

## STREPTOCOCCUS PLURANIMALIUM AS A NEW CAUSATIVE AGENT OF ACUTE PERICORONITIS: A RARE CASE REPORT.

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### ABSTRACT

Difficult tooth eruption or pericoronitis is a very common disorder, which seems to be the most frequent reason of extraction of third molars. It is accompanied by an inflammation of the soft tissues. According to the literature, the microflora of pericoronal pouch mainly consists of hemolytic *Streptococcus* and anaerobic species of *Prevotella* and *Veillonella* genera. However, changes in population immunity and development of diagnostic methods led to some changes of microbiota composition. Moreover, there are no case reports which show presence of *Streptococcus pluranimalium* in the human oral cavity and its ability to cause a pathology of the maxillo-facial region. This report describes the first case of identification *S. pluranimalium* as a pathogen among microorganisms of the oral cavity and proves its main role in development of acute purulent pericoronitis.

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## 1. Introduction

The first and most common clinical manifestation of a difficult tooth eruption is pericoronitis, which is an inflammation of the soft tissues surrounding a tooth. Food debris and plaque get stuck into the pericoronal pouch (between an operculum and a tooth) in case of a compromised mucosal integrity covering the tooth in a retromolar region. There are favorable conditions for growth of obligate and facultative anaerobes in this space [1, 2]. However, due to the rise of new methods for identification of causative agents, the range of etiologically significant microorganisms in the pathology of the maxillo-facial region is significantly wider than the traditional approach, leading to an incorrect diagnosis and an ineffective long-term treatment [3, 4].

## 2. Case report

A twenty-two-year-old female patient was referred to a dental surgery clinic with complaints of severe pain in the left retromolar region with radiation to the ear, limitation of the mouth opening and pain upon swallowing for 3 days.

The patient noticed signs of general intoxication: elevation in body temperature up to 37–37.5°C, decreased appetite, and sleep disturbance. In addition, the patient had a history of a bilateral rhinosinusitis. Upon physical examination, the left submandibular lymph nodes were enlarged and tender to palpation but there were no changes in the shape of the face and skin.

Intraoral examination after preliminary anesthesia (Bercher-Dubov's technique) showed that there was a partially erupted 3.8 tooth, with the operculum covered by swollen and hyperemic tissue. Serosanguineous exudate appeared from under the operculum upon palpation. Swelling and hyperemia spread on the mucosa of the posterior part of the lower arch of the oral cavity vestibule, the lingual side of the gingiva and on the palatoglossal arch. Mobility of the causative tooth was not determined.

We used the following examination methods for diagnosis and treatment plan: panoramic radiography and cone beam computed tomography (CBCT), complete blood count, a bacteriological method for the identification of the causative agent and determination of its sensitivity to drugs using automated bacterial identification system VITEC – 2 system (bioMérieux, France).

The radiographic examination showed space in the dental arch for the tooth eruption and its proper orientation.

The main changes in the peripheral blood were increased erythrocyte sedimentation rate (ESR), insignificant leukocytosis and lymphocytosis (Figure 1).



**Figure 1. Cone beam computed tomography (CBCT) images, which prove the diagnosis of acute purulent pericoronitis in the region of 3.8.**

Based on the bacteriological analysis of the material from the pericoronal pouch, which was taken using a 1 cm sterile dental paper pin (№30), Gram-positive facultative anaerobes, mainly *Streptococcus spp.*, *Staphylococcus spp.*, were found. The pathogens of the *Streptococcus* genus were isolated at  $1,72 \times 10^8$  colony forming units per milliliter (CFU/ml); the predominant species was *Streptococcus pluranimalium*. Counting colonies was traditionally performed manually using a pen and a click-counter. *S. pluranimalium* showed resistance to ofloxacin, ciprofloxacin, vancomycin, however, it was susceptible to cefazolin and cefotaxime. The most relevant laboratory studies are presented in Table 1.

PARAMETER	VALUE	
	On admission	Reference
Erythrocytes (RBCs)	$4,6 \times 10^{12}/L$	$4.2-5.4 \times 10^{12}/L$
Hematocrit	0,38	0.37-0.47
Hemoglobin (Hb)	130 g/L	120-160 g/L
Leukocytes – Total	$18.0 \times 10^9 /L$	$3.5-12.0 \times 10^9 /L$
Neutrophils	$6200 \times 10^6 /L$	$3000-5800 \times 10^6 /L$
Lymphocytes	$3100 \times 10^6 /L$	$1500-3000 \times 10^6 /L$
Monocytes	$420 \times 10^6 /L$	$300-500 \times 10^6 /L$
Eosinophils	$180 \times 10^6 /L$	$50-250 \times 10^6 /L$
Basophils	$15 \times 10^6 /L$	$15-50 \times 10^6 /L$
Platelets	$290 \times 10^9 /L$	$150-400 \times 10^9 /L$
Prothrombin time (PT)	11 sec.	9-12 sec.
Sedimentation rate (ESR)	18 mm/h	0-15 mm/h
Bacteriological examination of material from the pericoronal pouch	<i>Streptococcus pluranimalium</i> <i>Streptococcus sanguinis</i> <i>Streptococcus mitis</i> <i>Staphylococcus warneri</i>	

**Table 1. Laboratory analysis.**

The examination confirmed the diagnosis of acute purulent pericoronitis in the region of 3.8.

The treatment included primary surgical treatment of the purulent focus (operculectomy) in combination with anti-inflammatory therapy (antibacterial drugs, nonsteroidal anti-inflammatory drugs, antihistamines).

The operation was performed under analgesia. The mucosa was incised with a curved scalpel. The wound was drained with a rubber drain.

Anti-inflammatory therapy included: 1) Antibacterial drugs considering susceptibility of the *bacteria* - cefotaxime 0.5G intramuscularly twice per day; 2) Nonsteroidal anti-inflammatory drugs: - ketorolac 10mg intramuscularly three times per day; 3) Antihistamines: - loratadine 10mg once per day. Antiseptic solution (0.05% chlorhexidine) baths were prescribed topically. Dressings were applied daily while an evaluation of the inflammation dynamics was conducted; antiseptic treatment of the wound and replacement of the drain was carried out. The early postoperative period was favorable; the patient noticed a moderate swelling of soft tissues and insignificant pain intensity. The clinical signs of the inflammation disappeared in 7 days.

### 3. Discussion and conclusions

Extraction of third molars is the most frequent surgical operation in dentistry especially in young patients [5]. According to the literature, the microflora of pericoronal pouch mainly consists of hemolytic *Streptococcus* and anaerobic species of *Prevotella* and *Veillonella* genera. In this clinical case, the dominant causative agent of pericoronitis was an  $\alpha$ -hemolytic *S. pluranimalium*, which represents one of the newest human pathogens [4, 6]. Over the years, since the strain was first described, it was identified as pathogen of mastitis in dairy cows, bovine reproductive diseases and valvular endocarditis in broiler chickens. New evidence, collected over the past 5 years, suggests its etiological importance in the development of severe pathological processes in humans such as subdural empyema, septic arthritis [6]. However, there was no reliable data showing the emergence and role of *S. pluranimalium* in the development of inflammatory diseases of the oral cavity. Our patient denied any contact with cattle before hospitalization. Therefore, a pathway for the patient to be contaminated is unclear, moreover, whether this means *S. pluranimalium* has the potential for zoonosis is also uncertain and requires further investigation. We would like to emphasize the importance of bacterial confirmation of causative microorganism using modern bacteriological analyzers or genetic methods because they provide more accurate results and can identify several known pathogens. Moreover, the possibility of rare pathogens causing infectious disorders dictates the need for revision of diagnosis, treatment and prophylaxis of well-known diseases.

This case report describes the rare pathogen *S. pluranimalium* as a causative agent of acute purulent pericoronitis. It confirms the need of using modern methods for diagnosis of infectious diseases in oral cavity.

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**References**

1. Irani S. Orofacial Bacterial Infectious Diseases: An Update. *Journal of International Society of Preventive & Community Dentistry*. 2017;7 (Suppl 2):S61-S67.
2. Petrushanko TA, Tchereda VV, Loban GA. The screening diagnostic of micro ecological disorders of oral cavity. *Klin Lab Diagn*. 2014 Jun;(6):48-50. [Article in Russian]
3. Ananieva M., Nazarchuk O., Faustova M., Basarab Ya., Loban' G. Pathogenicity Factors of *Kocuria kristinae* Contributing to the Development of Peri-Implant Mucositis. *Mal J Med Health Sci* 14(3): 34-38 , Oct 2018.
4. Faustova MO, Ananieva MM, Basarab YO, Dobrobolska OV, Vovk IM, Loban' GA. Bacterial factors of cariogenicity (literature review). *Wiad Lek*. 2018;71(2 pt 2):378-382.
5. Alves-Pereira D, Pereira-Silva D, Figueiredo R, Gay-Escoda C, Valmaseda-Castellón E. Clinician-related factors behind the decision to extract an asymptomatic lower third molar. A cross-sectional study based on Spanish and Portuguese dentists. *Medicina Oral, Patología Oral y Cirugía Bucal*. 2017;22(5):e609-e615.
6. Aryasinghe L, Sabbar S, Kazim Y, Awan LM, Khan HKN. *Streptococcus pluranimalium*: A novel human pathogen? *International Journal of Surgery Case Reports*. 2014;5(12):1242-1246.