

# Phlegmon in the Buccal, Temporal and Deep Temporal Space from Mandibular Wisdom Tooth: Case Report

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**Abstract:** *Odontogenic infections (OI) are often seen as swelling in the superficial and deep spaces of the maxillofacial region. In the present case, a patient with rare phlegmon in the buccal, temporal and deep temporal space, associated with mandibular wisdom tooth, in the background of drug abuse and malnutrition is reported. Prompt treatment should be initiated in order to avoid severe complications.*

**Keywords:** phlegmon, odontogenic infection, mandibular wisdom

## 1. Introduction

Dentoalveolar infections may range from mild localized dentoalveolar abscess to severe life-threatening deep fascial space contamination. Odontogenic infections (OI) are usually secondary to caries, pulpitis, periodontal disease, postoperative infection or inflammation of the pericoronal tissues [11]. OI are one of the most difficult pathologies to manage in dentistry and in oral surgery in particular, as they can be resolved via local surgical means-though in some cases serious complications may occur and result in important morbidity-mortality.

The spread of the OI is preferentially along the lines of least resistance through the cancellous bone until it encounters the cortical plate. The host resistance is determined by the virulence of germs, as well as the local and systemic defense mechanisms [3]. Systemic alterations are known to be able to favor spreading of infection, including HIV/AIDS, diabetes mellitus, malnutrition, immunosuppressive therapy, chemotherapy, drug abuse, etc. [10].

The location of the inflammation in the anatomical spaces of the temporal, deep temporal, buccofacial area is associated with increased risk of compromised function of the respiratory tract and additional vital structures [14]. A classification of the OI severity has been proposed, indicating the level of respiratory tract and vital structures impairment with four stages suggested-mild, moderate, severe and extremely severe, marked by a numerical score of 1 to 4 0. The appropriate assessment of the infection severity based on its location, microbial aggressiveness, immune host defense and systemic alterations, is of primary importance for the early diagnosis establishment and treatment.

The purpose of this article is to present an unusual case of phlegmon in the region of buccal, temporal and deep temporal space, derived from periapical abscess to the right mandibular wisdom tooth in a drug addicted patient.

## 2. Case Report

A 29-year-old male patient is presented with severe pain in the mandibular right wisdom tooth, together with significant swelling in his right buccal and temporal region. Tracing back the history, the tooth crown has been partially fractured 5-6 months ago, as constant pain and soft tissue swelling in the oral cavity within the last 10 days was reported. The patient visited dentist and Clindamycin was prescribed twice a day. Restriction in the lower jaw movements and elevated temperature persist from 3-4 days. Following limited response to the initial therapy, the patient was referred to Oral and Maxillofacial surgery clinic. History of heroine drug abuse from 16 years was noted. No history of HIV neither hepatitis was reported. The patient suffers from chronic malnutrition and loss of appetite.

During the physical examination, the patient was found to be conscious, with fever (38.3°C), dysphagia, dehydration and severe trismus. Marked fascial asymmetry was demonstrated in the right buccal and temporal spaces, with significant redness, hyperemia and no clear boundaries. The swelling is solid and painful on palpation. Cellulitis of the right orbicular area was also noted. Regional lymphadenopathy was found. The mouth-opening distance was 5mm between the central incisors. Intraorally, extensive decay and fractured crown of mandibular right wisdom tooth was noted, with inflammation of the surrounding soft tissue (Figure 1). The radiographic examination revealed radiolucency around the apex of the tooth without clear borders (Figure 2). Paraclinical test demonstrate increased number of white blood cells (18,7x10<sup>9</sup>/L) and elevated C-reactive protein level (58 mg/L).



**Figure 1:** Swelling in the right buccal region and trismus were observed



**Figure 2:** Radiolucency in the apical region of mandibular right wisdom tooth.

Due to the severity of the symptoms, the patient was admitted in hospital. Intravenous antibiotic therapy was given (ceftriaxone 2g every 24h and metronidazole) followed by surgical treatment. An intraoral incision in the buccal region was performed and drainage was fixed in the incision line via suture until the suppuration was ceased. The mandibular right third molar was extracted. The patient was signed out of the hospital on the 5<sup>th</sup> day with amoxicillin/clavulanic acid taken orally for 7 days. At the end of the treatment, temporal and buccal edema, trismus, fever and pain were completely resolved.

### 3. Discussion

OI are probably the most common infections in the maxillofacial region and are associated with wide range of serious complications. There are several spaces on the head and neck formed by muscles and fascias, which can be occupied by OI, as odontogenic temporal space abscess, subperiosteal abscess of the orbit [8], cavernous sinus thrombosis [9], mediastinitis [6], etc. have been reported. Most of these abscesses are life-threatening or may be followed by irreversible tissue damage.

In most cases OI that arises from mandibular third molar is spread in the spaces surrounding the mandible (especially

submandibular, pterygomandibular, parapharyngeal space), however phlegmon in unusual regions should be expected. To our knowledge, phlegmon in the buccal, temporal and deep temporal space developed from mandibular wisdom tooth with periapical abscess has not been reported. Temporal and deep temporal space abscess usually arises from maxillary molars and buccal abscess often has non-odontogenic origin (trauma, dermatogenic, etc.).

The buccal space is situated between the zygomatic arch above, inferior border of the mandible below, anterior border of masseter posteriorly, zygomatic major and depressor anguli oris muscles anteriorly, as the most important contents are the parotid duct, fascial artery and vein, transverse fascial artery and vein, buccal fat pad, accessory parotid gland and lymph nodes [13]. The origin of the infection in this space could be dermatogenic, odontogenic, stomatogenic or trauma associated. The buccal space communicates with the following neighboring spaces: temporal, infratemporal, infraorbital, pterygomandibular and submasseteric spaces, into which the infection may spread. In a study conducted by Kunkel et al. [7], 55 patients have been admitted for hospital treatment owing to severe mandibular third molar complications within a period of 2 years. Only 4 cases of buccal abscess were reported without any data for inflammation in the temporal or deep temporal space.

The temporal space is situated between squama temporalis and the temporal fascia, as it is replete by the temporal muscle. It is divided into superficial (between the fascia and the temporal muscle) and deep (between the muscle and temporal squama) temporal space. The temporal fascia is attached superiorly to the temporal line (linea temporalis) as a single layer, while the inferior attachment is duplicated and is embedded to the zygomatic arch [4][13]. Odontogenic and non-odontogenic infections from the deep temporal, buccal, orbital space, etc. may invade the temporal space. Inflammation is expected to lead to severe trismus.

The deep temporal space (infratemporal space) is located between the maxillary tuberosity (anteriorly), styloid process (posteriorly), external lamina of the pterygoid process of sphenoid bone (medially) and the mandibular ramus (laterally). It is filled with the lateral pterygoid muscle. Maxillary nerve and artery are running through the deep temporal space and pterygoic venous plexus is lying there [13]. Infratemporal space communicates with the orbit through pterygopalatine fossa; with the temporal region; with the pterygomandibular space and mouth floor through the lingual nerve; with the cranial fossa and cavernous sinus through foramen rotundum; with the buccal space through the buccal fat pad [13]. All these anatomic paths are reason for rapid spreading of the infection.

In the present case significant fascial asymmetry was observed in the buccal and temporal region. However, deep temporal space infection could be easily misdiagnosed and underestimated by dentists. Limited mouth opening is sure sign of myofasciitis and inflammation in spaces adjacent of masticatory muscles in those cases should always be considered. Ascendance of the infection from mandibular wisdom through the buccal space into the temporal and deep

temporal is rare and not commonly observed by the clinicians. It is possible to be related to impaired immunity. Probably the most dangerous complication that can develop is necrotizing fasciitis of the tissues which is a serious life-threatening condition [12]. Odontogenic phlegmon in the temporal region have been reported in the literature to be evolved from dentigerous cyst around impacted tooth in the coronoid mandibular process [4].

The most appropriate treatment plan consists of surgical and antibiotic therapy. The current recommendations in the literature are to extract the infected teeth as soon as safely possible and thus to prevent facial space infection, with greater morbidity and possible mortality [5]. Incision and adequate drainage of the purulent exudate should always be performed. An antibiotic therapy is prescribed. In addition, the patient described in the present case has a history of drug abuse and malnutrition and increased risk of poor healthcare outcomes. However, at the end of the treatment all the complaints and symptoms were completely resolved.

#### 4. Conclusion

Nowadays severe OI-abscesses and phlegmons in maxillofacial region are fairly successfully managed with increased attention to patients affected by risk factors inhibiting their immunocompetence. The risk of rapid spread of infection and serious complications, announce the urgency in the appropriate diagnosis establishment and medical care. We recommend thorough surgical treatment in combination with sufficient antibiotic therapy.

#### References

- [1] Diacono MS, Wass AR. Infratemporal abscess and temporal fossa abscess complicating dental extraction. *J Accid Emerg Med* 1998; 15:59–61.
- [2] Flynn TR, Shanti RM, Levi MH, Adamo AK, Kraut RA, Trieger N: Severe odontogenic infections, part 1: prospective report: *Journal of oral and maxillofacial surgery* : *J Oral Maxillofac Surg* 2006; 64:1093-103.
- [3] Flynn TR, Wiltz M, Adamo AK, Levy M, McKitnick J, Freeman K. Predicting length of hospital stay and pencyllin failure in severe odontogenic infections. *Int J oral Maxillofac Surg* 1999; 28:48.
- [4] Ivanova M, Stanimirov P. Phlegmon in the temporal region evolved from exacerbated follicular cyst in processus coronoideus mandibulae. 1999-2000, V, XXVII. 15-18 [on Bulgarian]
- [5] Johri A, Piecuch J F. Should teeth be extracted immediately in the presence of acute infection? *Oral Maxillofac Surg Clin North Am* 2011; 23:507-11.
- [6] Kinzer S, Pfeiffer J, Becker S. Severe deep neck space infections and mediastinitis of odontogenic origin: clinical relevance and implications for diagnosis and treatment. *Acta Oto-Laryngologica* 2009; 129:62-70.
- [7] Kunkel M, Morbach T, Kleis W, Wagner W. Third molar complications requiring hospitalization. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 2006; 102:300-306.
- [8] Muñoz-Guerra MF, González-garcía R, Capote AL, Escorial V, Gías LN. Subperiosteal abscess of the orbit: an unusual complication of the third molar surgery. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006; 102:9–13.

- [9] MW HCF, Lui CC. Cavernous sinus thrombosis following odontogenic and cervicofacial infection. *Eur Arch Otorhinolaryngol* 1991; 248:422-4.
- [10] Poveda Roda R, Bagan JV, Sanchis Bielsa JM, Carbonell Pastor E. Antibiotic use in dental practice. A review. *Med Oral Patol Oral Cir Bucal* 2007; 12:186-92.
- [11] Sanchez R, Mirada E, Arias J, Pano JR, Burgueno M: Severe odontogenic infections: epidemiological, microbiological and therapeutic factors: *Med Oral Patol Oral Cir Bucal* 2011; 16:670-6.
- [12] Stanimirov P. Necrotizing fasciitis of the eyelids and the face. *Reference Ophthalmology Bulletin* 2013; 1:30-37 [on Bulgarian]
- [13] Ugrinov R. Maxillofacial and oral surgery. 2006; 177-266. [on Bulgarian]
- [14] Zamiri BA, Hashemi SB, Hashemi SH, Rafiee ZC, Ehsani S. Prevalence of Odontogenic Deep Head and Neck Spaces Infection and its Correlation with Length of Hospital Stay. *J Dent* 2012; 13:29-3.