

CLINICAL AND SURGICAL MANAGEMENT OF LUDWIG'S ANGINA: CASE REPORT

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Abstract: Ludwig's angina is a diffuse cellulitis, which affects the submandibular, sublingual and submental spaces, the main cause is of odontogenic origin, related to teeth in the jaw. It has the ability to spread through the tissues quickly, being considered a high risk to the patient's life, it must be treated as an emergency, having as main conduct the maintenance of the airways, due to the elevation of the mouth floor and tracheal deviation. Neglect of treatment can result in a number of complications. The objective of this article was to report the clinical and surgical management for the resolution of a case of Ludwig's Angina, whose patient sought hospital care due to facial edema, trismus, odynophagia and dyspnea. In view of the exposition of this clinical case, we intend that there is greater awareness of the need for the treatment and diagnosis of this lethal pathology as soon as possible, serving as an example a case that was conducted effectively, restoring the patient's health status.

Keywords: Dental Focal Infection; Ludwig's angina; Suppuration.

INTRODUCTION

Ludwig's Angina is described as a gangrenous and necrotizing cellulitis characterized by the involvement of the perimandibular fascial spaces bilaterally (submandibular and sublingual) and submental. It has a rapid evolution and high mortality rate, with a risk of progression to mediastinitis, airway obstruction and septic shock, if not diagnosed and treated assertively. The bacterial flora involved in the suppurative process is mostly composed of a mixed flora composed of anaerobic and aerobic bacteria. Through the antibiogram exam it is possible to identify the sensitivity profile of the bacteria to indicate the ideal antibiotic^{1,2,3}.

CASE REPORT

Patient L.C.A., male, 29 years old, born in Bahia and Caucasian. He sought hospital care with a main complaint of increased volume in the face for 2 days, referred pain in tooth 48 with extensive caries lesion and indication for extraction. The condition evolved with facial edema, trismus, odynophagia and dyspnea, claimed a febrile episode on the previous day of 38.5°C. He declared to be a chronic smoker, consuming 2 packs of cigarettes a day. When asked about his past medical history, he denied allergies, use of medications and underlying pathologies.

On general physical examination, the patient was in a regular general condition, contacting, dyspneic, afebrile at the time of the examination, walking and conscious. On extraoral physical examination, bilateral submandibular and submental edema was observed, hardened on palpation with local hyperemia, without floating point and trismus (figure 1). As for the intraoral physical examination, dental element 48 was observed with extensive carious lesions and difficult visualization due to trismus, elevation of the mouth floor and no floating point (figure 2).

The conduct adopted was patient hospitalization, request for laboratory tests (complete blood count), request for Face Tomography (CT) that showed the presence of secretion in the bilateral and submandibular and sublingual fascial spaces (figures 3 and 4), in addition to evolution to cervical space with tracheal deviation (figures 5 and 6).

It was found that the patient had a deviation of the trachea, which justified the dyspnea, for the correct maintenance of the airways, the patient underwent fibroscopy for orotracheal intubation.

The prescribed drug protocol consisted of corticoid (pulse therapy), antibiotic ceftriaxone 1g every 12 hours. The surgical



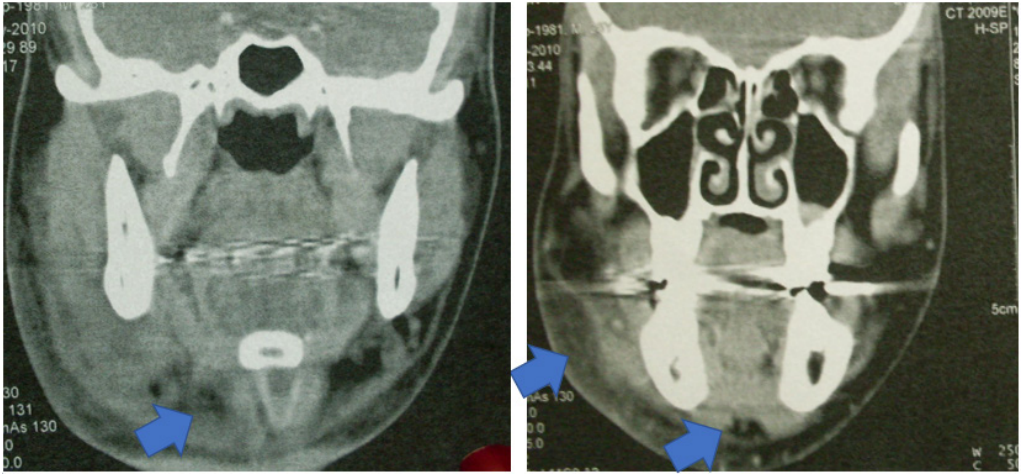
Figure 1 - extraoral physical exam

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Figure 2 - intraoral physical exam

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Figures 3 and 4 - CT showing accumulation of secretion in the submandibular and submental fascial space

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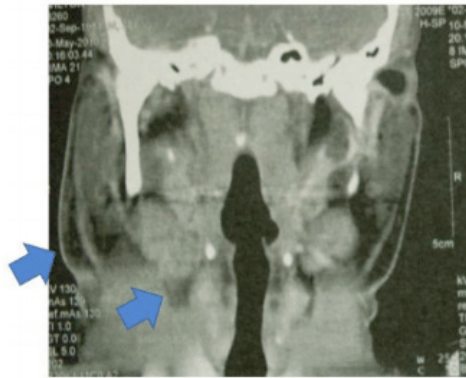


Figure 5 - CT showing accumulation of secretion in the submandibular fascial space and evolving to the cervical region

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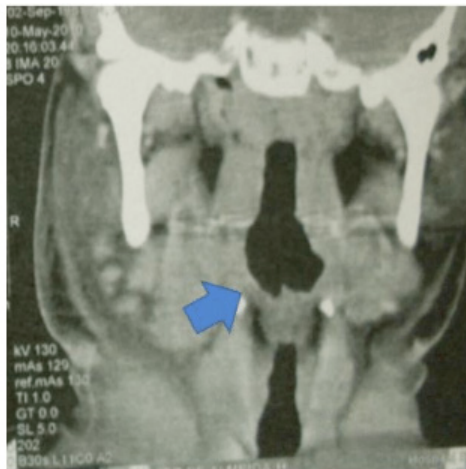


Figure 6 - Trachea deviation

Source: Personal Archive

protocol adopted was surgical drainage of the spaces involved, in a surgical center, followed by the installation of penrose drains, maintained for 48 hours (figures 7 to 11).

The patient evolved with significant clinical improvement and resolution of the above-mentioned condition. He was discharged from the hospital with improvement in the leukogram (initial 18,000 mm³ and at hospital discharge 9800 mm³), he was instructed on post-discharge care, medicated with cephalexin, nimesulide and dipyron and instructed on the removal of the causal focus.

DISCUSSION

Ludwig's angina is an advanced stage of facial cellulitis, which affects the submandibular and sublingual fascial spaces bilaterally, and submental spaces, involving the mouth and cervical regions.³ It is considered an emergency in dentistry due to the high risk to the patient's life, as it has a high chance of evolving with complications, such as: airway obstruction due to elevation of the mouth floor and tracheal deviation, mediastinitis, thoracic empyema, pericarditis and even shock. septic⁴.

Its most common etiology is through the oral cavity in cases of odontogenic infections, in addition to tonsillar abscess and foreign bodies. ⁴, being those of odontogenic origin more related to the lower third molar, related to dental caries lesions and pulp necrosis ^{1,4}. Host predisposing factors such as diabetes mellitus, alcoholism, obesity and malnutrition may contribute to the poor prognosis of the case. ².

In the oral cavity we find more than 500 different types of bacteria, 22 of which are found in greater quantity and have been identified and cataloged. In addition to several species of fungi and viruses, we also found some genera of protozoa present there. Each surface of the oral cavity has different

microbiota⁵. The most common groups found are both anaerobic and aerobic bacteria, being classified as a mixed microbiota, promoting the release of a series of endotoxins and proteolytic enzymes capable of degrading the tissue and causing the formation of purulent secretion.^{1,2,5}

To determine which microbiota is present in the infection, we can use laboratory microbiological diagnostic tests, through aspiration of the content, this method is highly effective because it reduces the chances of contamination and alteration of the existing microflora, for this, asepsis of the skin, with chlorhexidine, for example, before puncture and aspiration performed with the aid of a syringe attached to the needle. The samples must be transferred to a sterile tube, containing sodium polyethanol sulfonate (anticoagulant)⁵. Through this sample, an antimicrobial susceptibility test can be requested by means of culture, thus allowing to determine the level of sensitivity and resistance of each specific microorganism present in the sample against a range of antibiotics, thus, it is possible to determine which most appropriate antibiotic therapy protocol for each patient, achieving success in the propaedeutic choice⁶.

Patients with dyspnea and high risk of airway obstruction must undergo orotracheal intubation, preferably performed by means of fibroscopy, to maintain the airway, which is a priority for the responsible team.⁷

Removal of the cause of the infection is the main form of treatment, with the pharmacological and surgical part being supporting ⁸. The pharmacological treatment to be recommended is empirical antibiotic therapy at first, consisting of a broad-spectrum antibiotic, since the bacterial flora involved in Ludwig's Angina is mixed, with amoxicillin associated with potassium clavulanate being most commonly used,



Figure 7 - Drained secretion from the right submandibular space

Source: Personal Archive



Figure 8- Drained secretion from the submental space

Source: Personal Archive

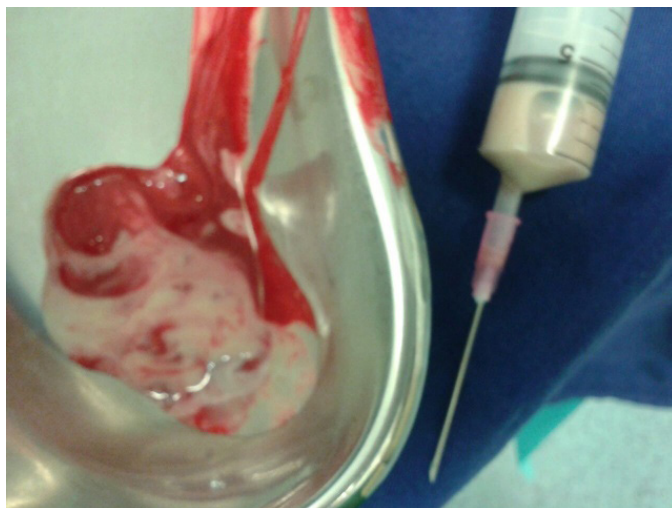


Figure 9 - Drained secretion from the left submandibular region

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Figure 10 - Communication of fascial spaces

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Figure 11 - Installation of penrose drains

Source: Personal Archive

followed by of ceftriaxone plus metronidazole and clindamycin plus levofloxacin.^{7, 8, 9, 10} As performed in this clinical case, the drug therapy instituted was the use of ceftriaxone.

The use of intravenous steroids, such as dexamethasone, remains controversial in the literature, however, it has already shown good results as adjunctive therapy in patients with dyspnea, tracheal deviation and airway obstruction, in terms of reducing the need for aggressive interventions to maintain the airways, allowing intubation to be facilitated, avoiding the need for tracheostomy and cricothyroidotomy. In addition to allowing antibiotic penetration to be optimized^{7,9,10,11}. Using these results from the literature, it was decided to use pulse therapy with corticosteroids at the time of the patient's admission. However, the use of steroids in diabetic patients must be avoided due to the hyperglycemic effect of the drug.⁹

Surgical intervention comprises drainage and decompression of the affected phascial spaces, in order to eliminate all purulent collection and microorganisms, in addition to debridement of necrotic tissue and installation of drains, which is a consensus in the literature.^{7, 9, 10}

Taking into account the data reported above, the clinical case reported previously followed the patterns found in the literature regarding clinical, surgical and pharmacological management, confirming the success of the existing protocol.

CONCLUSION

The diagnosis and treatment of patients with maxillofacial infections must be done carefully and early, because it is a pathology of rapid evolution that can lead the patient to death, being considered an emergency in dentistry, it must take into account three main pillars as a conduct to minimize risks to life and achieve a good clinical prognosis for the

patient: effective maintenance of the airways through intubation, drug therapy with broad-spectrum antibiotics in adequate doses and surgical drainage of the fascial spaces involved.

REFERENCES

1. Bertossi D, Barone A, Iurlaro A, Marconcini S, De Santis D, Finotti M, Procacci P. Odontogenic orofacial infections. *Journal of craniofacial surgery*. 2017 Jan 1;28(1):197-202.
2. Vallée M, Gaborit B, Meyer J, Malard O, Boutoille D, Raffi F, Espitalier F, Asseray N. Ludwig's angina: A diagnostic and surgical priority. *International Journal of Infectious Diseases*. 2020 Apr 1;93:160-2.
3. Parker E, Mortimore G. Ludwig's angina: a multidisciplinary concern. *British Journal of Nursing*. 2019 May 9;28(9):547-51.
4. Alotaibi N, Cloutier L, Khaldoun E, Bois E, Chirat M, Salvan D. Criteria for admission of odontogenic infections at high risk of deep neck space infection. *European Annals of Otorhinolaryngology, Head and Neck Diseases*. 2015 Nov 1;132(5):261-4.
5. Topazian RG, Goldberg MH, Hupp JR. *Oral and maxillofacial infections*. Philadelphia: W.B. Saunders; 2002.
6. Bayot ML, Bragg BN. Antimicrobial susceptibility testing. InStatPearls [Internet] 2021 Oct 17. StatPearls Publishing.
7. Pak S, Cha D, Meyer C, Dee C, Fershko A. Ludwig's angina. *Cureus*. 2017 Aug 21;9(8).
8. Ogle OE. Odontogenic infections. *Dental Clinics*. 2017 Apr 1;61(2):235-52.
9. Vieira F, Allen SM, Stocks RM, Thompson JW. Deep neck infection. *Otolaryngologic Clinics of North America*. 2008 Jun 1;41(3):459-83.
10. Bridwell R, Gottlieb M, Koyfman A, Long B. Diagnosis and management of Ludwig's angina: An evidence-based review. *The American Journal of Emergency Medicine*. 2021 Mar 1;41:1-5.
11. Tami A, Othman S, Sudhakar A, McKinnon BJ. Ludwig's angina and steroid use: a narrative review. *American Journal of Otolaryngology*. 2020 May 1;41(3):102411.