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CASE STUDY

Iatrogenic soft tissue injuries during restorative treatment: A report of two cases based on review of literature

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ABSTRACT

Preparing the dental hard tissues and using restorative materials are common practices in restorative dentistry. Because of the kinds of equipment utilized, an unexpected accident could occur at any point during a normal dental office procedure with a bur and a high-speed drill are two tools used in basic dental procedures. This article reports two cases where soft tissue injuries, a tongue laceration and another case with injury to the floor has taken place. Corrective measure in such case has also been discussed. The purpose of the case report is to increase the awareness among general dental practitioner's regarding these unavertable injuries and take necessary precautions also briefly discuss regarding prevention that may be necessary to undertake.

Keywords: *Iatrogenic, Tongue Laceration, Floor of mouth injury, Damage, Dentistry, Restorative Treatment*

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INTRODUCTION

"Iatrogenic" is derived from the Greek word "iatros," which means "doctor or healer." "Gennan" translates to "as a result." "Harm, damage, or impairment that results from the activities of a doctor" is a broad definition of iatrogenic injury. Iatrogenic harm may come from the therapist's actions or inactions, or it may be the consequence of an unintentional or incorrect therapy [1].

Any trauma caused by a dentist's activity, manner, or treatment is referred to as an iatrogenic injury.

Dental iatrogenic therapy may result in damage to the soft tissues, the tooth, or both [2]. Any dental procedure at any stage has the potential to become iatrogenic.

The risk of collateral damage to other oral and facial tissues is always there, especially when working on supine patients. The nature of the dental tissues and the materials used for restoring them necessitate the use of strong instruments that must operate in close proximity to vulnerable soft tissues, in addition to the oral environment being a confined area with limited access [2]. There is a possibility that dentist or the dental team might also be injured.

Therefore, it is critical to remind ourselves of the potential for challenges, what might go wrong, and what each member of the dental team can do to help prevent unintentional injury. The majority of unintentional injuries can be avoided with constant attention from the entire dental team, caution in everyday clinical procedures, and avoiding complacency [2].

Here we present two cases where a lacerated injury to a ventral surface of the tongue had taken place during a restorative treatment and another case where a polishing bur had injured a floor of the mouth.

Therefore, in order for any dental therapy to be successful, dental professionals must become more aware of the impact that iatrogenic variables play. The purpose of the case report is to increase the awareness among general dental practitioner's regarding these unavertable injuries and take necessary precautions also briefly discuss regarding prevention that may be necessary to undertake.

Case reports:

Case report 1:

Fig 1: The floor of the mouth in relation to the left side of the lingual frenum got entangled in the bur and caused mucosal laceration. **Fig 2**: Suturing was done with vicyrl 3-ooo, a simple thre interrupted sutures were placed.

A young adult female patient aged 32 years reported to the intern clinic at college of dentistry with chief complaint of multiple carious teeth in relation to permanent natural dentition. The patients personal, medical,social and relevant drug history did not reveal any significant parameter that would have altered the course of the dental treatment.

Restorations were made in the concerned teeth with bulk fill composites which require finishing and polishing after placement, curing and sealing. While removing the excess cured composite from the restoration in relation to mandibular left second premolar with a tapering flat end air rotor bur, the patient moved the tongue while raising the floor of the mouth due to water that was collecting in the oral cavity. The floor of the mouth in relation to the left side of the lingual frenum got entangled in the bur and caused mucosal laceration inducing heavy bleeding in the region. After applying a pressure pack to stop bleeding, it was noticed that a breach in the mucosa extending in different directions had occurred. After the bleeding was stopped suturing was done with vicyrl 3-ooo, a simple thre interrupted sutures were placed.

Case report 2:

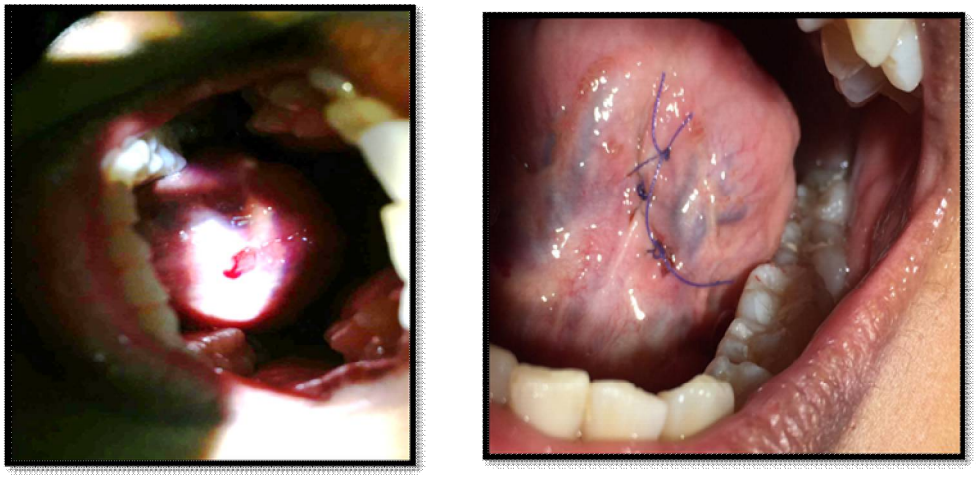

Fig 3: Deep laceration on the ventral surface of the tongue towards left of lingual frenum approximately 2 cms by 1 cm in size. **Fig 4**: a simple thre interrupted sutures were placed.

A 36-year-old female patient reported to the intern clinic with chief complaint of poor oral hygiene along with badly decayed posterior mandibular teeth. Patient's treatment related history did not reveal any significant parameter that would alter planning of current treatment. Patient had to undergo multiple class 1 and class 2 restorations with direct filling bulk fill composite in relation to mandibular left teeth. In one of the molars, while removing the excess and finishing of the restoration using a finishing disc, the patient involuntary raised tongue and floor of mouth causing a deep laceration on the ventral surface of the tongue towards left of lingual frenum. The laceration was approximately 2 cms by 1 cm in size. Once the bleeding was stopped, suturing was done with vicyrl 3-ooo, a simple thre interrupted sutures were placed.

DISCUSSION

One major problem that dentists and surgeons may encounter both before and after restoration treatments is iatrogenic injury in the preparation and maintenance of restorative teeth. Furthermore, prior research has shown that during class II and traditional full-crown preparations, neighboring injury is unavoidable [3-5]. The following categories apply to the types of injuries that may arise. Burns, Chemical or caustic burns, "Crush" injuries caused by lacerations, injury to the spine, Mechanical injuries and other injuries. For the purposes of this review: we will briefly injuries caused by the rotatory burs in this paper [6].

When placed in a small space, like the mouth, powerful devices that rotate quickly are unavoidably dangerous. The most frequent injuries that occur during cavity or crown preparation are to the lip, tongue, cheek, and floor of the mouth [7]. As seen in our case report (Fig: 1 & 2). These injuries when they occur may cause severe complications like bleeding which needs urgent care with controlling of bleeding with sutures (Fig: 3, 4).

Both cutting and polishing discs have the potential to seriously harm a patient's tongue, lip, and oral cavity floor. A disk guard should be employed whenever feasible. During minor oral surgery or other operations, sharp instruments may slip and cause additional laceration injuries to the gingiva, cheek, palate, and floor of the mouth, among other intra-oral tissues[7, 8]. Additionally, there may be soft tissue damage, which could cause the patient to experience uncomfortable things. During restoration, the tongue and cheeks may be affected. Damage to the cheeks and lips may occur during the preparation of the buccal and labial surfaces [7, 8].

Furthermore, damage to the tongue can be readily observed when the mandibular molars and lingual surfaces are prepared. use of a mouth mirror, ejecting the flanged saliva, carefully retracting, and employing the aspirator tip can all help lower the risk of tongue damage during restoration treatments[7]. It is advised to prepare the mandibular molars carefully in order to prevent complications and to prevent the patient's tongue from enduring any harm [7, 8].

Burs have a fast rotational speed, which can cause them to be displaced from the handpiece head and lose their position in the oro-pharynx or soft tissues. Numerous cases of bur displacement into surrounding tissues, including the maxillary sinus[9], medial orbital [10] wall as well as ingestion [11] have been documented in the literature. Numerous reports about the latter scenario, particularly involving pediatric patients, can be found in the literature [12-15]. By making sure the bur is completely placed into the handpiece, the operator can avoid this regrettable and perhaps disastrous situation [16]. A bur with a longer shank should be chosen over one that is partially removed from the handpiece housing if it becomes clear that the bur cannot reach the preparation spot [16].

Liston [17] reported two cases of trauma to the buccal soft tissues caused by displaced polishing discs. In the first case under local anesthesia, a restoration put in in the buccal aspect of an upper left second molar was polished as part of routine conservative care. The composite polishing disc detached from the mandrel during the process, lacerated the buccal mucosa, and vanished. Then removal the disc was done under general anaesthesia which was lying in the tissues above the apices of the maxillary left second molar [17].

Another case reported by Liston [17] reducing the cusps on the opposing upper right second molar with a sandpaper disc on a friction grip, square mandrel. Unfortunately, when the disc contacted the tooth, the patient abruptly closed her mouth. The disc was displaced from the mandrel, lacerated the buccal mucosa and disappeared from view. Under general anaesthesia later that day the wound was explored, the disc removed.

Not only the patient, even the dental personal can get injured, Hailu K [18] reported an unexpected accident that took place in a routine practice of a dental clinic with a high speed drill diamond but that flare off and injured his chin with a small bleeding laceration. Later the dentist realized that broken piece of the bur was lodged in the soft tissue of his chin, in the vestibule of the mandibular anterior, which was

confirmed by OPG and later removed. Matoo KA [19]. Reported a case where lack of knowledge by a dental student produced subacute injury to the periodontium by the high-speed hand speed (air rotary) with diamond point (long tapering fissure).

Discs, burs, and scalers are examples of devices that rotate quickly and could injure people. When placed in a small space, like the mouth, powerful devices that rotate quickly are unavoidably dangerous. Devastating injuries can result from discs and burs. When these sharp tools inadvertently slip during minor oral surgery or other operations, it might result in additional laceration injuries to different intra-oral tissues [2].

Contributing factors:

It has been shown that a variety of circumstances may increase the risk of iatrogenic harm during repair. Nonetheless, it seems that the primary determinants are associated with the performing surgeons and their track record of successfully completing treatments [7, 8]. Another factors we is hardly discussed according to the authors are hurry and stress of the operator or the dentist undergoing stress burn-out syndrome.

The following are the common four complicating factors responsible for the injuries:

- Reduced visibility and limited access
- Local Anesthetic effects:
- Wearing gloves
- Patients who are nervous

Reduced visibility and limited access:

Reduced visibility and limited access by the Dentist, assisting dental nurse, or both increase the likelihood of many of these accidents. In order to maximize patient protection, effective communication between the parties can enable treatments to be stopped and any necessary positional adjustments to be performed.

Many of the injuries mentioned above can be prevented by using rubber dams, but on a few occasions, a hot tool used in conjunction with endodontic procedures performed beneath rubber dams has resulted in an invisible burn injury to the patient's tongue that is directly beneath the rubber dam's surface. Unforeseen to the operator, an improperly fitted rubber dam has also been reported to permit materials and solutions to pass through to the exposed gingival tissues below.

Local Anesthetic effects:

Many of these injuries go unnoticed by the patient once local anesthesia has been administered and their mouth has been anesthetized. Because the dentist is not informed of the damage until it is too late, this might make the issue worse.

Wearing gloves

Dentists and dental personnel including dental nurses all wear dental gloves to protect themselves from heat injuries. Until the damage is done, the operator is unaware of the problem at hand. For instance, it is usually necessary to let hot instruments cool down before using them after they have just been taken out of an autoclave.

Patients who are nervous

Any procedure that involves the possibility of unintentional harm should be performed with the understanding and preparedness that patients, especially young patients and anxious patients, may move unexpectedly and without notice. Whenever feasible, there should be enough safety precautions and protective equipment in place to enable the process to be terminated without endangering the patient.

Prevention:

High-speed airotar damage to the tongue is a frequent result of negligent crown preparation on the lingual surface of mandibular teeth. With the various slots in the mouth prop, this tongue guard can be adjusted. Because the mouth prop comes in a variety of sizes, it's a particularly practical tool in these situations. Alternately the assistant can also use a mouth mirror-shaped suction to retract the tongue.

Dentistry with close support:

Using high-speed rotating equipment has a significant risk of harming other soft tissues in the mouth. The risk of soft tissue damage will be reduced with the assistance of a qualified dental nurse who is adept at retraction of soft tissues, such as the tongue and cheek. Using rubber dams will further lessen the possibility of this kind of harm.

The dental nurse can contribute significantly to the prevention of injuries like the ones mentioned above by bringing an additional dimension to risk awareness and control in the surgical setting through the use of a team approach to risk management.

As usual, the dentist and other staff members may much contribute to the prompt and cordial resolution of issues of this kind by responding with empathy, compassion, and support. The key to managing unintentional dental care injuries is demonstrating concern, which may include a follow-up phone call

and review appointment. Every stage of the aftercare and follow-up procedure should be painstakingly documented in the patient's records.

CONCLUSION

A majority of restorative dentistry procedures, including the preparation of the tooth hard tissues and restorative materials, use rotary instruments, which consists of burs and a handpiece operating at high speed. When working clinically, careful selection and use of the right burs will maximize results while lowering the risk of problems and iatrogenic injury. A trained dental nurse who is skilled at retraction of soft tissues, like the tongue and cheek, will help lower the chance of soft tissue harm. This type of damage can be further reduced by using rubber dams.

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