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Orthodontic Emergency Administration / Management: A Review

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Abstract--The aim of this review article is to understand management of any emergency arising to the orthodontic patients during treatment and also management during corona virus pandemic. Although there is no actual emergency, only few cases require immediate attention. Different commonly occurring problems are discussed along with analysis of different management methods. Any emergency relating to dental problems can also be evaluated using a social networking site (WhatsApp) or instructions given verbally as a mode of contacting patients and evaluating their issues especially during covid-19 scenario.

Keywords---appliances, patient discomfort, relief wax, treatment.

Introduction

Any unscheduled appointment to treat a problem arising during the course of orthodontic treatment can be defined as an orthodontic emergency. According to the American College of Emergency Physicians (ACEP), an “emergency” can be defined as any condition perceived by the prudent layperson, or someone on his or her behalf, as requiring immediate medical or surgical evaluation and treatment. Management is a set of principles relating to the functions of planning, organizing, directing and controlling, and the application of these principles in harnessing physical, financial, human, and informational resources efficiently and effectively to achieve organizational goals. To maintain the belief of patient on operator and treatment effective management is needed. During these covid 19 pandemic years it becomes even more important to wisely/timely manage the

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emergencies. The management of an emergency is done either by general dental practitioner (GDP) or using a professional orthodontist's guidance by the patient himself or if unmanageable by scheduling a additional visit to an orthodontist. According to association of Dental Education in Europe (ADEE) dental graduates should be able to manage most of these problems. Always reassure patient that these problems are temporary. So, the aim of this review article is to find out management of different emergencies in orthodontic office. The objectives of this review was to assess confidence in management at different levels and to evaluate measures used during these covid 19 times.

Classification of different situations

Different problems can be classified based on appliance used that can be removable or fixed

Removable appliances

Removable appliances can be classified into the following:

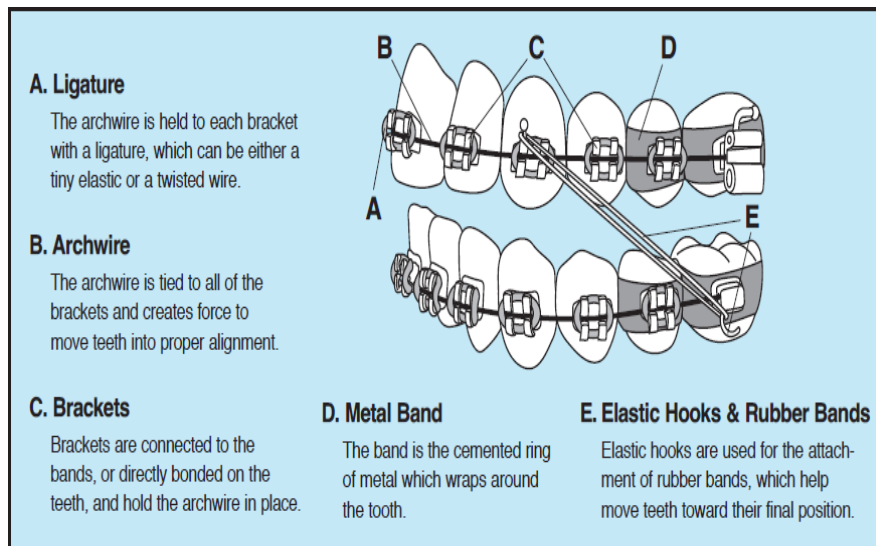
- Functional
- Aligners
- Retainers (ex. hawleys, begs, Essix appliance)¹

Functional appliances are growth modulating appliances to achieve better relation of jaws and dentoalveolar complex. Any breakage of such appliance has noticeable discomfort for further continuation of treatment. It was suggested to momentarily suspend wearing such appliances. Any discomfort or broken retainer should not be further continued with advice of using last/previous set that fits well. An aligner or a retainer appliance can be often broken or lost by the patient. For aligner treatment, the advice would be to remain on the current aligner if the patient does not have any more until the end of the emergency. If there are no problems with the current aligner and subsequent aligners are in the patient's possession, the suggestion is to continue with the subsequent aligner, up to the treatment phase prior to IPR, replacement of attachments, and introduction of elastic modules.

In the event that the current aligner is broken or lost, the advice would be to go on the previous aligner or to change to the next one depending on the percentage of usage of the broken/lost aligner. As for the retainers or if there is a high risk of recurrence that irreversibly compromises the treatment, we suggest to buy an easy contentive appliance, like hot customizable preforms, which can be found on ecommerce sites such as Amazon, which currently still allows fast shipments, so when the emergency will be finished, the clinician can take new impressions or scans.¹

Fixed appliances

The pre adjusted edgewise appliance is the commonly used appliance that usually includes brackets, archwires and different auxiliaries.



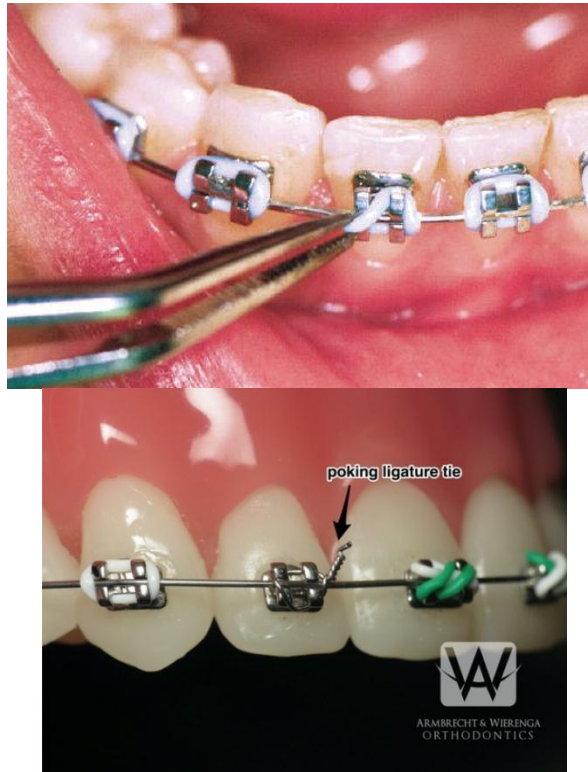
Food caught between teeth

The common but not very serious problem is food lodgement, it's a matter of embarrassment to the wearer. This can be managed using dental floss with small knot in center, interproximal brush or using toothpick.



Ligatures come off

Fine dead soft wires or tiny rubber rings usually holds the wire to the bracket. Wire ligature ties should be removed whereas rubber bands may be placed back safely using sterile tweezers. When these wire ligatures hurt the lip its better to bent back them using pencil erasers. Every time missing or broken ligatures should be be given adequate attention.



Discomfort

A normal occurrence is pain /discomfort following adjustment of braces or retainers. This situation is uncomfortable. Reassurance should be given that this problem is temporary and patient shall eat soft food along with warm saline rinses. During the immense pain complaint affecting eating and sleeping, analgesic drug prescription are a common protocol.



Mouth sores

Irritation caused by braces might exacerbate or precipitate mouth sores. Ulceration may appear on cheeks, lips or tongue. This may be very uncomfortable. Relief can be achieved by using topical anesthetic (such as Orabase or Ora-Gel) directly to the ulcerated surface using a cotton swab. Use of relief wax is also prescribed.

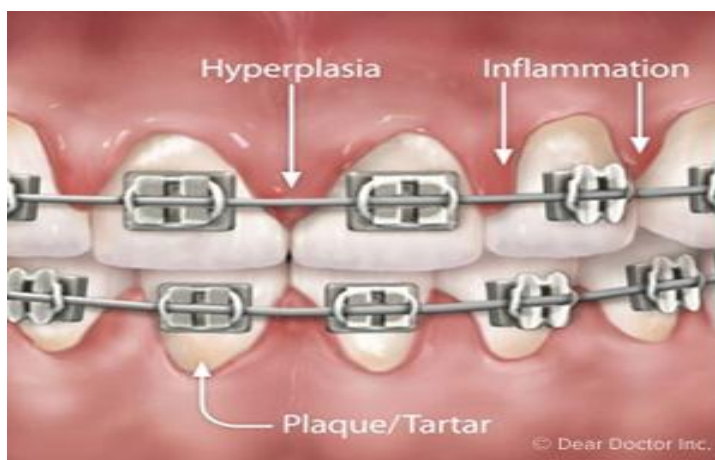


Irritation of Lips or cheeks

Patient might feel irritation with braces especially during eating. A small amount of non-medicinal relief wax can be used as a buffer between metal and mouth. Pinch a small piece, roll it and press it over area of irritation. The wax used if ingested is harmless.

**Bleeding Gums**

Another common problem after the initial bracket placement is of bleeding gums. These can be associated with gingivitis or periodontitis which may happen due to maintenance of poor oral hygiene leading to increased debris and plaque accumulation. strict oral hygiene maintenance with brushing, flossing and usage of mouthrinses should be stressed on the patient before, during as well as after the braces placement. take a complete medical history prior to orthodontic treatment to rule out any medical problems associated with bleeding gums.



Lost Spacer or Separator

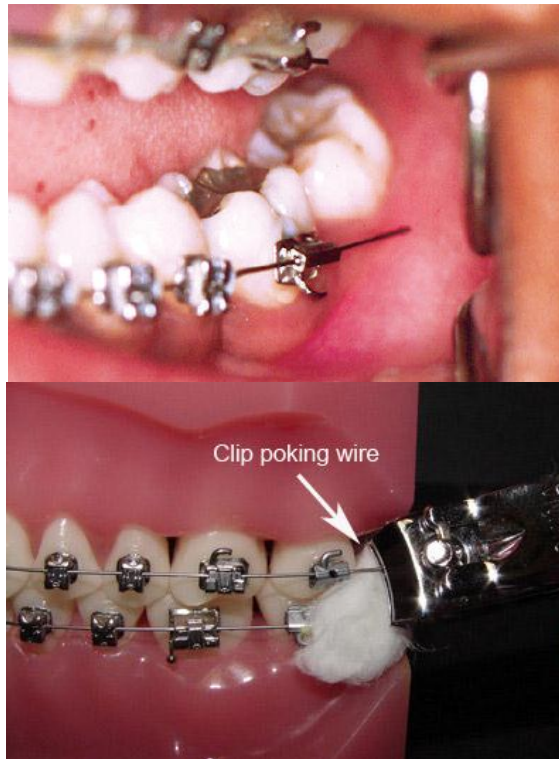
Separator is important to ensure a proper band placement. A lost spacer or separator can lead to delay in the banding process which in turn delays the entire orthodontic treatment. If the patient reports of a lost separator it is ideal to make an appointment and place the separators again.



Protruding Wire

Commonly the one end of wire work itself out of its slot and start irritating buccal mucosa or cause ulcerations and soreness of mouth on that side. One of the common reason is improper trimming of archwire distally after placement. The patient should try to push it back with eraser or back of pencil, if unable to do so then use relief wax. These type of wax is easily available on pharmacies or order it online. Food wax can also be used in emergency cases. Eyebrow tweezers can help repositioning the wire. The parent\guardian must inform the orthodontist in case wire is bothering too much. The best option is to cut the wire. The patient can cut it using nail clippers at home also, in case of thick wires order hard wire cutter on e-commerce sites. All nickel-titanium wires must be cinched back.

Possibility of swallowing snipped part of wire should be avoided using gauge or folded tissue wrapped around the concerned area.



Loose Brackets, Wires or Bands

Brackets, handles to deliver force to teeth were attached with special adhesives to teeth. These attachments generally become loose after lacking on some of the precautions given by orthodontist usually seen in young teenagers. This must be informed to the orthodontist to take adequate steps. These brackets if remains flush with tooth, it is to be left as such or secured to teeth using relief wax. If the bracket falls off then it can be carefully removed using eyebrow tweezers by patient himself/herself.



Piece of appliance is swallowed

This is a rare situation. Most common part of the appliance swallowed has reported to be the molar bands, buccal tubes, elastics, separators and expansion key. Naragond et al advises to check the efficiency of the appliance to withstand occlusal forces before delivering the appliance to the patient. In case some part of appliance got ingested, it can be fairly alarming but keep the patient calm under such situations. In case patient is coughing excessively or having difficult breathing chances of aspiration are there. When piece is visible, you may remove it carefully. Non invasive procedures such as Heimlich maneuver, CPR, abdominal thrusts and laxatives can be utilized as the emergency procedure to removed the ingested foreign body till help arrives. However it is ideal to visit a physician as soon as possible in these cases.



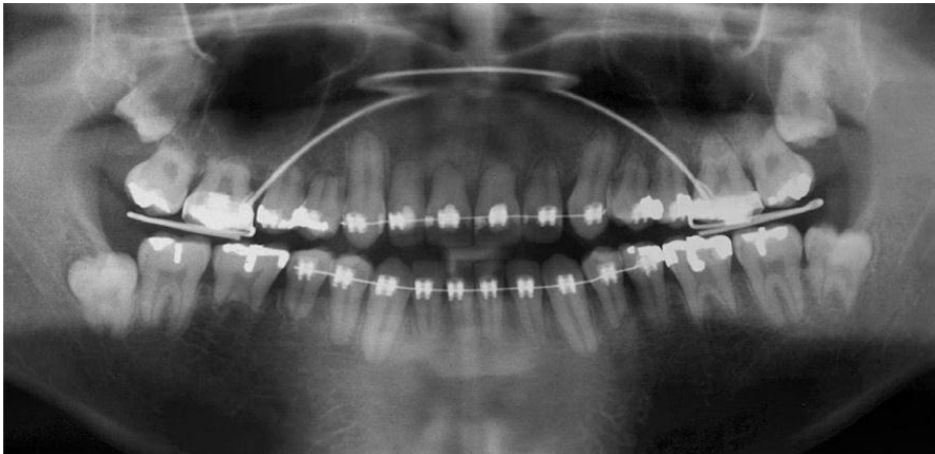
tooth Mobility

During orthodontic treatment a small amount of tooth mobility is considered normal consequence in the biology of tooth movement. However care must be taken to locate the exact cause of the problem. In case of excessive mobility further damage to teeth due to occlusal trauma must be restricted. A temporary bite plane or cap splint should be advised for these patients. The tooth mobility would be reduced Within few weeks. Meanwhile soft diet is advised during the treatment and avoid any hard or sticky foods.



Root Resorption

There is insignificant root resorption in most orthodontic cases with excessive force excessive mobility was reported. orthopantomogram (OPG) determine exact extent of resorption depending on severity of resorption treatment should be further progressed.



Lost or Broken Retainers

Lost or broken retainers are common problem in orthodontist office. Awareness and importance of retainer wear should be implemented prior to the start of treatment. Some patients feel that once the treatment is over the teeth will stay in their position, however that is not the case. Although some patients report to the orthodontist to replace the retainer, many patients feel that it is not necessary. Face masks, headgears, or lip bumpers type of non -removable appliances and elastics might cause buccal or palatal mucosa injury due to breakage then further treatment should be suspended to reduce any risk of injury till patient visits again the orthodontist. Pre-activated appliances, such as Pendulum, Forsus, the pre activated appliances like Distal Jet appliance ,and transpalatal bar should be

discontinued in case of emergency or pain. The buccal or palatal mucosa got injured severely by this breakage. If a periodontal abscess is suspected, then it is suggested to visit him to remove the cause, for example, a band under the gum, and then to treat the infection with antibiotic therapy. If the patient feels pain, redness, and swelling near a fixed orthodontic appliance, we can ask him/her to take a photo and send it to the dentist: if a periodontal abscess is suspected, then it is suggested to visit him to remove the cause, for example, a band under the gum, and then to treat the infection with antibiotic therapy. Whether this is not immediately possible, we recommend prescribing a symptomatic therapy with FANS or paracetamol after properly asking for allergies

Table 1
How to resolve orthodontic emergency scenario

Removable appliances	Functional	If it is broken or does not fit, send photos to the orthodontist and suspend the use	
	Aligners	Remain on the current/go on with treatment following clinician's indications/if broken or lost get back to the previous and ask the clinician	
	Retainers	If broken or lost, ask to the dentist to evaluate buying hot customizable preforms on e-commerce sites	
Fixed appliances	Non-removable appliances (e.g., straightwire appliance)	Loose bracket	Send a photo to the dentist, eventually remove it with tweezers
		Poking distal wire	Send a photo to the dentist, use wax, eventually cut with disinfected nail clipper/hardware cutter
		Poking ligature	Send a photo to the dentist, use wax, eventually push it back with eraser of a pencil
		Periodontal abscess around molar band	Send a photo to the dentist, symptomatic therapy with FANS/paracetamol, eventually prescription of antibiotic
	Non-removable	Must be suspended a priori to avoid	

	appliances activated by the patient (e.g., face masks, headgears or lip bumpers, palatal expanders)	future emergencies
	Pre-activated, non-removable appliances (e.g., Pendulum, Forsus, Distal Jet appliance, transpalatal bar)	Take a picture every 20–40 days; if the patient feels pain or swelling, see as an emergency in the dental office and eventually remove the appliance

Discussion

Emergencies can occur in any fields of dentistry, the knowledge of handling them should be known to all practitioners. Orthodontic emergencies though not frequent but they do occur. This article reviews the most common orthodontic emergencies that can occur and how to handle these emergencies by patient or a general dental practitioners. Murray et al in 2015 stated the importance of handling orthodontic emergencies by general dental practitioners. He stressed that discomfort and pain of the patient is reduced if proper diagnosis and management of orthodontic emergencies are carried out, leading to appropriate treatment outcomes. Another online survey by Popat et al in 2016 where he concluded that general dental practitioners were able to confidently handle 10 most common orthodontic emergencies without any difficulty. Sodipo et al in 2017 stated the importance of general dental practitioners to have sufficient knowledge in giving orthodontic 'first aid' during emergency. Kandi et al in 2016 reported the management of foreign body ingestion during dental practise and the role of dental practitioners in managing these emergencies. Milton et al reported three cases of accidental ingestion of foreign bodies associated with orthodontic treatment and the role of GDP's in handling these situations.

The Findings Noted Were / Conclusions

The patient shall be instructed properly prior to start of treatment verbally, manually to manage problems at home using watts app, photographs or videos. Discomfort caused by patient operated appliance must be discontinued for some time until patient visits an orthodontist again. During covid 19 times the WhatsApp Messenger (Facebook Inc., Mountain View, California) was an instant and effective messaging application used among users of all ages¹. If the patient feels pain, redness, and swelling near a fixed orthodontic appliance, we can ask him/her to take a photo and send it to the dentist: if a periodontal abscess is suspected, then it is suggested to visit him to remove the cause, for example, a band under the gum, and then to treat the infection with antibiotic therapy. Whether this is not immediately possible, we recommend prescribing a symptomatic therapy with FANS or paracetamol after properly asking for allergies

In A survey on 72 Vocational Dental Practitioner's (VDPs) conducted at Cardiff University in their first year of employment found that 60% of individuals were not confident in managing an orthodontic patient (Jones). It was concluded that majority of students felt confident in management of problems. Overall, the majority of dental students felt confident in managing orthodontic emergencies. A supported learning environment and exposure to a range of clinical problems expanding clinical experience made students feel more confident. Maximising learning opportunities for students in this area needs appropriate integration of theory and practice and standardized clinical exposure to common orthodontic emergencies and a supportive learning environment.

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