

ACCIDENTAL EXTRUSION OF SODIUM HYPOCHLORITE DURING ENDODONTIC TREATMENT: A CASE REPORT

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ABSTRACT

The goal of endodontic therapy is the sanitation of the root canal system in the best possible way. At this stage of treatment is carried out chemical - mechanical preparation, comprising the action of the instruments on the walls of the ducts associated with an auxiliary chemical substance. Sodium hypochlorite is widely used as a sprinkler agent during endodontic treatment because it has a good antimicrobial activity, be solvent of organic matter present in the infected root canal. However, when this solution is injected and accidentally leaked beyond the root apex may cause complications to the patient. This article describes the characteristics of a clinical case of sodium hypochlorite leakage in the element 15 as well as the treatment given in case, for the same resolution.

KEYWORDS: Endodontics, irrigation, extravasation, sodium hypochlorite.

1. INTRODUCTION

The main goal during channel treatment is the complete debridement of connective tissue and the elimination of surplus microorganisms found in infected root canals. In addition, it aims at effective sealing, so that bacterial recolonization does not occur in the root conduits¹.

In order to effectively clean the root canals, it is essential to use irrigating solutions during the biomechanical preparation in order to eliminate or minimize the bacterial colony residing in the canals, as well as the dissolution of the tissues promoting cleansing and chelating action².

According Pécora & Estrela (2004)³, when pulp necrosis during endodontic treatment is necessary, the antimicrobial effect must prevail in association with tissue dissolution capacity. As a solution of choice we can use Sodium Hypochlorite which is available in different concentrations between 0.5% and 2.5%.

We can observe that the Sodium Hypochlorite has properties that aid in a correct chemical-mechanical debridement in the root canals. It acts as a lubricant for in-

strumentation, neutralizes toxic products, has solvent action and detergent. And it still acts on a large scale of microorganisms⁴.

The higher the concentration of sodium hypochlorite solution, the greater its ability to dissolve living or necrotic tissue, and the greater neutralizing action of the root content. However the more concentrated the more irritating it will be to the apical and periapical tissues⁵.

The occurrence of accidents with sodium hypochlorite is infrequent, but when they occur they generate complications for the patient. In these cases, the patient should be informed of the possible sequelae and the duration of treatment. In the majority of cases, accidents with NaOCl have a favorable prognosis, requiring immediate and adequate treatment, and a cautious analysis of the situation⁶.

The objective of the present study is to report a case of hypochlorite extravasation during endodontic treatment, as well as the conduct of choice that was performed to treat the surgical accident.

2. CASE REPORT

A 39 year old female patient attended a private dental clinic in the city of Umuarama - PR, reporting a sensitivity to touch and chewing in the right maxilla region. During the anamnesis, she reported that this sensitivity had accompanied him for years and in recent months had been increasing. Clinically, a slight sensitivity to palpation was observed in the groove bottom region, near the apex of element 15, and a slight edema in the periapical region of said element. Faced with the pulp vitality test, he presented a negative response. Radiographically, a radiolucent image is observed in the periapical region, suggestive of endodontic lesion (Figure 1).

In the first session, after prophylaxis of the involved element and absolute isolation of only the tooth 15, the coronary opening was then performed and we obtained access to the canal embouchure. The pulp chamber ceiling was removed and the position of the canal path of

the element was performed with pre-bending maneuvers endodontic files of the number 10, K type (Dentsply, Maillefer - Switzerland).



Figure 1. RX panoramic initial.

It was possible to locate and exploit any extension of the main conduit of said element. The mechanical-mechanical preparation of the canal was performed using the rotating files of the Prodesign S system (Easy, Belo Horizonte - Brazil) in the sequence proposed by the manufacturer. As an irrigating solution was 2.5% sodium hypochlorite.

At the end of the sanitization maneuver of the root canal system, the patient began to complain of a burning sensation in the region, which increased in intensity rapidly, accompanied by rapid facial edema in the region (Figure 2). It was then suspected that a possible extravasation of sodium hypochlorite in the periapical region, since the signs and symptoms are characteristic of this picture. At this moment, a saline irrigation with profuse saline was performed, in order to attenuate the irritation caused. We chose not to perform intracanal medication in this session to avoid further chemical trauma in the periapical region.



Figure 2. Photo of the patient on the same day as the accident.

Following the protocol described by Pinheiro *et al.* (1998)⁷ and Witton *et al.* (2005)⁸, antibiotics were prescribed (Amoxicillin 500 mg). Its use is recommended in these cases of extravasation of sodium hypochlorite, due to the presence of necrotic tissue and risk of infection. However, in more severe situations, hospitalization and support measures become prudent in order to avoid a worsening of this situation^{7,8}. It was also asked to apply ice in the region in the first 24 hours, aiming to reduce edema. In order to alleviate the discomfort, it was also prescribed the use of analgesic. Aiming to facilitate oxygenation and possible drainage of maxillary sinus supuration, a nasal nasal decongestant Rinosoro 0.9% - Sodium Chloride 9.0mg/ mL 30ml - Farmasa.

Patient follow-up occurred daily for a week after the accident. On the first day, the patient reported increased edema and increased burning sensation, with stabilization of the pain sensation. Clinically, the edema almost completely affected the right facial region, including the labial region (Figure 3). Already on the second and third days, the facial edema remained, but the painful sensation gradually regressed. After the fourth day, the edema was regressing and was already painless. Six days later, the patient showed a normality, with no signs and symptoms, returning to the clinic to continue the endodontic therapy.



Figure 3. Photo of the patient 24 hours after.

3. DISCUSSION

The toxic effects of irritation of Sodium Hypochlorite have been described in several case reports^{1,3,9}, where an accident was presented with the solution. If an accident as described above occurs, a treatment protocol should be instituted to minimize possible damage. Initially a solution of saline solution should be injected into the canal of the root canal aiding in the total elimination of the hypochlorite still present. When we notice some

damage, we prescribe antibiotics to reduce the risk of a secondary infection associated with the prescription of analgesic for pain relief. It is also recommended to apply ice on edema in the first 24 hours¹⁰.

The treatment of pain, if present, serves only as an attenuator, and it is necessary to wait for the remission of symptoms through the follow-up of the case, as explains by Rendón *et al.* (2004)¹¹.

To avoid accidents with hypochlorite, it is recommended to use absolute insulation during endodontic treatment, putting protective goggles on the patient and the operator. The irrigation needle should preferably be bevelled, should not be fair to the channel, and should have a safety margin of at least 2mm in relation to the working length; should be irrigated slowly without exerting excessive pressure¹⁰.

García Zulunga *et al.* (2001)¹² report that the possibility that the disinfectant agent, used in the irrigation of the root canals, come into contact with the periradicular tissues and other adjacent structures is high.

Ehrich *et al.* (1993)¹³ Reported a clinical case of endodontic treatment in the right upper first molar, tooth 16. Where shortly after irrigation of the palatine canal with 5.25% sodium hypochlorite solution the patient complained of a bad taste in his throat. When the palatine canal was irrigated with saline solution, it was observed that the serum passed to the maxillary sinus and to the nasal cavity through the foramen along the lateral wall of the maxillary sinus. The patient complained of a mild burning sensation and an initial congestion. García Zulunga *et al.* (2001)¹² report that the possibility that the disinfectant agent, used in the irrigation of the root canals, come into contact with the periradicular tissues and other adjacent structures is high.

Barbas *et al.* (1987)¹⁴ reported a clinical case of fatal cerebral haemorrhage in a 52-year-old woman who underwent endodontic treatment and who, due to the extrusion of sodium hypochlorite into the maxillary sinus, reached the V cranial nerve.

Kavanag & Taylor¹⁵ (1998) reported a clinical case similar to that described in this case report, where during endodontic treatment of the second right upper premolar the sodium hypochlorite solution was injected into the maxillary sinus. The patient presented severe pain and swelling in the region due to extravasation of the solution.

4. CONCLUSION

Based on the clinical case reported, we conclude that knowledge of the factors that can lead to this type of accident can be decisive to avoid it. However, from the moment of its occurrence, early recognition and adequate management of complications and symptoms is essential in cases of sodium hypochlorite extrusion. Where each patient should be treated according to the

magnitude and type of extravasation that occurred during clinical practice.

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