

Displacement of Root Tip into the Bucal Mucosa – Complication during Therapeutic Extraction – A Case Report

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ABSTRACT

Exodontia is one of the most common minor surgical procedures carried out by the general dental practitioners in their daily clinical practice due to various etiologies. Encountering an unforeseen complication during any routine dental office procedure cannot be underestimated. Amongst various common and uncommon complications discussed in the literature, accidental displacement of teeth or roots into the anatomical spaces during extraction is one amidst them. In this article we report a case of an accidental displacement of a root tip into the adjacent buccal mucosa during a therapeutic orthodontic extraction of the right maxillary first premolar.

Key words: Exodontia, Complications, Displacement, Orthodontic extraction.

Introduction

In the era of modern dentistry, teeth can be maintained as long as possible for functional and aesthetic motives. However it becomes certain at times to extract teeth owing to a variety of reasons like dental caries, pulpo-periodontal lesions, and pathologic lesions around the tooth, before radiation therapy, fractures of the crown and root, teeth in line of fracture, malposed, impacted and supernumerary tooth, and therapeutic extractions for orthodontic, prosthodontic and other reasons.¹

An ideal tooth extraction is the painless removal of the whole tooth or tooth-root, with minimal trauma to the investing tissues so that the wound heals uneventfully with minimal postoperative complications. Extraction of tooth basically involves three main principles.²

1) Expansion of bony socket, 2) Lever of first order and 3) Wedging principle.

Delivering a tooth out of the socket involves a thorough understanding of the tooth anatomy, root morphology, the investing soft tissues and proper knowledge about extraction techniques prior to extraction. Extraction of tooth principally falls under two categories,

1) Closed or Forceps or Intra Alveolar Extraction.
2) Open or Surgical or Trans Alveolar Extraction.

A careful preoperative assessment is mandatory to assess difficulties during extraction and minimize complications, which includes a detailed clinical history, procuring and interpreting a proper preoperative radiograph, a definitive treatment plan, and the choice of anaesthesia. Despite these necessary precautions encountering complications becomes inevitable.

Complications though unexpected, increases the morbidity of the procedure, increases the procedure time making it burdensome for the patient and the dental practitioner. Though it is absolutely challenging to cease its occurrence it is imperious for the clinician to be aware of the complications and should be readily available to manage, if any or refer them to counterparts who are

competent enough to manage them.

Complications accompanying dental extraction can range as listed below:²

- Inadequate anaesthesia,
- Postoperative pain and swelling
- Trismus
- Trauma to the adjacent hard and soft tissues
- Hematoma, and haemorrhage
- Infection
- Wound dehiscence
- Failure to remove the tooth or root
- Fractures of the crown, root, alveolar bone, tuberosity, and mandible.
- Displacement of the tooth or root into adjacent soft tissues, anatomic structures, (maxillary antrum, pterygopalatine fossa),
- Oro-antral communication
- Systemic complications

Case Report

A 20 year old female patient reported to the Department of Oral and Maxillofacial Surgery for therapeutic extraction of the maxillary right first premolar. After proper preoperative assessment, anaesthesia was achieved buccally by field block and palatally by infiltration using 2% lignocaine with 1:80,000 adrenaline. After proper evaluation of adequate anaesthesia, mucoperiosteal flap was raised and tooth was luxated using a dental forceps. Tooth extracted was examined and the apical tip of the buccal root was found to be fractured and was observed for the same in the extraction socket. The fractured tooth is shown in picture (fig.1).

Retrieving the fractured root tip was attempted using periosteal elevator, reamers, and apexo elevators which was not successful. After few attempts, upon palpation the buccal socket was found to be empty. With proper clinical evaluation and assessment the root tip was finally palpated at the mucogingival junction in relation to the apex of the tooth extracted.

Patient was informed about the root displacement and was reassured for recovery of the root tip.

The root was palpated and a stab incision was given 5mm above the muogingival junction and the root tip was delivered through the soft tissue with the haemostat (fig.2, 3). The retrieved part was checked and was confirmed for total extraction of the tooth and root completely out of socket (fig.4, 5). Suture was placed in the incision region with 3-0 vicryl. Post-operative instructions given and medications were prescribed. Patient was called for follow up with uneventful recovery and satisfactory healing.

Discussion

Though proper controlled force is applied, fracture of the tooth or root while performing dental extractions can be attributed to the variations in tooth and root morphology, bony anatomy, operator's experience, and patient's age, and gender associated factors.⁵ Retained root fragments in clinical practice necessitates key decision in attempting the removal of these fractured roots which is dependent on the risk benefit ratio for an individual patient.⁴

Maxillary molars and premolars are most commonly fractured tooth during extractions and are most likely to be found during routine radiographic examination. Intra-operative fracture of these tooth are likely due to its curved root morphology, and thin and multiple roots. Excessive force or improper technique or faulty usage of instruments is the most common cause for iatrogenic displacements of root or tooth into anatomical spaces.³

The architecture of the maxilla features a trabecular pattern that is more vulnerable to fractures and depicts non-pathological perforations, which are not rare anatomical variations, so there is a risk of displacement into adjacent anatomical sites.³ The buccinator muscle originates from the alveolar process of the maxilla and inserts inferiorly on the alveolar process of the mandible and posteriorly onto the anterior border of the pterygo-mandibular ligament. The attachment of muscles determines the movement of the displaced tooth into anatomical spaces. The displacement of the root tip can be attributed to the existing fenestration in the maxillary alveolar wall and below the attachment of buccinator muscle exiting through the vestibular space.



Fig.1



Fig.2



Fig.3



Fig.4



Fig.5

Studies have concluded that roots with vital pulp tissue healed effectively with cementum formation over the fractured dentinal surface when excluded from oral fluids.⁴ In consideration to orthodontic extractions retained root tips might deter orthodontic tooth movement, which dictates tooth removal with minimal damage to the buccal and palatal cortical plates. There is no evidence in literature⁴ as to quantify the size of the root that can be left behind.

It mandates necessarily to precisely localize the fragment with the aid of radiographs (panoramic or occlusal or CT). Nerve injury or displacement to deeper tissues or damage to the buccal artery or minor salivary glands must be taken into consideration during retrieval procedures. In our case immediate retrieval of root tip was done and a thorough clinical examination and palpation aided to localize the displaced fragment under the mucosa. A stab incision was placed and the root tip was retrieved with a haemostat.

Conclusion

To conclude, exodontia practise may have complications varying from simple to severe ones. During extraction, it is imperative to pay attention to details, protect the soft and hard tissues, and appropriate force to be delivered with caution while using dental forceps and elevators. The clinician must possess the clinical insight to recognize imminent complications and should keep in mind the dictum *"to do no harm"* to serve effectively to the patients and render healthcare at its best as professionals.

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