency room at Santa Casa Hospital in Sant´Ana do Livramento, RS, Brazil. Complained of sudden increase of volume in the left hemifacial for 3 days, prostration and fever (FIGURE 3), and denied any allergies. The clinical exam showed brief discharge of intraoral suppuration, severe trismus, deficient oral hygiene and pain during palpation. The physical exam showed the increase of volume was not very depressive, woody in some places, concentrated on the submandibular region near the neck, without fluctuation points. Hematological tests were done and showed leukocytosis. The panoramic radiography showed presence of cavities and coronary destruction of many deciduous teeth, compromising of the pulp and clear periapical periodontitis on teeth 46 and 36 – the last one being the probable cause of the abscess. Because intraoral discharge was active at the time of admission, endovenous antibiotic therapy was recommended and used Cephalexin 500mg every 8h for 7 days, Lincosamide 600mg every 12h for 7 days, and 0,12% chlorhexidine gluconate mouthwash. On the 6$^{th}$ day the deciduous teeth that presented cavities and coronary destruction were extracted, and endodontie of teeth 36 and 46 was started. 10 days after admission, the increase in volume had completely disappeared and intraoral suppuration had stopped. The patient was discharged.

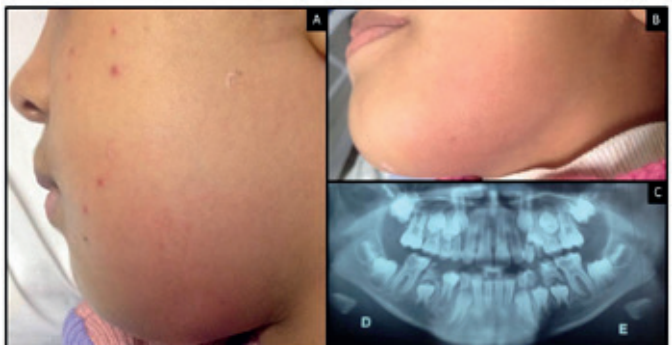

**Figure 3** – Pediatric patient went to the ER complaining of increase of volume of the face, fever, trismus and pain. A) Clinical signals of face infection, with local erythema and increase of submandibular volume compatible with odontogenic infections. B) Final aspect after the treatment with antibiotic therapy and surgical removal of the septic teeth. C) Panoramic X-ray confirming the presence of dental remains with cavities and permanente teeth with visible periapical alterations.

*Clinical Case 4*

67-year-old patient, male, Leokoderma, ASA 1, no allergies, went to the emergency room at Santa Casa Hospital in Sant´Ana do Livramento, RS, Brazil, complaining of sudden increase of hemifacial volume for the past 6 days (FIGURE 4). He did not report any systemic alterations; however, he had not done any type of medical follow-up for the past 20 years. The clinical exam showed spontaneous purulent extraoral discharge in the right submandibular region, tismus, precarious oral hygiene, presence of many septic teeth, and pain during palpation. The physical exam showed the increase in volume was depressive, woody in some places, with fluctuation points and active suppuration discharge. Hematological tests showed leukocytosis. The patient reported taking Amoxicillin 500mg + Clavulanic acid 125mg, orally, every 8h, for 7 days; but there was not any improvement of his condition, only spontaneous discharge of his abscess after applying hot compresses to the region. Panoramic radiography showed presence of radicular remains in tooth 46, which caused his condition, and also other septic teeth that should be removed surgically. Antibiotic therapy was done using Clindamycin 600mg, intravenously every 8h for 10 days; Levofloxacin 740mg, intravenously every 24h for 10 days; use of 0,12% chlorhexidine gluconate mouthwash; and cares for the surgical wound. After 10 days of admission, the septic teeth were removed surgically. The patient was discharged without complications.

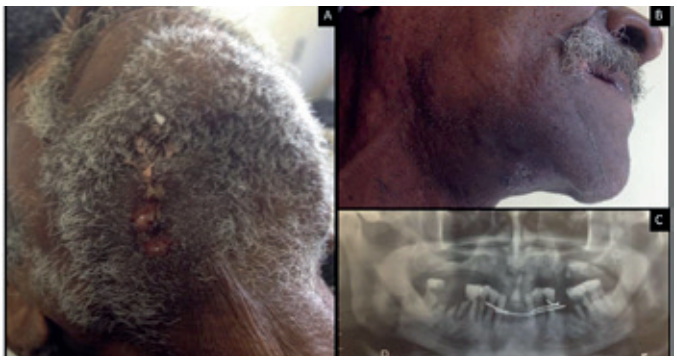

**Figure 4** – Elderly patient complaining of increase of right submental volume. A) Point of palpable fluctuation on the submental region with brief suppuration discharge. B) Post-op aspect of the surgical removal of septic teeth and total elimination of the purulent contents through hygiene of the local, and also through intravenous antibiotic therapy. C) Panoramic radiography used as a complimentary resource for determining the diagnosis.

*Clinical Case 5*

28-year-old patient, male, Leokoderma, ASA I, no allergies (FIGURE 5), went to the ER in Pelotas, Rio Grande do Sul, Brazil. Complained of increase of cervical and submandibular volume, on the right side, for the past 3 days, prostration and fever. Related extraction of the third molar 5 days before, with post-op prescription of intramuscular benzathine penicillin. He also related dysphagia and dyspnea when in the supine position. The clinical exam showed diffuse increase of extraoral volume involving oral, submandibular and lateral cervical fascial spaces, with hardened consistency, erythematous coloring, severe trismus, pain during palpation and absence of fluctuation points. Hematological exams showed leukocytosis. Radiographic tests showed the cavity of tooth 48 was empty, which was compatible with the recent extraction. The patient was admitted and intravenous antibiotic therapy was done using Clindamycin 600mg every 8h. Extraoral surgical drainage was performed using a penrose-number-2 drain during 3 days. 0,12% chlorhexidine gluconate mouthwash and cares for the surgical wound were recommended. The patient was discharged after 7 days in the hospital, without complications. 15-day follow-up showed the drainage incision was closed and the patient was fine.

**Figure 5**– Young-adult patient with high increase of volume of the right submandibular region after extraction of the third right molar. A) Clinical aspect at the moment of surgical drainage, with high increase of volume, regional erythema, trismus and dyspnea. B) Surgery, with divulsion of the tissues and drainage of the purulent content. C) Installation of a drain using sutures for maintaining the position. D) Post-op aspect after 30 days, only a scar on the region that was treated, no local edema or discharge of any content.

## DISCUSSION

Odontogenic infections are acute infectious-inflammatory processes that deserve important care during treatment[18]. This article described a series of moderate and severe cases, and the treatments prescribed. This study shows it is common the patient will go to emergency rooms already medicated, many time with the wrong medicine, which favors bacterial resistance and makes treatment more difficult[1,16,17]. The fast evolution of the infectious process was due to inadequate antibiotic therapy in

primary care, to subdosage, to the way medicine was administered, to lack of basic oral care and to non-removal of the cause of condition.

Serious infections of face, head and neck are caused by lack of primary odontologic care, and could be treated earlier. If so, harm to the organism, high treatment costs and unnecessary occupation of hospital beds would be avoided[19,20]. In this study, the period of hospital admittance varied from 7 to 10 days due to the cycle of antibiotic therapy, but it could be even longer in case additional surgical procedures need to be done[7,8].

Confirming what we observed in this study, the etiopathogeny of most face infections occurs because of septic teeth, extensive cavities with pulp necrosis, and active periapical processes like pericoronitis and others[9,18]. All these factors could be eliminated previously in odontological routine procedures, or avoided with public polices and prevention protocols, which would cost less for the patient and the government[20]. However, overcrowding of hospitals and treatment centers is still a reality in countries that do not have a system of education that privileges preventive health care.

The diagnosis of odontogenic infections and its causes is done clinically, and can be complimented by periapical radiographies[11], or, in the case of severe trismus, by panoramic and extraoral radiographies, which give a general evaluation of teeth and bones, which is very useful not only because of how fast it is done, but also because of the quality of the image.10 In graver cases, X-ray computed tomographies are recommended[9-11] for delimitating the area affected by the infection and evaluating its dissemination with precision. In the cases presented here, due to the necessity of rapid access to the images for odontological evaluation, required panoramic radiography, and CTs in the more severe cases, for planning drainage and the elimination of the whole purulent content present under bone and muscular tissue.

A therapeutic approach is very important for the correct evolution of the clinical case, and should be done as early as possible, especially in severe cases. The most common treatment for odontogenic infections is a cycle of antibiotics, with the spectrum that is most adequate to the bacterial pathogens which are present, associated to the procedure of elimination of the cause[1,6,7]. This last one consists of the surgical removal of the septic tooth, endodontic therapy, periodontal treatment or an association of the treatments mentioned above[3-5,8,17]. Many cases also demand an urgent approach, like surgical drainage and the installation of a drain for creating a way for rapid elimination of the accumulated purulent secretion, modification of the bacterial flora found through airing of the affected area and oxygenation of the tissues involved[5-8].

The existing literature[1,2,14,16] and the cases related here show that patients suffering from chronic systemic alterations which are many time untreated, such as hypertension, diabetes or viral pathologies, make it easier for infections to progress to fascial spaces, making the recovery of the patient and positive evolution of the case more difficult. Under these conditions, the case goes beyond the treatment of the infectious process: the health of the patient has to be controlled systemically.

This article presented a series of clinical cases of odontogenic infections, both moderate and severe, and their diagnoses and treatments in a hospital. It is important to point out that these infectious processes are easily avoidable through preventive care, primary oral hygiene and access to early treatments. However, when the infection is already installed, the medical approach must be decisive and brief, associated to adequate pharmacological therapy and surgery, removing the cause of the condition and, in case it still persists, drainage should be performed as early as possible.

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**RESUMO**

As infecções odontogênicas ainda são uma realidade no universo dos processos infecciosos da cavidade bucal, sendo consequentes às dificuldades de acesso à Odontologia preventiva ou pela má condução clínica quando o caso ainda está em fase inicial e, ainda, por desconhecimento das complicações associadas a estas infecções. Neste contexto, situações de infecções moderadas a severas ocorrem diariamente nos serviços de Odontologia Hospitalar, onde a manutenção de dentes sépticos por longos períodos podem levar, em pacientes com ou sem alterações sistêmicas, a tratamentos cirúrgico-medicamentosos de elevado custo para o sistema público e privado. Dessa forma, este artigo tem por objetivo apresentar uma série de casos clínicos de infecções odontogênicas (moderadas e/ou graves) tratados em serviços hospitalares de Cirurgia e Traumatologia Buco-Maxilo-Faciais, apresentando e discutindo as diversas formas de tratamento imediata e mediata, como também, as possibilidades de cuidados prévios ao seu acometimento.

PALAVRAS-CHAVE: Infecções dos Tecidos Moles; Celulite; Abscesso; Controle de Infecções Dentárias.

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