

Submandibular odontogenic cellulitis

Vladimer Nikogosyan

Oral & Maxillofacial Surgeon
Tbilisi Central Hospital

ABSTRACT

Background: Submandibular Odontogenic Cellulitis represents acute diffuse purulent inflammation of the soft tissues, caused by the spread of infection from mandibular molars, which is one of the most common complications of an odontogenic infection of the maxillo-facial region.

Aim: This case report highlights the surgical treatment and post-operative care in patients with submandibular odontogenic cellulitis.

Methods: This case report of submandibular odontogenic cellulitis was reviewed. This patient underwent incision and drainage of submandibular cellulitis and extraction of two teeth, including the causal one, followed by comprehensive anti-inflammatory treatment. Intraoperative photos and radiographs documented surgical progress and recovery of the patient.

Results: Recovery was reached within 4 days without any complications. The patient was discharged on the 5th day with further references and close clinical follow-up.

Conclusions: Early involvement of dental professionals is key in prevention of odontogenic infections of the maxillofacial soft tissues and reducing the need for extensive surgery, ultimately improving patient outcomes.

Keywords: maxillo-facial region, odontogenic infections, submandibular odontogenic cellulitis, incision and drainage

INTRODUCTION

The accumulation of acute inflammatory cells at the apex of a nonvital tooth is termed a periapical abscess. Acute inflammatory lesions with abscess formation may arise as the initial periapical pathosis or from an acute exacerbation of a chronic periapical inflammatory lesion. Frequently, the source of the infection is obvious. On occasion, however, pulpal death may be trauma related, and the tooth may contain neither a cavity nor a restoration.

In the earliest stage of all forms of periapical inflammatory disease, the periapical periodontal ligament (PDL) fibers may exhibit acute inflammation but no frank abscess formation. This localized alteration, best termed acute apical periodontitis, may or may not proceed to abscess formation. Although this process often occurs in association with a nonvital tooth, acute apical periodontitis may be found in vital teeth secondary to trauma, high occlusal contacts, or wedging by a foreign object. The clinical presentation often closely resembles that of a periapical abscess and must be considered in the differential diagnosis. (James R. Hupp et al. 2019)

If an abscess is not able to establish drainage through the surface of the skin or into the oral cavity, it may spread diffusely through fascial planes of the soft tissue. This acute and edematous spread of an acute inflammatory process is termed cellulitis. Although numerous patterns of cellulitis can be seen from the spread of dental infections, two especially dangerous forms warrant further discussion: (1) Ludwig's angina and (2) cavernous sinus thrombosis. (Brad W. Neville et al. 2016)

Of all infections associated to oral pathology, the most relevant ones are those that are related to dental pathology. Cellulitis is an infection of the cellular adipose tissue located in the aponeurotic spaces. It can be classified on the basis of location, severity and evolution. The aponeurotic compartments that allow odontogenic infections to spread have been categorised as: superficial compartment, floor of the mouth, masticator compartment, parapharyngeal space, parotid space and paratonsillar space. The present work describes the anatomical structures that comprise these spaces. The clinical forms of facial cellulitis are divided into acute and chronic. Potential complications consist of orbital infections, necrotising fascitis, thrombosis of the cavernous sinus, cerebral abscess and mediastinitis. Diagnosis is made on the basis of anamnesis, physical examination and complementary procedures (analytical tests and imaging studies). Treatment includes: treatment of causes (depending on the underlying cause in each case), incision and drainage, antibiotic therapy (chosen empirically) and complementary medical care. Odontogenic infections are primarily treated with surgery and coadjuvant antibiotic therapy.

METHOD

This case report of submandibular odontogenic cellulitis was reviewed. This patient underwent incision and drainage of submandibular cellulitis and extraction of two teeth, including the causal one, followed by comprehensive anti-inflammatory treatment. Intraoperative photos and radiographs documented surgical progress and recovery of the patient.

This operation was performed at Tbilisi Central Hospital, Georgia, in the Department of Oral and Maxillofacial Surgery and Dental Implantology, by the Head of the Department M.D. Vladimer Nikogosyan and his team.

RESULTS

Case

A 28 years old male presented to our hospital with severe pain and swelling in the left submandibular area, accompanied by complaints of painful swallowing, dysphagia, dyspnea and trismus. According to anamnesis, 5 days ago, the patient began to have a toothache of mandibular left molar, but couldn't pinpoint which tooth it was.

On the next afternoon patient already had some swelling in left submandibular area, with mild fever. On the same day, he started taking antibiotics and antipyretics. The intensity of complaints increased dynamically, the condition had not improved, so the patient went to the dentist, who referred him to our hospital. The patient brought his OPG.

Upon clinical examination, there was noticeable swelling of the soft tissues in the left submandibular region, which was tender, painful to palpation. Intraoral examination was difficult due to limited mouth opening (trismus grade 2).

Intraoral inspection revealed secondary caries of tooth #37, and pericoronitis in tooth #38. The percussion of tooth #37 is extremely painful.

From both sides of the alveolar process, lingually and buccally, subperiosteal abscesses were noted in the projection of teeth #36,37,38. Palpation of these sides was painful.

Based on clinical and radiographic findings (Figure 1), a diagnosis of left submandibular odontogenic cellulitis was established.



(Figure 1) OPG

A treatment plan was developed involving incision and drainage of submandibular odontogenic cellulitis and extraction of the causal tooth.

The operation was performed under general anesthesia. After antiseptic treatment of the operating area, (Figure 2a, b)

(Figure 2a)



(Figure 2b)



an incision was made in the left submandibular region, approximately 2 cm below the lower edge of the mandible. (Figure 3a)

The incision was carried through the skin and subcutaneous fat. (Figure 3b)

(Figure 3a)



(Figure 3b)



With the usage of hemostats, soft tissue dissection was performed with blunt and semi-sharp techniques. (Figure 4), Submandibular cellulitis was drained (Figure 5), the pus was submitted for bacteriological examination (Figure 6).

(Figure 4)



Figure 5)



(Figure 6)



Submandibular, pterygomandibular and parapharyngeal spaces were dissected. The wound was irrigated with antiseptic solutions and drainages were placed and secured (Figure 7, 8)

(Figure 7)



(Figure 8)



Through the intraoral approach, a buccally located subperiosteal abscess was drained (Figure 9), the causal #37 and partially impacted #38 teeth were extracted (Figure 10), the alveolar sockets were curetted, and some simple sutures were placed on the wound.

(Figure 9)



(Figure 10) tooth #37



Postoperatively, the patient was treated in the intensive care unit, receiving complex anti-inflammatory therapy, regular surgical wounds irrigations and dressings, for both intraoral and extraoral sites (Figure 11).

Complex anti-inflammatory therapy included:

1. Sol. Ampicillinum+sulbactamum(Sultamicillin) 3g (ampicillin 2g/sulbactam 1g) IV q8h (every 8 hours)
2. sol Metronidazole 500mg/100mL– IV q8h (every 8 hours)
3. sol Dexamethasone 4mg/1ml – IV q12h (every 12 hours)
4. sol Ketorolac 30 mg as indicated IV
5. Saline solution 0.9%– 500 ml – IV q12h (every 12 hours)
6. Ringer's solution 500 ml – IV q12h (every 12 hours)

After 4 days of inpatient treatment, the inflammatory process was recovered, there was no purulent discharge, the drains were removed (Figure 12), the patient was discharged home for outpatient treatment with recommendations and follow-up observation.

(Figure 11)



(Figure 12)



CONCLUSION

This case presented in this report demonstrates one of the most common odontogenic infection complications of the maxillofacial region and its inpatient surgical treatment. Patients with submandibular odontogenic cellulitis often present with apparent swelling in the submandibular area (sometimes additionally with the submental area), with complaints about painful swallowing, dysphagia, and trismus (due to involvement of the pterygomandibular and parapharyngeal spaces). Therefore, a suitable surgical approach is necessary to thoroughly drain the area and provide appropriate postoperative complex anti-inflammatory treatment. However, in case of improper surgical treatment and postoperative care, or even if left untreated, infection can spread to the nearby deep spaces and cause life-threatening conditions (deep neck infections, mediastinitis). To prevent any complications of odontogenic infections and reduce the need for extensive surgery, early involvement of dental professionals is necessary. In case of such complications, qualified maxillofacial surgeons are needed.

REFERENCES

- James R. Hupp, Edward Ellis III, Myron R. Tucker. (2019). Contemporary Oral and Maxillofacial Surgery. 7ed. (Principles of Management and Prevention of Odontogenic Infections 318–334; Complex Odontogenic Infections 335–363)
- Brad W. Neville, Carl M. Allen, Douglas D. Damm, Angela C. Chi. (2016). Oral and Maxillofacial Pathology. 4ed. (123–131)