Unintended Formalin Injection instead of Local Anesthetic Agent: Its Causes & Management

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ABSTRACT

Mistakes do happen in every profession instead of proper precautions. Mishaps are those unfortunate accidents that occur during treatment, some owing to inattention to detail, others being very unpredictable and some are due to the negligence of the employee. Dental negligence may lead to severe complications and may threaten one's life. This case report presents an unconventional case of administering formalin in lieu of local anesthesia in a dental clinic leading to chemical cellulitis and its management.

Keywords: Dental negligence, formalin, Hypersensitivity, Local anesthetics

INTRODUCTION

Dental negligence is an avoidable injury caused by a dentist who does not take proper care of the patient.[1] In every occupation, mishaps occur. Unfortunately, mistakes in the healthcare profession could have serious consequences for the patient and a big trouble for the doctor. In dentistry there are many colorless solutions like sodium hypochlorite, normal saline, local anaesthesia, hydrogen peroxide and formalin used for various purposes. All of them require special storage and handling. Formalin is a forty per cent, aqueous solution of formaldehyde.[2] It is a colorless, neutral, volatile liquid with a pungent odor and slightly irritating taste. It is used as a disinfectant, antiseptic and tissue preservative in dentistry.[3] It is a toxic substance that needs careful handling and special processing and induces first-degree and second-degree burns when applied to the skin and mucosa. It has also deleterious effect on the digestive and respiratory systems.[4] It can also be lethal at a dosage of 50-100 ml at a concentration of 40%.[5] This case report describes an unusual case of chemical facial cellulitis caused by unintentional injection of formalin instead of local anesthetic into infraorbital space during infraorbital block.

CASE REPORT

A 25 yrs old male patient presented to the dental department with the chief complaint of severe pain and burning sensation in his right and left cheek. Intra- oral examination revealed a red and blackish lesion on the right and left buccal mucosa in the region of premolar. An extra-oral swelling was also evident, which appeared normal in color but was warm and tender on palpation (fig-1,2). During elicitation of detailed history from the patient, it was assumed that local dental practitioner has injected the local anesthesia for giving infraorbital block in relation to teeth nos.15 and 25 in order to attempt for extraction, as the patient had grossly decayed above mention teeth. Fortunately, he had injected very less quantity. Patient attendant gave us the bottle from which the local anesthesia was given. Considering that this was a hypersensitivity reaction, skin pinch test (fig-3)
(SPT) was performed using the same solution with his signed permission. The results of the SPT were read after 15 minutes and were positive. But after observing the patient's symptoms and clinical condition, the solution of the syringe was checked, the pungent smell came out, so it was confirmed that clear liquid was formalin. By fault, the local practitioner might had loaded the formalin solution (2 mL), which had been placed in an untagged emptied bottle of local anesthesia, into the disposable syringe, assuming it was the local anesthetic agent. Usually, these cases require debridement and surgical intervention, but as the damage was less in the present case, it was decided to manage conservatively.
The patient was immediately administered dexamethasone (4 mg) intramuscularly to reduce inflammation. Saline was injected to dilute the formalin at the injection site. Then patient was admitted. The extra-oral warm swelling with erythema was noted to increase progressively for the first 24 h. The patient had severe pain with an increasing burning sensation. The patient was kept under strict supervision and monitor. Medications prescribed included injection intramuscular dexamethasone 8 mg twice a day (tapering doses: 8 mg once a day for 2 days and 4 mg once a day for 2 days), Intramuscular Diclofenac sodium twice for 5 days to reduce pain, Intravenous Amoxicillin + Clavulanate 1.2 gm to reduce the chance of aerobic infection, Intravenous Metrogyl 100ml thrice for 5 days prophylactically given to counteract anaerobic infection, Intravenous Ranitidine 2cc for 5 days to prevent gastric upset, patient was adviced to use Betadine mouthwash to prevent oral infection. After 48 h of observation, the patient was discharged against medical advice. A follow-up appointment was scheduled. We examined the patient at a weekly interval. By the 2 weeks, swelling had completely regressed, patient had no complaint

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How to cite this article: Padma Chandra, Rajesh Prasad. Unintended formalin injection instead of local anesthetic agent: its causes & management. International Journal of Contemporary Medical Research 2020;7(3):C1-C2.

DOI: http://dx.doi.org/10.21276/ijcmr.2020.7.3.26

Figure-1: Extraoral Photograph on 1st day.

Figure-2: Extraoral Photograph after 24 hour

Figure-3: Skin prick test.

Figure-4: Extraoral Photograph after 15 days

of any pain or irritation and there was no evidence of necrosis in that area (fig 4).

DISCUSSION

Doctor and patient have a relationship of trust and faith. But mistakes occur in every profession, as it does in life. Unfortunately, mistakes in the healthcare profession could have serious consequences for the patient and, in turn, could lead to responsibilities for the doctor / dentist. For clinical dentistry, local anesthetics are commonly used. Many clear solutions are also used for different purposes like: sodium hypochlorite, normal saline, local anesthesia, hydrogen peroxide and formalin in dentistry. All of them need special storage and handling.[6] In this case report mistake happened because of negligence and use of untagged multiuse vial containing clear liquid formalin. In dentistry formalin are basically used for preserving extracted teeth (use for educational purpose) and to collect biopsy specimen. It should not be placed near surgical operating area. So to avoid such complication, we must follow some instruction such as:

1. All chemicals not used for injection must not be there in clinical area as they create confusion.
2. An undesirable trend of reuse of local anesthetic containers for storing chemicals. If we reuse the vial at all, the content should be well tagged. We should not use multiuse vials, use single use cartridges.
3. Qualified assistants are scarce in India and most dental practitioners are forced to seek help from local assistants who are not qualified or experienced in the handling of dental drugs / chemicals.

Lack of knowledge and awareness of the drugs that leads to this unfortunate event. All employees working in a dental office need a detailed introduction and education of dental drugs and chemicals, because a small mistake made by assistant can cause a great deal of trouble. We should not hire untrained and/or illiterate dental assistants.[7]

CONCLUSION

Health profession like dentistry is a very sensitive profession, only one single wrong step can lead to death of the patient. Mishap do happen due to the negligence, so every dentist should have sufficient knowledge of precautions and management regarding handling of dental drugs and chemicals to avoid such complication and health of the patient. Care must be taken to avoid an accident.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 27-01-2020; **Accepted:** 28-02-2020; **Published:** 20-03-2020