CASE REPORT

Hypochlorite mishap: A manageable tragedy!

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Abstract:

Chemical irrigant are indispensable part of root canal therapy and sodium hypochlorite is used immensely for the same. Despite being an excellent lubricative agent as well as bactericidal in nature it is caustic to soft tissues. Sometimes spillage or extrusion beyond the apical foramen can cause chaos, both for patient as well as to the clinician. So, this case report draws attention to successfully manage such cases with least discomfort.

Key Words:Chemical irrigant, Sodium Hypochlorite, Root canal therapy, spillage, leakage

Introduction

Chemical irrigant plays an integral role for the success of root canal treatment (RCT). Among different kinds of irrigant sodium hypochlorite (NaOCl) is widely used at a concentration of 0.5-5.25%.[1] During mechanical shaping of canal it acts as both bactericidal and lubricating agent.[2]

It is a potent cytotoxic chemical as it reacts with organic tissues by the process of saponification.[3]

Amongst all the advantages care has to be taken while handling NaOCl since it is highly caustic to soft tissues.[4]On contact with vital structures it causes ulceration, hemolysis, inhibition of neutrophil migration and endothelial and fibroblast cells damage.[5] Vascular permeability is impaired due to blood vessel damage and release of chemical mediators, which leads to interstitial haemorrhage resulting in swelling and bleeding.[5]

Various preventive measures are mandatory like wearing appropriate personal protective equipment, high volume suction and using well sealed rubber dam that can prevent fatalities to skin, eyes, ingestion or aspiration.[6]

The anatomy of head and neck is quite complex and injury to peri-radicular and soft tissues results in extensive tissue damage due to severe inflammatory response.[7]

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This article presents a case report of hypochlorite mishap and its successful management.

CASE REPORT

A 30-year-old patient came to the Department of Periodontics, Kothiwal Dental College and Research Institute Moradabad with the complaint of pain in lower right back tooth region and she also complained of difficulty in mouth opening. On clinical examination Pericoronitis was diagnosed irt48.Further #47 presented with gross caries along with gingival polyp. So, operculectomy was planned followed by removal of gingival polyp. On removal of gingival polyp, pulp was involved and hence root canal treatment was also adviced. During the first day under local anaesthesia root canal was initiated irt 47. After access opening, during shaping of the canal sodium hypochlorite was used for irrigation. After completion of cleaning and shaping patient complained of numbness in the lower back tooth region which was thought to be extended effect of local anaesthesia. But after 4-5 hours she reported of burning sensation and prolonged numbness extending from lower lip to buccal mucosa upto retromolar area of right side of lower jaw. She also complained of difficulty in eating food.

She reported the department very next day and on examination extra orally no contributory findings could be appreciated while on intraoral examination necrosis of soft tissue extending from angle of the mouth to right side of mucosa overlying #44 to #48 could be seen (Fig 1,2). It was suspected that this damage cropped up due to accidental hypochlorite spillage in the overlying area.

Hence, a diagnosis of chemical burn due to hypochlorite spillage was made.

Fig 1: Clinical presentation of spillage of sodium hypochlorite

Fig 2: Erythematous angle of the mouth

Fig 3: 1 week after active treatment

Management

Patient was first counselled to stay calm and was explained that the lesion is self-healing in nature. She was advised to cold compress it intermittently in every 20 minutes for at least 24 hrs. Antibiotics was prescribed for three days. A steroid based gel and an antiseptic gel was also recommended. An analgesic (Dologel) for local application was suggested if experienced pain and instructed not to consume hot and spicy food until lesion heals completely. Patient was then kept on regular follow up.

The first recall was scheduled after one week (Fig 3) and changes could be appreciated but complete resolution was not done. The patient was then recalled after 20 days and on clinical examination full recovery and epithelization of the lesion could be appreciated.

So, it becomes at most important to isolate the operative field with rubber dam in order to avoid fatal complications.

DISCUSSION

Inadvertent spillage of NaOCl causes huge damage to vital tissues as it has an excellent tissue dissolving capacity which leads to tissue necrosis.[8]

There is infrequent literature reporting of NaOCl run over the canal beyond apical foramen. Complication in such teeth occurs if the foramina is too wide or if apical constriction has been destroyed during mechanical preparation. Additionally, excessive pressure while irrigating also results in dispersal of greater volume of irrigant in the apical tissues.

Diagnosis of NaOCl accidents can be made by Hulsmann's criteria including:

1. Acute pain, swelling and redness
2. Bruising
3. Progressive swelling involving infraorbital area or angle of mouth depending on site of NaOCl injection
4. Profuse haemorrhage often manifesting intraorally from orifice of the tooth
5. Numbness or weakness of facial nerve
6. Secondary infection, sinusitis and cellulitis[8]

In the above case patient developed typical presentation of NaOCl with acute pain, swelling, paraesthesia, bruising up to the angle of mouth.

Majority of cases with such symptoms resolve completely in few weeks[19] but few cases have marked long term paraesthesia or scarring.[9]

Best outcome is achieved by proper management of the case. Though no recognized guidelines for such treatment have been specified yet. The main aim of the treatment is eradication of the solution from the tissue and prevention of any secondary damage with conservative regulation.

Usually pain, edema, and erythema are initial signs of such mishaps. Early recognition of such signs and symptoms along with time plays an integral role in reducing destructive effect of NaOCl. Sometimes edema reported secondary to initial response could be life threatening and can lead to airway obstruction.[10]Risk of such accidents can be minimized by passive ultrasonic irrigation.[11]

Treatment in such accidents should rely on contracting critical signs and symptoms as well as stave off secondary infections. Immediately after acknowledgment of such act procedure needs to be terminated and tissue damage can be prevented by irrigating with normal saline, tissue contact with hypochlorite should be reduced.

For pain alleviation local and oral analgesics are helpful. In cases of severe edema, can be relieved by external cold compression on affected area for 5 min and repeated after every 20 minutes. After 24 hrs cold compression can be replaced by hot fomentation for revival of blood supply to the affected area.

Antibiotics could be prescribed to prevent any secondary infection and during life threatening complications surgical intervention may be necessary.[12]

Hypochlorite could be treacherous for dentist too, they should protect their eyes and clothes from its corrosive action, rubber dam should be used to prevent leakage/ contact of solution to the soft tissue.[13]

Other measures for prevention are:Passive irrigation i.e., irrigating needle 1-3 mm short of working length, also permits free needle movement within the canal. Irrigate by using low and constant pressurewhile injecting the solution. Side vented needle (Lok Luer needle) with side delivery port can be helpful in intercepting damage induced by NaOCl

CONCLUSION

Sodium hypochlorite is important in root canal treatment as a disinfecting irrigation fluid. Accidents occur with sodium hypochlorite use, but are rare. Consequently, the optimal way to avoid such accidents is to adopt the above-mentioned precautions. Should an accident happen, this protocol comprising immediate intervention with patient follow-up will allow reversal of unfavourable reactions and successful resolution of therapy.

So, the present case report draws special attention towards probable risks kindred with the use of caustic irrigating agents like sodium hypochlorite. Thus, effective preventive measures should be taken to escape any fatal consequences. While thereupon such accidental mishaps appropriate treatment guideline to be followed.

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