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Case Report

Burn Injury- A Rare Mishap of Endodontic Treatment: A Case Report - 8

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ABSTRACT

Endodontic treatment is a routinely carried out dental procedure for the management of pulpal and periapical diseases. Complications and mishaps may occur during endodontic treatment and they can be access related, instrumentation related, or obturation related. The purpose of this article is to report a rare and unusual case of burn injury during endodontic treatment in dental practice. The case report describes the effects of inappropriate handling of ethanol in a clinical practice. The use of ethanol requires special precaution and where possible, especially in dental practice, the use of alternative safe technology should be adopted.

Keywords: Endodontic treatment; Burn injury; Mishap

INTRODUCTION

Endodontics encompasses the study and practice of the basic and clinical sciences of the biology of the normal dental pulp and the aetiology, diagnosis, prevention, and treatment of diseases and injuries of the dental pulp along with associated periradicular conditions [1].

During endodontic treatment complications and mishaps may occur, and a number of these complications have been reported [2,3]. Such unfortunate accidents that happen during treatment might be due to lack of attention to details, or might be totally unpredictable and are thus known as procedural mishaps or procedural accidents [4].

There are several examples reported in the literature that cite and document disabling complications/mishaps related to endodontic treatment. Endodontic mishaps can either be access related, instrumentation related, obturation related, and/ or miscellaneous [5]. These may include tissue damage, neurological deficit [2,6], localized bone infection [7,8], swallowing or inhaling of instruments [9], bacteremia [10,11], maxillary sinus infection [12,13] and many more. The purpose of this article is to report a rare and unusual case of burn injury in endodontic practice that has not been reported in any literature to date and to discuss possible measures that may be adopted to prevent such a mishap.

CASE REPORT

A 46 year old businesswoman, presented at our referral hospital with a complaint of sustaining burn injuries to the face, neck and the right hand during dental treatment. Upon arrival, the patient was accompanied by the dentist who was treating her, thus the history of the incidence was narrated by both the dentist and the patient. The attending dentist had an undergraduate degree with three years of experience.

Earlier on the same day, the patient had reported to one of the dental clinics in the city with a complaint of severe toothache on the right lower first molar that was diagnosed as acute irreversible pulpitis. Endodontic treatment was planned and initiated, and during obturation with Gutta-Percha (GP), a mishap occurred.

Whilst condensing the GP, the dentist instructed the assistant to add methylated spirit into the gallipot so as to keep the flame burning. A dental assistant inappropriately added fuel to an open-flame burner which was approximately two feet from the patient, and this resulted into a small explosion which knocked the burner onto the patient. The patient was burnt on her face, neck, and upper right arm while the dentist was not burnt. The tooth which was undergoing treatment was thus filled with zinc oxide eugenol prior to referring the patient to our hospital.

Upon arrival at our hospital, on examination, the patient had a fresh burn wound on her right cheek, right lateral neck, and on the upper right arm. The diagnosis of second degree burn injury covering 9% of total body surface area was made. The patient was admitted into the burn unit where she received parenteral antibiotics, analgesics, and Intravenous (I.V) fluids; with daily wound care. She recovered within two weeks and was therefore discharged from the wards with minimum esthetic impairment.

After being advised to get the endodontic treatment of the tooth completed before discharge, the patient requested the treatment to be deferred to a later date. It is not known whether afterward the patient did get it treated or not due to loss of follow up.

DISCUSSION

Endodontic treatment like any other dental procedure has a variable degree of inherent risks. The complications/mishaps which may arise during the treatment can be related to the clinician, patient or the instruments. Several studies have reported mishaps/ complications arising during endodontic treatment [2-6,10,12], but our literature search found none reporting about burn injuries. Apart from field of dentistry, fire accidents related to addition of ethanol to a burning flame have been documented in other settings [14,15].

The standard of care requires that the clinician avoids unreasonable risks that may harm the patient. Treatment is deemed negligent when a reasonably careful clinician fails to foresee and prevent unreasonable risk of harm to the patient as it has been reported in this case. It was the negligence by the clinical staff that led to the mishap.

In general, mishaps can be attributed to a number of facts including, poor communication between staff, technology failures, and practitioner's lack of experience or technical competence. Others include judgment and/or interpretation error, excessive workload and patient-related factors.

In the case reported here, the assistant made poor judgment and also had failed to foresee the outcome of the choice of adding more fuel to a burning flame. The dentist may be held responsible because had sole responsibility of supervising the subordinates in all the aspects of clinical work. During the procedure when the assistant was adding fuel to an open flame the dentist took no action to stop that.

Alcohol is a flammable chemical, hence any alcohol containing product is guaranteed to burn provided the alcohol content is high enough. Methylated spirit is constituted by 95% ethanol ($\text{CH}_3\text{CH}_2\text{OH}$) popularly known as ethyl alcohol [16], but methanol is also added so as to discourage recreational consumption, since it is poisonous [17]. Being a highly flammable liquid, the dentist and the staff should have observed necessary measures to handle the methylated spirit. The flame should have been completely put off prior to adding more methylated spirit into the gallipot.



The observation of the authors has found that most of the dentists in their regions use open fire to heat instruments used for cutting the gutta percha. Ideally, the cutting of gutta percha should be done using safer methods including alcohol lamp, alcohol torch or blow torch and preferably, using non-flame heating method like electric gutta percha cutter. This report deems to emphasize the dentist of the potential hazards accompanying endodontic treatment and that open flame with methylated spirit solution should preferably not be used at all.

CONCLUSION AND RECOMMENDATION

The science of dental treatment has made tremendous progress in recent times with advanced management options available for almost all dental ailments. Reducing the number of treatment errors and iatrogenic complications should be the solitary aim. The clinical staff should be keen with their daily practice, and should have ambition of updating their knowledge on regular basis.

In view of the findings of this case, recommendation is made that methylated spirit should be placed into appropriate containers (e.g. alcohol lamps and wick lamps) if it is to be used for heating purposes. Where possible the dentists should adopt use of electric gutta percha cutter while doing endodontic treatment.

DECLARATION OF PATIENT CONSENT

The authors certify that they had obtained patient consent. The patient gave her consent for the clinical information to be reported in the journal but with the condition that none of her pictures be used in any form. Thus, the patient understands that neither her names nor her photos/pictures shall be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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