

ANGINA OF LUDWIG ARISING OUT OF ENDODONTIC INFECTION: A CASE REPORT

KARINA ARAÚJO¹, ISABELA GREGANINI¹, ALBERTO FABIO LIMA², ANGELA MELO PRÊMOLI², VANESSA RODRIGUES DO NASCIMENTO³, LUIZ FERNANDO TOMAZINHO^{4*}

1. Student's undergraduate degree in Dentistry at the University Paranaense – UNIPAR; 2. Dental Surgeon, Endodontic Specialist; 3. Specialist in Endodontics Master in Radiology, Dentistry Course Professor at the University Paranaense – UNIPAR; 4. Specialist in Endodontics, USP-SP PhD, Professor of Dentistry Course at the University Paranaense - UNIPAR.

* Inaja Street, no 3560, Ap 42 Centro, Umuarama, Paraná, Brazil. ZIP CODE: 87501-160. tomazinho@unipar.br

Received: 07/29/2016. Accepted: 10/10/2016

ABSTRACT

The Ludwig's angina is a cellulite described by Wilhelm Frederick von Ludwig 1836 which is often originates from an odontogenic infection (representing about 70% of cases) classically located in the second and third molars, which involves the space submandibular, sublingual and submental. The apexes of these teeth are precisely located below the insertion of the mylohyoid muscle, thus being in close anatomical relation to the submandibular space. In any tooth infection, the subsequent drilling of the cortical jaw in contact with the language will lead to progression of the process in the submandibular, sublingual and submental spaces. Ludwig angina that are of dental origin, tend to be more serious and severe than those of other causes, may have higher systemic complications. The association of dental caries can make more aggressive, with a rapid spread. This situation requires surgery and early tracheostomy added to clinical treatment protocols. The protocol of care must be rigorous, always aiming at the drainage of the purulent collection, the removal of the causal agent, the maintenance of the antimicrobial agents and the stabilization of the patient. The professional team's expertise in diagnosing the condition, combined with skill and rapid care, were critical to successful treatment.

KEYWORDS: Ludwig's angina, endodontic infection, systemic complications

1. INTRODUCTION

Most odontogenic infections originate from pulpal necrosis with bacterial invasion in the periapical and periodontal tissue, the accumulation of inflammatory cells at the apex of a necrotic tooth can lead to abscess formation, when the infection prevails over the host's resistance. These abscesses may be symptomatic or asymptomatic since the acute and chronic classification becomes inadequate because both types represent acute inflammatory reactions. The periapical abscess becomes symptomatic when the purulent material accumulates in the alveolus¹.

When this purulent secretion spreads through the bone marrow spaces or cortical surfaces of the bone re-

sults in a process called osteomyelitis, and when it diffuses through the soft tissues, cellulite forms. Once localized in the soft tissues this abscess can be channeled through the suprajacent soft tissue where the cortical can be perforated in a place that allows its penetration into the oral cavity or through the suprajacent skin and drain by a cutaneous fistula. If the abscess is not able to drain through the oral cavity or the skin surface, it extends through the soft tissue facial planes in a diffuse form forming what we call cellulite and the most common types are Ludwig's Angina and thrombosis of the Cavernous sinus. Cavernous sinus thrombosis presents as a periorbital edema-like enlargement with involvement of the eyelids and conjunctiva, with protuberance and fixation of the eyeball, progression may involve the central nervous system.

Ludwig's angina

Ludwig's angina is a cellulitis described by Wilhelm Frederick von Ludwig in 1836, which is frequently originated from an odontogenic infection (corresponding to almost 70% of the cases) classically located in the second and third lower molars, which involves submandibular, sublingual and submental space. The apexes of these teeth are located just below the milo-hyoid muscle insertion, being consequently in an intimate anatomical relation with the submandibular space. In the eventual dental infection, the subsequent perforation of the cortical of the mandible in contact with the tongue will lead to the progression of the process in the submandibular, sublingual and submental spaces².

Although in the vast majority of cases the focus is of odontogenic origin, infection of palatine tonsils, sialoadenites, epiglottitis, and infected thyroglossal cyst are infectious foci reported as the etiology of Ludwig's angina, as well as: infection of a jaw fracture, perforating wound of mouth floor³.

The presence of dental caries, oral trauma, immunodepression and the continuous use of psychoactive sub-

stances such as alcohol and drug abuse are predisposing factors for this infection. Typical symptomatology includes pain, cervical enlargement, dysphagia, odynophagia, trismus, buccal edema, lingual protrusion, fever, lymphadenopathy and chills⁴.

For the diagnosis of Ludwig's Angina, the following characteristics should be observed: it begins at the floor of the mouth, usually with infection of the 2nd or 3rd lower molar; dissemination occurs to the submandibular space, more contiguity, by the planes of the fascia. Then by the lymphatic vessels; The infection presents as hardening of the submandibular region, without formation of much purulent secretion; The process saves the salivary glands and lymph nodes; Is usually bilateral⁵.

Ludwig's Angina treatment is based mainly on the triad, maintenance of the patent superior airways, appropriate intravenous antibiotic therapy and surgical drainage, considering parenteral hydration and removal of the infectious focus. The maintenance of patent airways is an important step in the success of treatment, since infection can lead to respiratory obstruction quickly. In such cases, a tracheostomy or cricothyroidostomy should be indicated in the maintenance of airways⁶, although it should be remembered that this procedure may result in a greater spread of infection, making the procedure dangerous, under these conditions⁷.

2. CASE REPORT

A Patient ASV, male, 32 years old, drug user, alcohol, cigarette presented to the Health Station of Nova Ubiratã-MT with high fever, general malaise generalized pain and inflammatory process in the anterior cervical region, edema, flushing, Pain, trismus. The radiographic examination shows destruction of the third right lower third molar caused by carious lesion as shown in Figure 1.



Figure 1. Initial panoramic radiography.

The clinical examination performed by the dentist at the health clinic showed an increase in the volume of the sub-colon and submandibular bilateral regions of hardened consistency (Figures 2A and 2B). According to Shafer (1985)¹, the patient can be diagnosed with Angina of Ludwig, where he presents a classic picture of signs

and symptoms as a firm, diffuse and painful swelling in the floor of the mouth, with no evidence of fluctuation and no absence of depression of the tissues when pressed.



Figure 2. Preoperative images.

Physically, the patient presented febrile, septic, reporting gastric intoxication due to abuse of analgesics, hyperemia in the cervical region associated with hyperthermia and limitation of mouth opening. The patient's oral hygiene picture was deficient, justifying the gingivitis presented.

The patient was referred to Hospital Regional de Sorriso - MT, where he was hospitalized and treated with antibiotics (clindamycin and ceftriazone). On the following day, under general anesthesia and orotracheal

intubation, surgical drainage and extraction of element 48 were performed, which would be the causal factor for all infections. After the second day of hospitalization, there was a notable improvement in his clinical condition, which continued to evolve to cure throughout hospital care. On the tenth day of hospitalization, the patient was discharged and was referred to the health clinic of Nova Ubiratã to continue performing the periodic exchanges of topical dressings according to Figures 3A and 3B.



Figure 3. Local asepsis and dressings.

The patient was under clinical control until its complete recovery And healing of the surgery, which took 21 days. (Figures 4A and 4B).

3. DISCUSSION

Preventing the respiratory airways from being clogged is a major goal in any treatment. Dyspnea, tachypnea, tachycardia, wheezing, restlessness, and the patient's need to maintain an upright posture suggest

obstruction of these respiratory airways. Parallel to these signs, symptoms such as fever, leukocytosis and a high erythrocyte rate can also be observed. These symptoms are classically observed in purulent collections⁸.

The antibiotic therapy regimen may be established based on high doses of penicillin G and may be combined with other agents, such as metronidazole, clindamycin or cefoxitin, until the establishment of the definitive scheme based on culture and antibiogram⁹. According to this team of researchers, preoperative and postoperative antibiotic therapy is part of the treatment for Ludwig's Angina, and a previous attack dose should be performed.



Figure 4. AA - Exchange of local dressing; B- Complete wound healing.

In a survey conducted between 2009 and 2013, Marcato (1997)¹⁰ analyzed medical records of UEL's Regional University Hospital (HURNP), which concluded that of the 108 patients with odontomic infection, 9 evolved to Ludwig's Angina, and that all patients needed treatment in a hospital surgical center (orotracheal intubation, tracheostomy and cricothyroidotomy) for

maintenance of the airways and, thus, mortality prevention, and all patients treated at HURNP received as antibiotic-initial therapy the hospital protocol of Clindamycin 600 mg IV, every 6 hours in combination with Ceftriaxone 1g IV every 12 hours.

Our clinical management of the case was based on previous procedures reported by Kurien *et al.* (1997)¹¹, where Ludwig's Angina's that are of dental origin are usually more severe and severe than those of other causes and may present greater systemic complications. The association of dental caries can make it more aggressive, with rapid dissemination. This situation requires surgical intervention and early tracheostomy in addition to clinical treatment protocols.

Ludwig's Angina usually has a polymicrobial character, composed of aerobic, facultative and anaerobic, which are part of the resident microbiota and colonize the oropharynx, being species such as *Streptococcus*, *Staphylococcus* and *Bacteroides* commonly found¹².

The clinical case is of dental origin, related to the third right lower third molar. The origin and course of the infection were periapical or periodontal, because of the position of the apex of the root in relation to the milo-hyoid crest in agreement with Shafer (1985)¹. Also the thinner thickness of the alveolar process on the lingual aspect of the mandible caused the infection to erupt into the submandibular space. Due to the state of oral hygiene presented by the patient, it suggests that the septicity of the buccal medium may have contributed to the onset of infection associated with pulp necrosis¹³.

4. CONCLUSION

Patients with Ludwig's angina, which is a severe, rapidly progressive infection, should be treated with immediacy, as they may lead to serious complications, or even death. The protocol of care should be rigorous, always aiming at drainage of the purulent collection, removal of the causal agent, maintenance of antimicrobial agents and stabilization of the patient. The professional team's expertise in diagnosing the condition, combined with skill and rapid care, were critical to successful treatment.

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