

Postextraction pain treatment possibilities

Davor Katanec¹
Ana-Marija Blažeković²
Zoran Ivasović¹
Božidar Pavelić³
Tihomir Kuna¹

¹Department of Oral Surgery,
School of Dental Medicine
University of Zagreb
²Fifth year student
School of Dental Medicine
University of Zagreb
³Department of Dental
Pathology
School of Dental Medicine
University of Zagreb

Summary

Postextraction pain or alveolitis sicca dolorosa is a complication which appears after tooth extraction, usually in the molar region of the lower jaw.

In this paper two methods were compared: conservative and surgical-conservative method.

The research was carried in order to establish which method is more advantageous and more effective. The pain treatment lasted for one year. Thirty patients were treated and each of them were separately conducted during three weeks after the treatment.

Fifteen patients were submitted to conservative therapy, and fifteen others to surgical-conservative therapy.

The results (tables and charts) show that both methods are effective and that both methods lead to symptom termination. However, surgical-conservative method appeared to be more effective, because in the first seven days after the therapy, approximately 75% of the patients no longer had alveolitis symptoms.

Key words: *alveolitis, postextraction pain, conservative therapy, surgical-conservative therapy.*

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Address for correspondence:

Doc. dr. sc. Davor Katanec
Zavod za oralnu kirurgiju
Stomatološki fakultet
Gundulićeva 5, 10000 Zagreb
Croatia
davorkatanec@yahoo.com

Introduction

Postextraction pain or dolores post extractionem is a pathological disorder of normal healing of a wound in which, because of many factors, the physiological formation of a blood clot does not occur or the blood clot disintegrates (colliquation). In both cases the consequences are the same. Local infection

of alveoli occurs and free nerve-endings are exposed to different mechanical, thermal and chemical impacts which result in the occurrence of intensive pain (1). This is usually a pulsing or sharp pain which is extremely painful at night. This kind of pain is a somatic, deep osteomuscular type that is bone-pain with the manifestation of central excitatory phenomenon (2). In fact, every postextraction pain which

lasts longer than 24 hours, or starts two to three days after tooth extraction may be diagnosed as *dolor post extractionem*. This complication is differently named in literature, i.e. *alveolitis sicca dolorosa*, *alveolgia*, *alveolar osteitis*, *dry socket*, and in this research we will call it by a term “*dolor post ex*” (1, 3).

The pain appears as a complication in 2-5% of all extractions. The most usual *alveolitis* localization is the molar region of the lower jaw. This region is present in 73% of the *dolor post extractionem* cases (4).

Etiological factors which influence the *dolor post extractionem* occurrence may be divided into general and local factors. General etiological factors, according to McGregor, are: D and E hypovitaminosis, hypoproteinemia, diabetes mellitus and oral contraceptives (5).

According to some authors (6), age, gender and inadequate mouth hygiene are very important in pain occurrence.

Of the local factors, Killey and Kay (7) mention that the trauma of the socket with rough manipulation and mucous and submucous injury, with remains of osseous particles and pieces of fillings and teeth are some of the most important factors in *dolor post extractionem* occurrence. Excessive wound rinsing during the first hours after the procedure may also lead to injury and tearing off the blood clot which afterwards cannot be fibrously organised.

Also, carbonated beverages may tear off the blood clot from the alveole (8).

According to some authors (9), weaker alveoli blood flow in the lower jaw and the inducement of ischemia with vasoconstrictors, which are added in local anaesthesia, are important factors in the occurrence of this problem.

Mouth bacterial flora is important for the occurrence of *dolor post extractionem*. In some circumstances, dynamic equilibrium in bacterial flora is disrupted in the area of the extracted tooth. In that case some nonpathogenic microorganisms become pathogenic and that leads to blood clot disintegration and local alveoli infection (*alveolitis sicca*). The influence of anaerobic microorganism *Treponema denticola*, which has strong fibrinolytic influence and leads to disintegration of blood clot, is very important. It is isolated in 75% of *dolor post extractionem*.

This pathogenic spirochete resettles mouth and produces enzymes which then mix with the defence mechanism of the host. Binding of a bacterium on fibroblasts results with cell death, and binding on to erythrocytes leads to agglutination and also cell death, which is a direct cause of blood clot decomposition (10, 11). This bacterium is usually connected to other periodontal diseases because it is isolated from gingival sulcuses and pockets (12, 13).

Each theory has its own advantages and disadvantages. Most probably, the sum of different systematic and local factors lead to *dolor post extractionem* if they occur at the same time.

The goal of the *dolor post extractionem* treatment is establishment of conditions in the alveolus which will lead to the formation of a healthy blood clot, its fibrous organisation and finally ossification and reshaping of the bone at the place of the extracted tooth.

The *dolor post extractionem* may be:

- Conservative therapy: it consists of rinsing of the alveolus and taking medical implants which have analgesic, antipyretic and antifibrinolytic effect.
- Surgical - conservative method: consists of excoriation of the blood clot decomposition, application of the medical implement and suturing of the wound.
- Surgical or radical therapy: after the excoriation of the socket, the wound is covered by the mucoperiosteal lobe.

The goal of this paper was to establish the most effective therapy method which would be the fastest way to eliminate *dolor post extractionem* symptoms and lead to blood clot stabilization which fills in the postextraction alveoli. This complication usually appears in everyday clinical work even after the most simple extractions. The pain intensity as the main symptom and long duration (up to 20 days), causes many problems to the patient and to the dentist. It responds slowly to therapy. It is very important to establish a unique doctrine in *dolor post extractionem* treatment which will be effective and acceptable to each clinical worker.

Materials and methods

The research included 30 examinees aged from 20 to 56 years who had *dolor post extractionem*

symptoms after extraction of one or more teeth. The research lasted a year and was carried out in the Department of Oral Surgery, School of Dental Medicine University of Zagreb.

The examinees were patients who came to the Oral Surgery Clinic because of pain which lasted for more than 2 days after tooth extraction .

After clinical and X-ray analysis, which confirmed dolor post extractionem diagnosis, we determined the appearance of the clinical wound (alveolus and soft tissue damage), type and intensity of the pain (Figure 1).

Intensity and type of the pain were measured on a so-called qualitative scale i.e. a subjective method during which the examinee describes the pain gradation from no pain to moderate and sharp pain. The examinee ranged his pain into a category such as sharp pain or dull constant pain.

For this purpose a questionnaire was devised. After a clinical examination one part was completed by a physician and the other part, on intensity of pain, was completed by the patient. The questionnaire consisted of: general data on the patient, intensity of pain, completed by the patient, and clinical data - X-ray and wound appearance, completed by the physician (Figure 2).

Half of the examinees, 15 of them, with moderate symptoms of dolor post ex (moderate pain with no mechanical damage to alveoli and soft tissues) were submitted to conservative treatment.

Conservative treatment consisted of basic alveoli rinsing with a ph. saline solution and placing an Apernyl implant. Apernyl is a drug which consists of acetylsalicylic acid which has an analgesic effect, and of paraoxybenzoic acid which maintains the formation of a blood clot (14, 15).

The other half of the examinees, 15 examinees with more intense dolor post ex symptoms (sharp pain with damaged mucous and traumatised alveoli), were submitted to surgical-conservative treatment.

Surgical-conservative treatment consists of firm excohleation of alveoli, i.e. removal of all blood clot remains from the alveoli and inducement of bleeding with implementation of an Apernyl implant in order to form a new, clean clot. The wound edges get closer by suturing with an individual suture or

single suture (3-0 cat gut). The procedure is performed under local anesthesia. Antibiotics with a wide spectre were given to examinees, (Amoxyl 3x500mg during 7 days). In the case of allergy to Penicillin, we gave Klindamicin (Dalacin C or Klimicin 3x150mg during 7 days).

After the procedure, the examinees were supervised for the next 3 weeks. During each medical examination a clinical examination of the wound was made. The pain intensity was measured by a qualitative scale, i.e. by a subjective estimate of the examinee - both treated by conservative and surgical-conservative method.

From the time of arrival in the Clinic of Oral Surgery to the dolor post ex symptom termination, each examinee completed the questionnaire with his physician (Figure 2). At the end of the investigation, all data were processed and shown in percentages.

Results

All data were shown in tables and percentages.

Out of 30 patients with postextraction pain, 15 were subjected to conservative treatment and 15 to conservative-surgical treatment.

All data were shown graphically for better presentation (Figures 3 and 4).

By comparison of both the above treatments of dolor post ex, we obtained these results: the first day after the therapy all patients treated by surgical-conservative method had intense pain.

Seven patients treated by conservative method felt moderate pain, eight had sharp pain. After the first week of treatment, the number of patients with sharp pain treated by surgical-conservative method decreased. Only four patients had sharp pain after the first 7 days. Eight patients treated by conservative method experienced sharp pain. Two weeks later, only one patient felt sharp pain during surgical-conservative method. Ten of them had no more symptoms. Seven patients treated by conservative method felt sharp pain and only two had no more symptoms.

Three weeks later, all patients treated by surgical-conservative method had no more symptoms, while three patients treated by conservative method

still felt moderate pain which stopped 24 days after the beginning of therapy.

Discussion

According to the results of the study, the surgical-conservative method appeared to be better compared to the conservative method both practically and theoretically. With excoheation of the decomposed blood clot, we cleaned the socket of necrotic tissue and bacteria, and provoked fresh bleeding to form a new clot. A component of Apernyl medication, paraoxybenzoic acid, has an important role in the formation. We placed it in the alveoli after the excoheation. Its second component, acetylsalicylic acid, works symptomatically, i.e. it reduces the patient's pain. The procedure ends with the suturing of the wound edges with one suture, which then protects the wound from external influence and prevents the clot falling off. Since antibiotics are prescribed to the patients, the possibility of the occurrence and development of bacterial infection is reduced to a minimum. The whole procedure is done under local anaesthesia which makes it pleasant for the patient.

Many authors (16) have studied this problem in their research. Fedorov reports the possibility of treating dolor post ex with a physical method of vibration in the socket, after which medicamentous pastes are used. With the severe cases of this complication, on the first day after treatment of the wound by this method, the pain is removed and, in comparison with the traditional methods of dolor post ex treatment, much faster healing up is achieved.

When analysing surgical-conservative methods, Musbock (17) mentions the use of

Koller paste which is introduced into an alveole, tamponed by iodoform band, and the gingival walls pasted, so that they are not exposed to the influence of saliva. After 14 days, the iodoform band is taken out and the whole procedure is repeated if needed. He also mentions the surgical method of dolor post ex. treatment by grinding of alveole according to Gabka and Koller. In this case, the alveolus needs to be freshed up to the point of severe bleeding. Then, the treatment is continued with medications or surgically, by covering with mucoperiostal lobe.

After the excoheation of the socket, Klammt and his associates (18) applied trapezoidal vestibular mucoperiostal lobe. 3-6 days before tooth extraction, Semenčenko and his associates (19) applied lizozym enzyme and determined decreased occurrence of dolor post ex. They explain this effect by the decrease of pathogenic microorganism concentration, as well as biological characteristics of the preparation, which enables fast regeneration.

In the prevention of alveolitis occurrence Swet and associates (20) used mouth rinsing with different medications: 0.9% solution of NaCl, 1% solution of Kloramin-T, providon iodid or sodium bicarbonate. The greatest percentage of postoperative pain was experienced by the patients who rinsed their mouth with ph. saline solution.

Rinsing with different antiseptics led to decreased frequency of alveolitis with prophylactic factor, regardless of the medication type. Kojundžić (21) conducted wide research on the possibilities of alveolitis treatment. One of the methods was the combination of surgical-medicament treatment, with the additional usage of antibiotic implant. Neocones is an antibiotic-analgesic preparation which consists of: Sulphate de polymixine B that has an effect on gram -negative bacteria, Tyrothricine which has an effect on gram -positive bacteria and spirohete in the mouth, Neomycine has a wide range of impact and Chlorhydrate de tetracaine - local anaesthetic. Neocones implant is used for the purpose of preventing the local bacterial impact. Besides that, he exposed patients to the impact of X-rays in the area of the dry alveole in order to achieve better blood flow in that area. By doing so, they tried to eliminate the often reported etiological factors, clot infection and weak blood flow of the alveole. The second method was exclusively the surgical method of treatment. The novelty introduced by this method was the forming of a lobe which practically seals the alveole and protects the clot from mechanical impact, food, saliva, tongue, etc. By sealing the alveoli with Wasmund lobe, the sterility of the clot was ensured, although its bacterial impact could not be avoided. It may even be said that the conditions for impact of anaerobes were improved.

In comparison with the results obtained in the above-investigations, the surgical-conservative method of dolor post extractionem treatment, applied in our

investigation, gives equally good results and any clinical worker can simply apply it.

Conclusions

According to the results of the study presented in the tables and graphically compared, we can see that both methods are effective, although the surgical-conservative method appears to be more effective. According to these results, we can conclude that

improvement of the symptoms started during the first week in the majority of cases. After three weeks of therapy, all pain had practically gone. In contrast to the previous method, the conservative method gave no results. We only noticed slow improvement over a longer period of time.

In the end we can conclude that the surgical-conservative method is more acceptable and available to every clinical practitioner. It is definitely the method that should always be applied, at least in the region of the lower jaw.