Intraoral management of odontogenic infection associated with severe trismus under local anesthesia

Ann. Ital. Chir., 2021 92, 2: 116-118
pii: S0003469X21033637

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Trismus is defined as a tonic contraction of the muscles of mastication. It can also refer to limited mouth opening of any cause. Trismus is a classical symptom of masticatory space infections and it can be a sign of an infection in the anterior compartment of lateral pharyngeal space. Common causes in clinical practice followed by trismus are odontogenic infection which can be periodontal or pericoronal. This article will present a clinical report on intraoral management of mandibular odontogenic infection accompanied by severe trismus under local anesthesia using modified Akinosi technique in an outpatient environment. Treatment and postoperative period were routine. This kind of approach provides access to the infection at an early stage without general anesthesia, it shortens the hospital treatment and it enables faster recovery.

KEY WORDS: Local Anesthesia, Odontogenic infection, Trismus

Introduction

Trismus (T) is defined as a tonic contraction of the muscles of mastication. However, it can also refer to limited mouth opening due to any other cause. Roughly, causes of T distinguish between intra-articular, factors within the temporomandibular joint and extra-articular, where temporary T occurs much more frequently than permanent [1].

T is also a classical symptom of masticatory space infections. In clinical practice, we often encounter both odontogenic infections associated with T and non-odontogenic infections. If these infections go unchecked or if there is a delay in treatment, they can spread to various facial spaces of the head and neck, and lead to serious complications such as cervical cellulitis or mediastinitis.

Most clinicians treat T and infection with antibiotics and analgetics for several days waiting for the T symptoms to reduce in order to approach the cause of the problem. Sometimes, the same treatment leads to procedures that require treatment under general anesthesia due to extraoral incision and drainage. In order to avoid all of these, it is possible to manage infection as well as signs of T in local anesthesia (LA) in adequately selected patients. An appropriate clinical examination, understanding of in-vivo anatomy, and surgeon's experience in emergency medicine and emergency surgical care are essential for further treatment [2]. This article will present a clinical report on intraoral management of odontogenic infection accompanied by severe T under LA in an outpatient environment.

Case Report

A 26-year-old white, male patient was seen at the Dental/Medical Center of Maxillofacial Surgery, Aleja Centar, Banja Luka, Bosnia and Herzegovina, for evaluation of a painful left lower jaw associated with severe T. Previously, he visited his family doctor and got a referral to hospital treatment. Since the patient refused proposed public hospital treatment, he visited the Clinic in order to find easier and faster solution to the problem.

Pervenuto in Redazione Maggio 2020. Accettato per la pubblicazione Luglio 2020
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Anamnesis and clinical examination showed generally healthy but poorly nourished patient with slight edema of the left side of the body of the lower jaw and serious signs of T. Swallowing and speaking functions were not disturbed during examination. Further clinical and RTG OPT analysis pointed out to retained root in reg.36, 37 and 38 with a damaged crown (Fig.1). The last one was the main cause of infection and T. The patient was presented the planned procedure in detail. The goal was application of LA to the left inferior alveolar nerve, which would lead to the relaxation of the signs of T, analgesia and eventually intraoral management of odontogenic infection. Few hours before the intervention he was covered with potent antibiotic Xiclav 2 gr. The surgical procedure was carried out at the Clinic under LA. The initial incisal mouth opening was 8 mm (Fig.2 left, right). The left buccal cheek was retracted. The LA was applied using the long needle 0,38 x 40 mm in the buccal sulcus for the buccal nerve which is the sensory nerve of anterior division of mandibular nerve for teeth 36, 37, 38. 10 minutes were allowed for the LA to take effect, which slightly reduced the existing pain and made it easier to perform the following procedure.

Fig. 1: Patient RTG OPT.

Fig. 2: Patient with trismus (left and right).

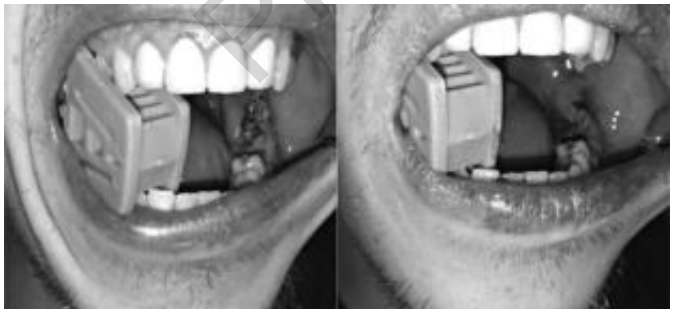

Fig. 3: Dental mouth opener applied before surgery (left), after surgery (right).

After that, the LA was applied again. This time to block the inferior alveolar nerve. Previous application of LA to the buccal nerve allowed the patient to open his mouth a bit wider, and for the surgeon to palpate more easily anterior margin of the mandibular ramus. Following that, Akinosi technique was used for application of LA. Since the patient opened his mouth a bit wider the cheek was retracted and the position of the needle was parallel with buccal cusps of the upper lateral teeth. In the original technique where mouth is closed the position of the needle is parallel to the mucogingival junction of maxillary molars. The needle penetrated in mucosa across the anterior margin and it was managed as laterally as possible in order to follow the angulation of the mandibular ramus. After 2 cm path, its apex was located in the upper pterygomandibular space in close contact with the inferior alveolar nerve. The LA was applied and the needle was pulled out.

20 minutes later there were signs of local analgesia and relieving of the muscle spasms. A dental mouth opener was successfully applied on the contralateral side, and the incisal mouth opening was about 30mm (Fig.3 left). The lingual mucosa was retracted from the damaged 38 tooth crown and pus was aspirated. The following surgical procedure was carried out using Bein elevator and strong surgical peanut. Retained root 36, 37 and 38 were extracted. The wound was curetted and two resorptive stiches in reverse fashion were applied in order to allow for a spontaneous drainage (Fig. 3 right). Following the surgery, the patient was released from the Clinic with instructions to continue with compulsory antibiotic therapy and painkillers as needed. The patient was seen first day following the surgery with no signs of pain. The following postoperative period was uneventful.

Discussion

T is a classical symptom of masticatory space infections and it can be a sign of infection in anterior compartment of the lateral pharyngeal space. Severe trismus-the inability to open mouth wider than 10mm-may be an indication of severe oral pharyngeal involvement of the infection [3]. In clinical practice common causes followed by T are odontogenic infection which can be periodontal or pericoronal.

Undoubtedly, the benchmark in these cases is the possibility for early implementation of the well-known surgical rule '*Ubi pus ibi evacua'.*

However, as there is no established protocol for such cases most clinicians cover patients with antibiotics and analgesics waiting for the signs of T to be released. Afterwards, they perform an appropriate surgical intervention, a wait-and-see policy. Sometimes the patient's immune system is not as strong as the prescribed antibiotic. It is also documented that due to immoderate use of antibiotics in the medical fields selection pressure on bacteria has increased and physicians find themselves facing the problem of antibiotic resistance more frequently [4]. It implies that infection begins to spread to different areas of the face and neck requiring an urgent treatment under general anesthesia in terms of extraoral incision and drainage. It is also proved that incidence of deep neck space infection was significantly higher in patients with dental abscess than in those without it [5]. This report presents a specific case which demonstrates previous experience with similar cases of the author of the report.

It also stresses the value of anamnesis and clinical examination. Once it was certain that odontogenic infection is a causative agent of severe T, the following necessary finding was that ingestion function was not seriously compromised. Few hours before the intervention prophylactic antibiotic of 2 gr.of amoxicilin with clavulanic acid was applied. In cases of odontogenic infection in region 38, 48 followed by T and soft tissue edema, the application of the classical Akinosi technique could be difficult and complicated. The presence of inflamed or infected tissue may impair appropriate onset of action, while patient's apprehension and pain often can cause local anesthetic failure [6]. Difficulties may be experienced with this technique when either a deformity exists or a tumour is present in the area of the maxillary tuberosity [7].

Described Akinosi technique from 1977 was slightly modified in this case by the author. Initial application of buccal anesthesia reduced the existing pain and made it easier to perform mandibular anesthesia. The mouth was opened a bit wider and the needle was placed parallel with buccal cusps of the upper lateral teeth. It helped the surgeon to easily palpate the intraoral bony landmarks and shorten the usual needle path from 3 to 2 cm. This kind of approach also allowed to circumvent the potential mild protrusion on the external oblique ridge of the anterior surface of the ramus immediately below the coronoid process and apply the anesthesia closer to the entrance of the mandibular canal. Once the T loosening and analgesia of the appropriate alveolar lower nerve have been achieved, intraoral access to the problem was open and possible.

In this case, the extraction enabled the removal of the cause of the infection as well as the drainage of the accumulated pus and debris. Since the main problem was resolved and further recovery took place in home environment, the patient's optimism and comfort were high immediately after the surgery.

Management of odontogenic infection accompanied by severe T via intraoral approach under LA can be an intervention that has many benefits. It provides access to the infection at an early stage without general anesthesia, it shortens the hospital treatment and it enables faster recovery. Moreover, the current and further situation with Covid-19 will affect the treatment of emergencies in surgery in general. Considering orofacial region, it will certainly require from oral & maxillofacial surgeons to resolve emergency cases if possible under LA with minimal hospital stay.

Its implementation requires a precise clinical diagnosis as well as precise application of the LA. The experience of a surgeon in emergency medicine is essential.

Riassunto

il trisma è definito come una contrazione tonica dei muscoli della masticazione. Può anche riferirsi a un'apertura limitata della bocca per qualsiasi causa. Il trisma è un sintomo classico delle infezioni dello spazio masticatorio e può essere un segno di un'infezione nel compartimento anteriore dello spazio faringeo laterale. Le cause più comuni nella pratica clinica seguite dal trisma sono infezioni odontogene che possono essere parodontali o pericoronali. Questo articolo presenterà un rapporto clinico sulla gestione intraorale dell'infezione odontogena mandibolare accompagnata da grave trisma in anestesia locale utilizzando la tecnica Akinosi modificata in ambiente ambulatoriale. Il trattamento e il periodo postoperatorio erano di routine. Questo tipo di approccio fornisce accesso all'infezione in una fase precoce senza anestesia generale, accorcia le cure ospedaliere e consente un recupero più rapido.

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