CASE REPORT

ACCIDENTAL HYPOCHLORITE INJECTION : A CASE REPORT

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ABSTRACT

Local aneasthetic solution i.e; 2% lignocaine hydrochloride and 0.5% to 5% sodium hypochlorite solution is commonly used in root canal treatment in dentistry. Besides being a good antimicrobial agent, sodium hypochlorite is extremely tissue toxic. Hence, careful handling of the solution is highly recommended. This article discusses a case report involving an inadvertent injection of NaOCl instead of anesthetic solution before starting an endodontic procedure. Proper management following the event can reduce the complications. Preventive measures are to be taken to avoid such an unfortunate event.

KEY WORDS

Inadvertent injection; Local anaesthetic solution; Sodium hypochlorite

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INTRODUCTION

Successful endodontic treatment requires copious irrigation with an antimicrobial agent in the root canal system of a tooth. Sodium hypochlorite (NaOCl), having satisfactory antimicrobial properties, soft tissue dissolving, and canal lubricating effects, makes it a very popular root canal irrigant solution.[1] But any concentration of NaOCl is extremely cytotoxic.[2] The severity of its toxic effect is proportional to the volume, concentration, and temperature of the hypochlorite solution. NaOCl is hemolytic in nature. It degrades endothelial cells, fibroblasts, and ability to degenerate cancellous bone, can induce inflammation and produce ulceration when reacting with organic tissues.[3] Before starting root canal therapy for a vital tooth, a local anaesthesia is recommended. Both the solutions, i.e., lignocaine hydrochloride and hypochlorite, are clear and similar in colour and consistency. Hence, there is always a chance to be interchanged and cause an iatrogenic error in the injection of NaOCl instead of local anaesthesia. Precautionary steps are recommended to avoid iatrogenic mishaps and medico-legal complications.

CASE REPORT

A 32 years old female patient was referred to North Bengal Dental College and Hospital with severe pain and swelling on the left side of the face from a nearby private clinic. It was reported from the clinic that a mishap happened when a hypochlorite solution was accidentally administered in the left maxillary molar region during the root canal treatment. 2% lignocaine hydrochloride and sodium hypochlorite solution were dispensed in two similar local anaesthetic cartridges. A Postero Superior Alveolar (PSA) nerve block was supposed to be administered before starting the endodontic procedure. Inadvertently, NaOCl was injected into soft tissue space related to the left maxillary second molar region in lieu of a local anaesthetic solution. Immediately, sudden and excruciating burning pain occurred related to that region. As soon as the inadvertent error was recognized, root canal treatment was deferred, and the patient was sent to

FIGURE LEGENDS
Figure 1(F1): Day1, Figure 2(F2): Day3, Figure 3(F3): Day7,
Figure 4(F4): Day12, Figure 5(F5): 1 month; 3 finger mouth opening, Figure 6(F6): 3 month

our hospital with the attendant of the clinic within 30 minutes, as reported.

The patient was immediately attended to and reassured. A diffuse local edema developed both extraorally and intraorally. No bruise, ecchymosis or ulceration was observed. The vision was normal, as stated by the patient.

Cold compression was applied immediately for 30 minutes in the department, followed by a prescription of Amoxycillin 500 mg along with Clavulanic acid 125 mg and Metronidazole 400 mg given thrice daily after meals, a non-steroidal anti-inflammatory drug Aceclolofenac 100 mg, and Paracetamol 325 mg given twice daily after a meal for 5 days. Tablets Trypsin and Chymotrypsin were also added to be taken 4 times a day before meals for 5 days, along with an antihistamine drug, Cetirizine 10mg, prescribed once daily for 5 days. The patient was observed for an hour. Cold compression for 24 hours, followed by a mouth bath with lukewarm saline water, advised for the next 7 days. The patient was asked to report for the next 3 consecutive days. The swelling and pain increased in the following 24 hours. On clinical examination, after 48 hours, reduced mouth opening, i.e., 2 fingers with respect to the patient found and the patient developed difficulty swallowing after 72 hours. On bi-digital palpation, a firm nodule of approximately 40×25 mm2 size was found in the left buccal mucosa. Paresthesia related to the left buccal mucosa and gingiva related to the left maxillary posterior tooth region was reported. The clinical examination after 48 hours and 72 hours revealed no bruise or ecchymosis extraorally, and no intraoral ulceration was present at the injection site. The blurring of vision was not reported for any of those three successive days. The prescribed medication was continued for 7 days.

A 7-day follow up revealed a marked reduction in swelling. Pain was absent. But trismus persisted. A few firm, discrete nodule like tissue structures were palpated bi-digitally in the left buccal mucosa. The mouth opening was the same. Dysphagia had improved, though soft tissue paresthesia persisted. Cefalexin 500 mg to continue thrice daily for 5 days, Trypsin and Chymotrypsin thrice daily for the next5 days, a prebiotic and probiotic for 15 days, and vitamin B12 and folic acid supplements for the next 15 days were given. Mouth baths with lukewarm saline water and Oro-motor exercises were advised for 15 days.

The next follow up on the 12th day showed stiffness of muscle related to the left buccal mucosa. Pain during the opening of the mouth persisted. However, soft tissue paresthesia was absent. Sensation returned to the left buccal mucosa and left maxillary posterior gingival. The antibiotic was

discontinued, keeping all other advice the same. A combination of the muscle relaxant Chlorzoxazone 500 mg, Diclophenac Potassium 50 mg, and Paracetamol 325 mg was prescribed for 5 days. All the adjunctive medicine and Oro-motor exercises were advised to continue along with Rabeprazole 20 mg, once before breakfast.

After 1 month, mouth opening increased to 3 fingers with difficulty with respect to the patient. The stiffness of the muscle improved, though completely not cured. A single firm, palpable mass like structure of size 25×15mm2 was present in the left buccal mucosa. All the medications were advised for discontinuation.

The patient was again evaluated after 3 months. Mouth opening was 3 fingers without difficulty with respect to the patient. The size of the firm mass in the left buccal mucosa was reduced to 10×8 mm2.

DISCUSSIONS

Sodium hypochlorite, a common root canal irrigant, being cytotoxic can lead to hypochlorite accident when extruded. Different articles were present on accidental hypochlorite injection[4,5] instead of local anesthesia. All cases showed sudden burning pain with sudden progressive edema because of the defensive tissue response. A similar type of reaction was observed in the present case. Most of the accidents produced local ulceration and ecchymosis due to the dissolution of blood vessels and hemorrhage around the subcutaneous tissue[6], which was not observed in our case, most probably because a supraperiosteal infiltration was administered in most of the literature, whereas a PSA block was administered in our case as per the report of the attendant, where the solution was injected in a deeper tissue space. This could be possibly because the hemorrhage was masked by the superficial muscular and subcutaneous fat layers. Trismus was observed in this case, probably because of the involvement of the muscles of mastication, where the medial and lateral pterygoid muscles are most likely to be involved. Certain articles also mentioned motor deficits and paresthesia, which were found to be present for 3 months to 3 years.[7] A sensory nerve paresthesia was observed in our case, probably because of the involvement of the sensory branches of the maxillary nerve which returned to normal within 15 days of the said accident.

Almost all the articles related to hypochlorite accidents advised cold compression for 20 minutes every hour for thenext 24 hours, followed by lukewarm saline mouth bath after 24 hours. This is because the cold compression will cut down on the initial inflammatory response to some extent, thereby reducing pain and edema. Similarly, lukewarm saline water will increase blood flow due to the vasodilation effect to facilitate wound healing. Routinely, a prophylactic antibiotic along with a good anti-inflammatory agent is prescribed for at least 2 weeks to avoid secondary infections, as has been noted in most of the articles. However, some clinicians advised having judicious judgment before prescribing antibiotics. Topical/oral/IV Dexamethasone also recommended in a few literatures, which we did not follow, as a steroid can weaken the defense mechanism of the damaged tissue area, which is prone to infection, and also delay the healing process.[5] Hence, we avoided the use of steroids and administered enzymes like trypsin-chymotrypsin, which can facilitate tissue repair and better resolution of inflammatory symptoms, resulting in speedy recovery.[8] Most of the signs and symptoms were resolved within 10-15 days in our case, which has a far better response than others. The allergic potential of sodium hypochlorite has also been reported by Sulzberge et al.[9] Hence, an antihistamine is always recommended after such an accident which we followed. In our case we have encountered difficulty opening mouth because of the muscle spasm responsible for opening the mouth. Therefore, we administered a muscle relaxant for 7 days and advised Oro-motor exercises and a warm saline, mouth bath to overcome the muscular spasm. After one month, the patient had improved mouth opening, though with some difficulty. Hence, similar regime was advised for another two months, which had promising outcome.

Fortunately, all the clinical symptoms were resolved in this case within 3 months, except for the presence of a firm mass in the left buccal mucosa related to the left side of the occlusal plane. The patient was informed that complete healing would require time.

CONCLUSION

The practice of loading similar looking solutions into same cartridges is needed to be discontinued. It is always recommended to use side vented needles, labeled cartridges and silicon stopper to prevent such accidents.

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