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# Negligence In Dental Clinic – Formalin Injected Accidentally Into The Buccal Vestibule - A Case Report.

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**Abstract**

Health profession including dentistry is considered to be a noble profession but mistakes do happen in every profession. The dental negligence can lead to serious complications and can cause threat to one's life.

Transparent clear solutions such as hydrogen peroxide, alcohol, sodium hypochlorite, formaldehyde and local anesthesia are widely used in dentistry, so the soft tissue is liable to accidental injury. Formalin, a 37% -40% solution of formaldehyde is extensively used in 10% solution as a tissue preservative, but it has toxic effects on system such as GI tract, repiratory tract, skin and mucosa.

Total 8 cases of accidental injection of formalin have been reported in the literature till date. This case report describes the accidental local infiltration of formalin while performing biopsy procedure for lichen planus. Patient complained of severe pain and burning sensation at the site of infiltration followed by necrosis and slough formation. Patient was kept under medication and recalled after seven days. Necrotic tissue was removed surgically. Follow-up visit of patient showed normally looking buccal mucosa without scar formation.

KEY WORDS: local anesthesia, Formalin, accidental injection, buccal vestibule, Necrosis

## Introduction

Dentistry is one of the noble profession in the health profession. Any mistakes are tend to happen accidentally and are inevitable in any profession. Negligence by a dentist or doctor can cause many hazardous complications. These complications at times may end up as life threatening to the patient.[1]dental negligence can be of various forms, One such complication is accidental injection of formalin instead of a local anesthetic solution by a dentist. The primary component of formalin is formaldehyde. Formalin is available as 10 p.c. neutral buffered formalin.[2] Formalin is used as disinfectant, antiseptic and as tissue preservative and fixative which is 37-40% standard aqueous solution of formaldehyde. It is a toxic substance which mainly affects respiratory tract, GIT, skin and mucosa. There are various forms of formalin toxicity like exposure to formalin vapours, skin contact, accidental ingestion or injection of formalin.[3]

Many cases are reported on systemic ingestion of formalin but 9 cases have been reported on accidental local ingestion of formalin till date, the recent one being

reported in 2017. All such reported are cases mostly associated with major nerve block injection such as inferior alveolar nerve, posterior superior nerve, infraorbital nerve, with one being in buccal mucosa. The present article reports accidental injection of formalin in buccal vestibule near 3rd molar area

**Case Report**

A 27 old male reported to a private hospital with lesion on the left buccal vestibule. On examination there was white lesion in the lower left buccal vestibule. Patient was advised for excisional biopsy for the same (fig 1). Detailed case history was taken, patient was healthy and without any history of systemic disease. Local infiltration of anesthesia around the lesion was planned.

As a routine, the practitioner's assistant was asked to load local anesthesia in syringe. By mistake, the assistant loaded formalin solution which was preserved in recently emptied botte into disposable syringe, thinking it to be local anesthesia. Such formalin filled bottles are commonly used by Indian practitioners to preserve extracted teeth for academic purposes and also to collect biopsy specimens. The patient was administered formalin in buccal vestibule by practitioner who mistook it as local anesthetic agent.

The patient complained immediately of severe burning pain on the injected side which was thought to be an allergic reaction but it was noticed that wrong vial has been used for injection. 5ml normal saline was injected as the same time to dilute the concentration of formalin, followed by IV Avil (45mg), IM dexamethasone 8mg, IV cefixime 1g, IM diclofenac 75mg and IV ranitidine 50mg twice a day and kept under observation for 48 hrs.

The following medications were prescribed later for oral administration: 1. Amoxicillin 500mg BD, metronidazole 400mg TD, analgesics and chlorhexidine mouth wash for 1 week.

Patient was recalled to hospital after seven days, there was formation of necrotic tissue at the site of injection measuring almost 1 x 1 cm in size (Fig 2). Patient was planned for removal of necrotic tissue. The necrotized tissue was excised and area was sutured (Fig 3). Mucosal wound healing was complete and without scar formation 15 days after the procedure (fig 4).

**Discussion**

Iatrogenic errors during clinical procedures are considered to be problem of epidemic nature. Damage resulting due to exposure of such substances that are toxic can be grouped as 1. Unintentional general, 2. Environmental, 3. Occupational, 4. Therapeutic error, 5. Unintentional misuse, 6. Bite/ sting, 7. Food poisoning. 8. Suspected suicidal, 10. Intentional misuse.

Oral mucosal damage due to chemicals can occur during use of such materials due to procedural errors in dentistry and are under unintentional general and therapeutic errors.[4]

Instead of proper precautions, accidents happen in health profession as in dentistry. Formalin is generally used in dentistry for preservation of specimens and the main reason for formalin accidents are because it is commonly placed in emptied local anesthesia bottles for collecting specimen.[1]

In our case local infiltration of formalin was done accidentally because of which there was acute inflammation at the site of injection followed by necrosis and ulceration. The accidental injection of formalin in our case was due to storage of formalin in the same empty local anesthetic bottle.[5,6]

All the cases reported for accidental injection of formalin in the oral cavity are from India, due to the frequent use of empty local anaesthetic vials for preserving and transferring biopsy specimens instead of separately

labelled biopsy bottles in academic settings which is one of the major factor responsible for such incidents.[2]

Our study is in accordance with S.C. Sarode et al, Dandriyal et al, Bector et al, Arakeri et al, Saujanya et al, Swami et al and Gupta et al. where in treatment plan followed was almost the same which involved initially injecting dexamethasone at the site of injection to reduce the inflammation, followed by prophylactic treatment with broad spectrum antibiotics, analgesics, steroids, debridement of necrotic tissue.

Dandriyal et al, Bector et al and Saujanya et al reported cases of accidental formalin injection for the inferior nerve block, Arakeri et al reported for posterior superior alveolar nerve block, Swami et al reported accidental formalin injection into mental nerve, and Gupta et al reported for infraorbital nerve block and S.C. Sarode et al. for accidental injection in buccal mucosa. In our case accidental local infiltration of formalin was given into the buccal vestibule for the biopsy procedure of lichen planus.

In many of the reported cases, symptomatic treatment was given to reduce the ill effects of formalin injection

**Conclusion**

Although no laid down guidelines exist about management of injection of formalin, good results are achieved with surgical intervention and excision of necrotic tissue.

The most common cause for such type of unfortunate accidents is due to using old local anesthetic bottles for storing such chemicals without labelling.

Extreme care and precautions should be taken while handling clear solutions such as formalin, alcohol, acrylic monomer, $H_2$ $O_2$, sodium hypochlorite and local anesthesia which are frequently used in dental office. It is highly recommend to store these solutions in properly labelled containers and away from operatory area.

Apart from these an advice is suggested to avoid mishandling of such soluti0ns.

1. Prevention is better than cure (trying to use LA cartridge)
2. Safety is best way to stay away from comlications (use labelled vials with aluminium sealed vials)
3. There should be a one predefined area for all labelled bottle to be kept.

**Few guides are also recommended to avoid such accidents[6]**

1. All staff working in a dental office need a thorough introduction and education to dental drugs and chemicals.
2. Local anesthesia bottles must never be reused with existing labels.
3. All consumables should have a bottle preferably different from the bottle of local anesthesia and if used must be clearly labelled.
4. All chemicals not for injection must be physically removed from clinical areas.
5. Untrained or illiterate assistants should not be allowed to handle injectable drugs.

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**Legends Figure**

Fig 1: Lesional area where formalin was injected

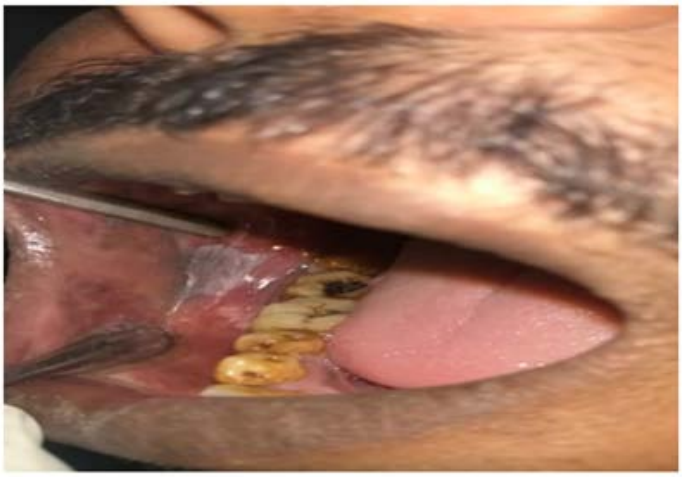

Fig 2: Necrosed area was removed surgically

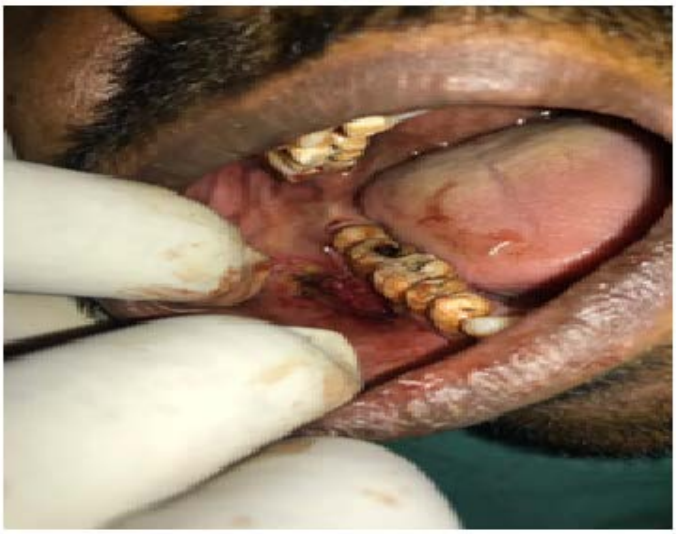

Fig 3: suturing was done

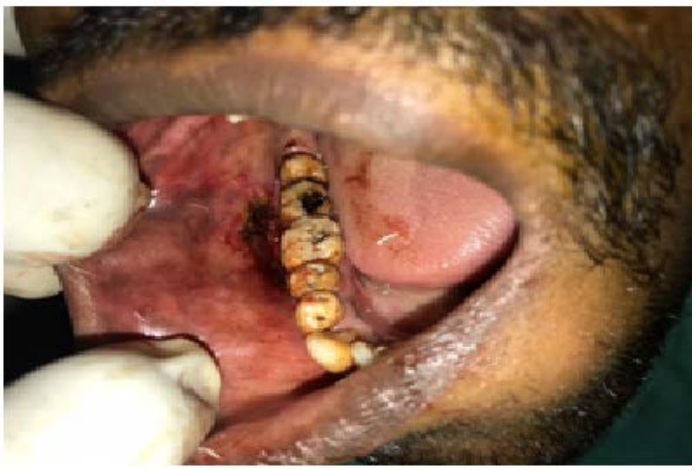

Fig 4: Lesion healed without any scar formation