

Dental Abscess And “Unexpected Death”...

Case Report

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Abstract

Even though we are living in an era of major technical-scientific advances and effective antimicrobial and antiviral therapy, dental infections are still the most important predisposing factors for head and neck infections. Odontogenic infections can cause severe complications, e.g. compromised airways, tissue necrosis, deep neck infections, mediastinitis, endocarditis and sepsis. These severe odontogenic infections can be potentially life-threatening. Usually odontogenic infections respond well to a combination of surgical treatment (incision, drainage) and antibiotic therapy. However, especially when the medico-surgical therapy is installed late, cases may evolve unfavourably and be fatal. The authors report a case of a 30-year-old man who was observed on three consecutive occasions by the General Practitioner in a District Hospital, for a decayed tooth with abscess and was, then, referred to a Central Hospital. There, he was examined for the fourth time, this one by a Stomatologist at the Emergency Department, where he died. The post mortem examination revealed bacterial (Gram +) acute neutrophilic (purulent) infection of soft tissues of the mandibular region and neck with para-tracheal extension, as well as thrombosis of the left jugular vein. Circumstantial clinical information, post mortem findings, pathophysiology (including complications and progression of the disease to death) are discussed, highlighting the relevance of accurate and timely diagnosis and treatment to avoid malpractice and mortality.

Keywords: Dental Abscess; Odontogenic Infections; Cellulitis; Jugular Vein Thrombosis; Post Mortem.

Introduction

More than 90% of head and neck infections can be traced back to an odontogenic origin [1, 2]. Dental abscesses are the second most common reason for a dental office visit [3]. These infections are often polymicrobial and usually caused by anaerobic bacteria, streptococci and *Staphylococcus* species [4]. There are several predisposing factors, which may exacerbate odontogenic infections, such as long-term diabetes mellitus, obesity, chronic alcohol abuse, liver pathology or immunodeficiency (human immunodeficiency virus, systemic lupus erythematosus, organ transplantation, chemo and radiotherapy). In early stages, symptoms are often underestimated, which may lead to errors in diagnosis and treatment or to delay in the correct therapy. Early diagnosis is crucial for effective therapy in such severe infections [5]. The importance of

an appropriate or aggressive treatment of deep neck infections, irrespective of the origin or cause, has already been emphasized by other authors, namely performing incision and drainage [6, 7].

Case Report

A 30-year-old man with a personal history of cognitive retardation, congenital deafness and communication deficit, was initially evaluated at the Emergency Department (ED) of a District Hospital for left-side odontalgia. A dental abscess was diagnosed. He was medicated with antibiotics and discharged the same day (Day 1). The next day (Day 2), he returned to the same hospital, referring dizziness and pain, showing oedema and inflammatory signs of the left hemiface due to the carious tooth with abscess. He was advised to continue taking the prescribed medication (amoxicillin

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three times a day, with an interval of eight hours and ibuprofen) and to return in case of clinical worsening. On the following day (Day 3), he was again examined at the same ED, as there was no relief of the symptoms. He presented an ulcerated lesion of the tongue with local haemorrhage and he was transferred to Stomatology in a Central Hospital. At admission, he presented fever ($T = 38.9^{\circ}\text{C}$), cellulitis of the face, caries in mandibular right second molar with drainage of pus to the oral cavity. He was given intravenous amoxicillin/clavulanic acid and clindamycin and he was discharged from the hospital with the recommendation to return if the clinical situation worsened. On the following day (Day 4), he was again examined by Stomatology due to dyspnea. During the medical examination, the patient lost consciousness with subsequent cardiac arrest. Advanced life support manoeuvres were performed for about 50 minutes without success, being declared dead.

A post mortem examination was performed at the Department of Forensic Pathology of the National Institute of Legal Medicine and Forensic Sciences (Portugal, Coimbra). At the autopsy, external examination showed: body mass index of 29.6 kg/m^2 (overweight); poor teeth condition; moderate to marked oedema of the left hemiface. Internal examination revealed: a) greenish-yellow purulent material both in the soft tissues contiguous to the mandibular body at the left anterolateral cervical region (Figure 1) and both peri-oesophageal and peri-tracheal (Figure 2), extend-

ing to soft tissues around bronchial bifurcation; b) presence of hematic material adherent to the intima (thrombus) occluding the left internal jugular vein; c) marked oedema of the lungs; d) signs of myocardial hypertrophy and hepatic steatosis; e) marked and diffuse vascular congestion of the organs.

Toxicological analysis (ethanol, illicit drugs and medicines) was negative for researched substances. Anatomic-Pathological (histo and cytopathological) study disclosed bacterial (Gram +) acute neutrophilic oral-cervical-thoracic infection with abscedated areas, complicated by thrombosis of the left internal jugular vein (Figure 3: a, b, c and d), which caused the death.

Discussion and Conclusion

The importance of maxillofacial infections can be attributed to their high incidence and morbidity. Incorrect or delayed diagnosis and treatment generally lead to serious, namely life-threatening complications [1]. An example of the most critical clinical evolution of the odontogenic infections, that usually spread directly, is Ludwig's Angina, a necrotic fasciitis of head and neck, which reaches the mediastinum causing mediastinitis [8-16]. Deep neck infections of odontogenic origin are usually a multiple space process, which may also be favoured by the delay in clinical presentation, allowing the infection to continue spreading along the

Figure 1. Neck incision; the exit of purulent material.

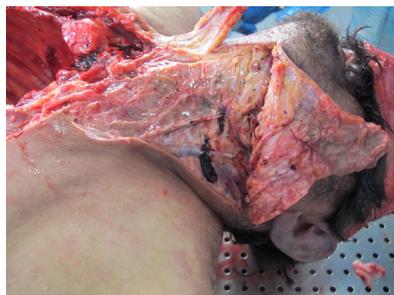


Figure 2. Macroscopic appearance of the abscess after formaldehyde fixation of cervico-thoracic block.



Figure.3a. Cytological smear of the abscess, with abundant neutrophils [HE x400].

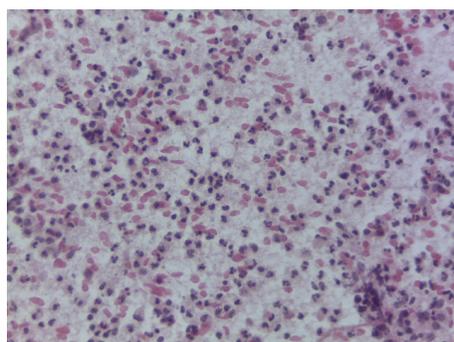


Figure.3b. Histological view of the soft tissues' acute inflammation, with abscess (A) [HE x100].

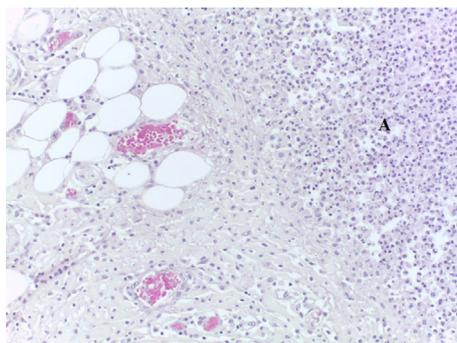
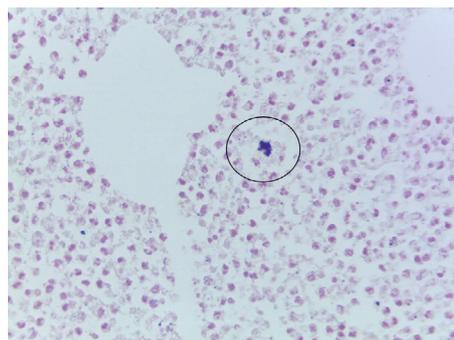


Figure.3c. Histochemical blue/violet staining of the Gram positive microorganisms (inside the circle) [Gram x200].



cervical soft tissue. Whenever untreated, the infection will spread downwards into the mediastinum and thorax, with eventual fatal outcome [17].

Infectious settings may favour the occurrence of coagulopathies, namely thrombosis, due to the invasion of the vascular system by microorganisms/bacteria, where they produce endotoxins, which induce platelet aggregation and cause thrombus formation. When the internal jugular vein is involved, the entity is named Lemierre's syndrome, if Gram-negative are present or Lemierre's-like syndrome, if the bacteria is Gram-positive (as in the present case) [18-22]. The case here reported highlights the importance of accurate clinical diagnostic work-up and therapy, especially taking into consideration that the victim, despite having a history of cognitive retardation, congenital deafness and poor communication, was evaluated four consecutive shortly-spaced times at the Emergency Department. Although he was diagnosed with a dental abscess, no imaging study was performed, namely Computed Tomography, periapical or panoramic radiographs, as indicated in such cases. Moreover, the patient was treated conservatively and empirically with antibiotics, without microbiological cultures and no surgical treatment was performed.

Odontogenic infections with fulminant progression should be treated, based on clinical and imaging data, with immediate surgical incision and drainage of the purulent content, to eliminate the microorganisms, complemented with intensified intra- and post-operative irrigation. If needed, imaging re-evaluation followed by further incisions should be performed. Immediate antibiotic treatment adapted to the antibiogram is of utmost importance (2). To avoid and/or reduce the mortality in these cases, a high degree of diagnostic suspicion complemented by adequate ancillary examination techniques and timely aggressive surgical interventions are mandatory. Although the report of odontogenic infection found in forensic pathology is not abundant in the worldwide

literature, this case emphasizes the importance of forensic medicine investigation in situations of inadequate medical follow-up and subsequent therapeutic intervention.

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