

## Accidental Injection of Sodium Hypochlorite into Buccal Mucosa Before Endodontic Treatment: Case Report

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Cite this article as: Aslan M, Özcan M. Accidental injection of sodium hypochlorite into buccal mucosa before endodontic treatment: case report. *Essent Dent*. 2023;2(2):66–69.

### Abstract

Sodium hypochlorite is the most commonly used irrigation solution during root canal treatment in endodontic procedures. Besides its antimicrobial properties, the most important advantage of sodium hypochlorite is that it is a good organic tissue solvent. Its use in the wrong (accidental) area or in high concentration can cause tissue ulcers, nerve damage, necrosis, tissue loss, and sometimes irreversible damage due to its toxic effect. In this article, a presentation was made about the process that occurred in the buccal mucosa and the management of necrosis as a result of the accidental administration of sodium hypochlorite instead of local anesthesia to a 36-year-old male patient. Care should be taken during the treatment process and surgical treatment should not be rushed. Considering that there may be tissue losses and stenosis, the treatment should be done patiently and the most appropriate time for intervention should be observed.

**Keywords:** Buccal mucosal necrosis, endodontic treatment, sodium hypochlorite

### INTRODUCTION

Sodium hypochlorite (NaOCl) is the most preferred irrigation solution for the cleaning of root canals in endodontic treatment, thanks to its antimicrobial property (antiviral, antibacterial, antimycotic) and its ability to dissolve organic tissue.<sup>1</sup> Free chlorine released by NaOCl in the form of hypochlorite ions oxidizes enzymes irreversibly and ensures its perfect use against microbiological agents.<sup>2</sup> Sodium hypochlorite is also very effective in flushing and removing loose debris within the canal cavity due to the deep insertion of irrigation needles apically.<sup>3</sup> Sodium hypochlorite is highly alkaline (pH 11–12.5), is a strong protein oxidizing agent, and is highly toxic and lethal to various human and animal tissues in various studies.<sup>3,4</sup> Therefore, in inappropriate or improper use, NaOCl is very toxic and damages oral soft tissues, periradicular vasculature, periradicular tissues, and cancellous bone.<sup>3</sup> Before endodontic treatment, treatment management after buccal mucosal necrosis that developed with faulty sodium hypochlorite injection for mandibular nerve block was presented.

### CASE PRESENTATION

A 36-year-old male patient was referred to our clinic from the emergency department after a procedure performed by the dentist. From the patient's history, it was learned that root canal treatment was planned for the lower right molar tooth area. The procedure was interrupted due to the accidental administration of sodium hypochlorite to the mandible ramus and its surroundings for local anesthesia, and it was learned that the patient was discharged without medical treatment with recommendations. The patient was referred to our clinic with severe swelling and pain in the right half of the face within 4–5 hours. The patient had root canal treatment before and did not experience any problems. In the examination, swelling, edema, and hyperemia on the right facial half, as well as black necrotic areas on the right buccal mucosa, were observed in the oral examination, but the patient did not have facial paralysis (Figure 1). Pharyngeal pathology was not observed in the endoscopic examination of the patient, and computed tomography of the patient was planned. In the computed tomography of the patient, edema and

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Received: January 08, 2023  
Accepted: March 27, 2023  
Publication Date: June 26, 2023



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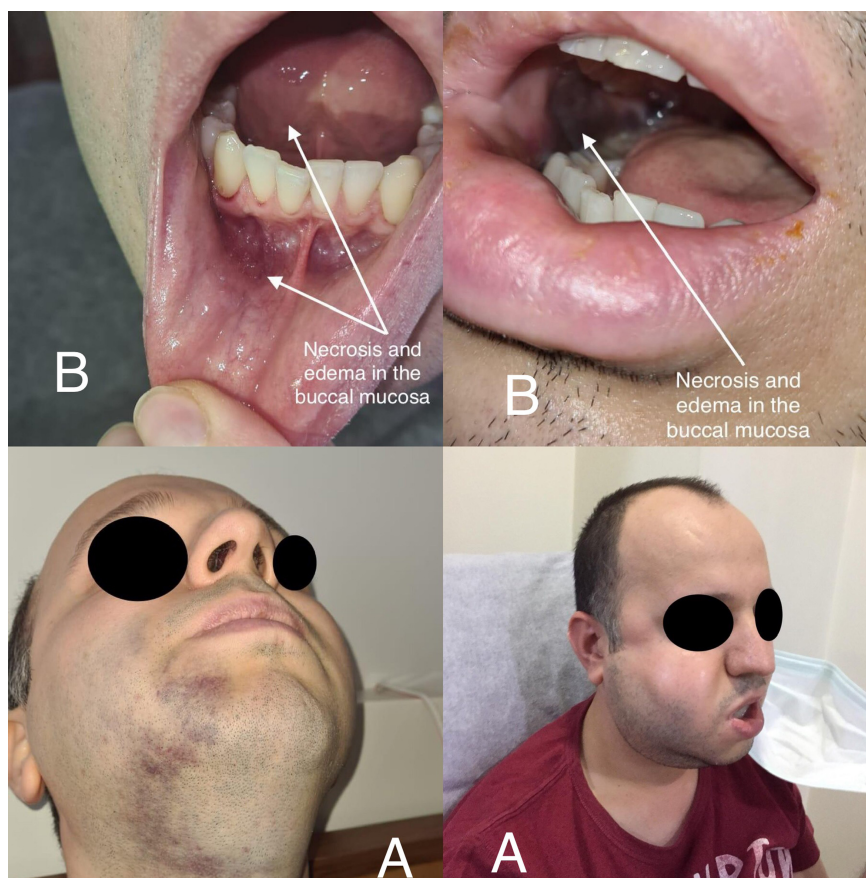


Figure 1. (A) The appearance of the patient's face before treatment. (B) The appearance of intraoral lesions before the treatment of the patient.

necrosis areas were seen in the right buccal mucosa (Figure 2). In the light of the patient's examination, radiological examination, and the information obtained from the clinic where the patient received treatment, it was understood that the clinical picture developed as a result of incorrect injection of 2–3 mL sodium hypochlorite (1.5%). The patient was hospitalized for observation and treatment. In order to prevent secondary bacterial infection in the patient, IV antibiotherapy (ceftriaxone 1 g/I.V., 2×1, 3 days; metronidazole 500 mg/I.V., 3×1, 3 days), anti-inflammatory agent (dexketoprofen trometamol 50 mg equivalent/I.V., 3×1, 3 days), analgesic agent (paracetamol 10 mg/ml/I.V., 3×1, 3 days), antireflux agent (esomeprazole sodium 40 mg equivalent/I.V., 2×1, 3 days), single-dose IV corticosteroid, cold compress, and semi-fowler bed rest were given. The patient's complaints regressed 24 hours after the start of treatment. The patient was discharged on the third day of the treatment and at the control 4 weeks later, the patient was fully recovered (Figure 3). Information about the patient was used with the consent of the patient.

## DISCUSSION

Root canal treatment forms an essential part of general dental practice. Sodium hypochlorite is the most commonly used

irrigant in endodontics due to its ability to dissolve organic soft tissues in the root canal system and its action as a potent antimicrobial agent. It should be used in endodontics in a concentration range of 0.5%–6%, and its use in high concentrations and/or amounts is highly toxic to living tissues.<sup>5</sup>

When the literature is reviewed, 3 types of NaOCl extrusion accidents are generally seen. It is seen in the form of careless iatrogenic injection, extrusion into the maxillary sinus, and extrusion or infusion of NaOCl from the root apex to the periradicular areas.<sup>3</sup> It occurs most frequently as the extrusion or infusion of NaOCl from the root apex to the periradicular regions. There are very few articles in the literature about the accidental injection of NaOCl. Motta et al<sup>6</sup> presented a case of who was accidentally injected with NaOCl into the buccal mucosa instead of an anesthetic solution.<sup>6</sup> Gursoy et al<sup>7</sup> presented a case of NaOCl accidentally injected into the palatal mucosa. In 1 review, Zhu et al.<sup>3</sup> accidentally mentioned the injection of NaOCl into the pterygomasseteric space. The remaining literature deals with the extrusions of NaOCl during irrigation during root canal treatment.

As a result of an incorrect injection of this solution during dental procedures, the patient feels sudden and severe pain

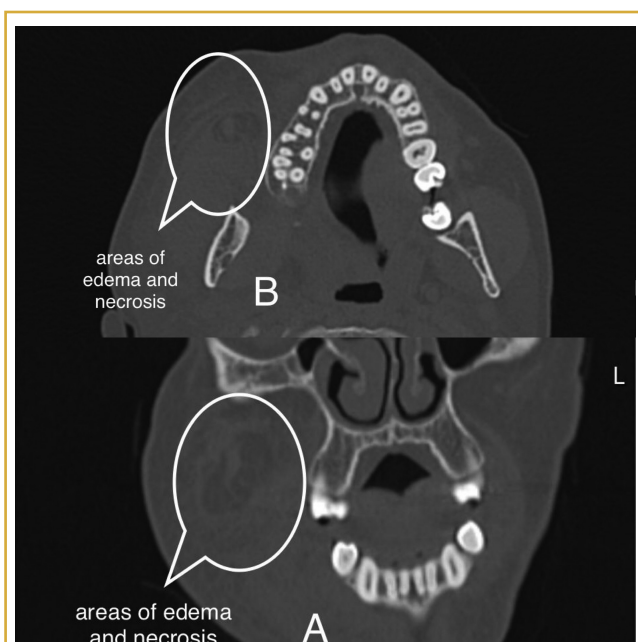


Figure 2. (A) Computed tomographic image of the patient in the coronal plane. (B) Computerized tomographic image of the patient in the axial plane.

in the injection area.<sup>8</sup> Hematoma, necrosis, and ecchymosis can be seen. As soon as misuse of NaOCl is noticed, negative aspiration is recommended, if possible. The patient should be informed in detail about the situation. Serious cases should be treated by hospitalization. It is beneficial to use antibiotic therapy in terms of necrosis and secondary infection.<sup>9</sup> In addition, it is useful to apply cold compresses for the first 24 hours. Sodium hypochlorite accidents are a complication that can range from a mild clinical picture to airway emergencies and should be treated patiently by an otolaryngologist.<sup>9</sup> The patient should be followed closely and the current treatment status should be planned as a result of examination and radiological examinations.<sup>10</sup>

In conclusion, NaOCl accidents are accidents that can be morbid and even mortal. If possible, the treatment of such patients should be done in the hospital and with close follow-up. Considering that there may be tissue losses and strictures, the treatment should be done patiently and the best time should be watched for the intervention.

**Ethics Committee Approval:** It was prepared as a case report, and ethics committee certificate is not required for case reports.

**Informed Consent:** Written informed consent was obtained from all patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – M.A.; Design – M.A.; Supervision – M.A.; Resources – M.Ö.; Materials – M.Ö.; Data Collection and/or

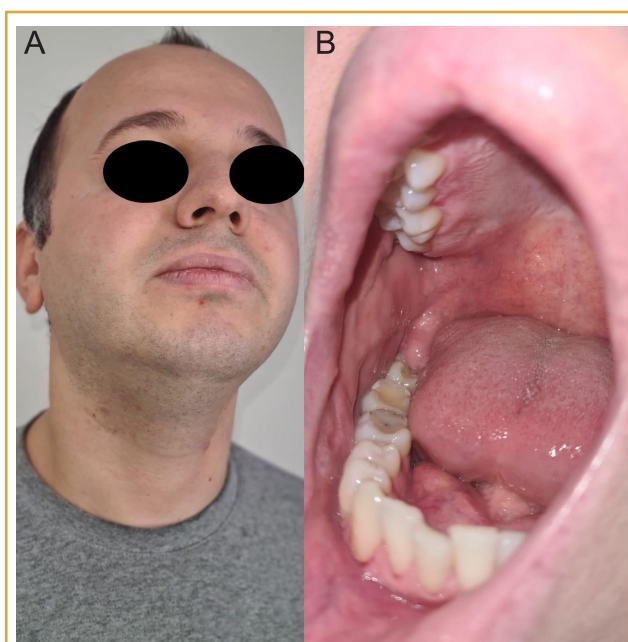


Figure 3. (A) The appearance of the patient's face after treatment. (B) The appearance of intraoral lesions after the treatment of the patient.

Processing – M.Ö.; Analysis and/or Interpretation – M.A.; Literature Search – M.Ö.; Writing Manuscript – M.A.; Critical Review – M.A., M.Ö.; Other – M.A., M.Ö.

**Declaration of Interests:** The authors have no conflicts of interest to declare.

**Funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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