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CASE STUDY

PERIO-ORTHO INTERACTIONS: MANAGEMENT OF IMPACTED MAXILLARY INCISORS

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ABSTRACT

Maxillary permanent incisor impaction is not a very common finding in the dental practice. This causes its management to be challenging to the orthodontist. Various etiologies can be attributed to causing this condition. Timely diagnosis and early management is the key correction of this condition. The aim of this case report is to review the guidelines for management of impacted maxillary incisor and present a case of the same.

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INTRODUCTION

Maxillary incisors are the most visible teeth with maximum display and hence play an important role in patient's esthetic outlook. They also play an equally important role in the phonetics of a person (Huber *et al*., 2008). Absence of the maxillary incisors leads to an unaesthetic appearance which affects the self-esteem of the patient and impairs his social interaction. Impacted maxillary incisors aren't a very common finding as third molars or canines and are found to occur in only 0.2-1% of the population (Kurol, 2002). The functional problems developing due to this condition and the skeletal relationship can be improved by early diagnosis and timely management (Cozza *et al*., 2004). Often the diagnosis and treatment planning requires an interdisciplinary approach. Periodontist and orthodontist need to work as a team to contribute to the proper diagnosis and the treatment, consisting of surgical exposure and eruption techniques, for the impacted tooth.

ETIOLOGY OF IMPACTED MAXILLARY INCISORS

Pathologies such as supernumerary teeth, odontomas, and cysts can lead to an eruption failure.

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The most common cause being the presence of supernumerary teeth (Smailiene *et al*., 2006). Dilacerations or tooth malformations can also cause a failure in the eruption of the maxillary incisors. Trauma to the primary tooth can lead to dilacerations where the developing tooth bud is damaged. Another reason for impaction is mucosal barrier in the path of eruption due to early extraction or loss of deciduous teeth. Non-vital or ankylosed primary teeth (Betts and Camilleri, 1999), ectopic position of the tooth bud (Becker, 1998), and endocrine and bone disorders can also cause this condition.

GUIDELINES FOR MANAGEMENT OF IMPACTED MAXILLARY INCISORS

To formulate an appropriate treatment plan, it is important to accurately diagnose the condition clinically and radiographically (Duncan *et al*., 1983).The patient's complete history, medical and dental history, should be recorded to exclude local or systemic diseases (Huber *et al*., 2008). The type, degree and direction of the trauma inflicted should be recorded and maintained for proper treatment planning (Huber *et al*., 2008; Brin *et al*., 1982). During the clinical examination, it is important to check for the following signs (Becker, 1998; Duncan *et al*., 1983; Kavadia-Tsatala, 2004):

- Over retention of the corresponding primary teeth
- Reduction in available space for eruption of the permanent tooth

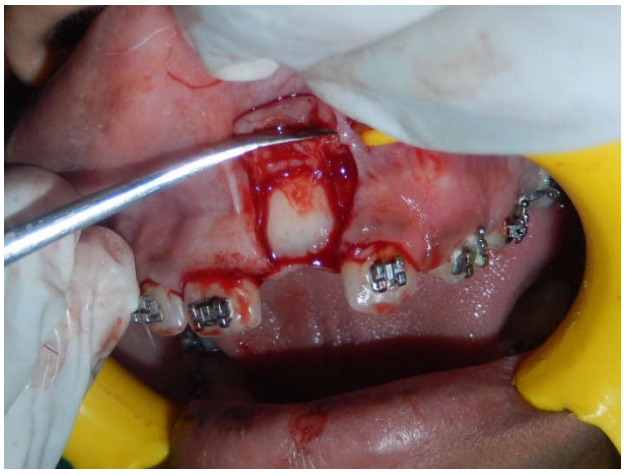
- Inclination and rotation of the adjacent teeth
- Absence of a bulge in the buccal sulcus area at 1-1.5 years before the expected time of tooth eruption.
- After confirmation with palpation, the labial or the palatal mucosa around the tooth location is elevated
- A deviation from normal sequence of eruption.

The following are examined during radiographic examination (Chaushu *et al*., 2004):

- The root apex and crown position of the impacted tooth.
- Impacted tooth's and the adjacent teeth's root proximities.
- Presence of odontomes, supernumerary teeth, cysts or any other pathology.
- Presence of adverse conditions like root resorption of adjacent teeth.
- The anatomy of the crown and the root in three dimensions.

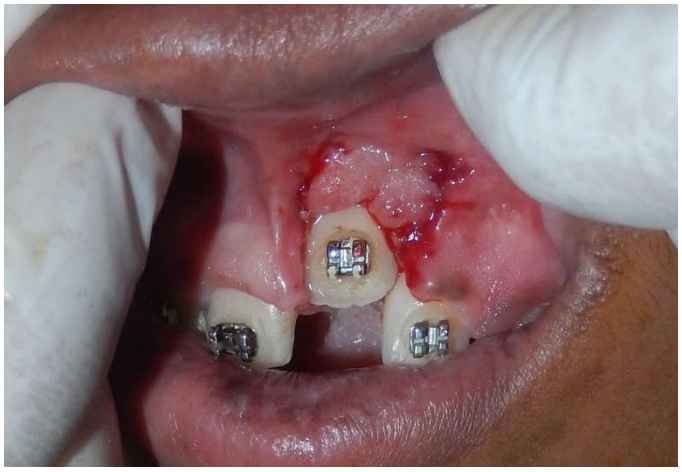
An interceptive treatment planning should be done which surgically removes the obstacles, and followed by creating space for delayed tooth to erupt. When the root of the permanent tooth is still developing, there may be a chance that the tooth may erupt normally (Witsenberg and Boering, 1981). But with a completely formed root apex of an impacted tooth, surgical exposure and orthodontic extrusion is necessary. It is imperative to maintain the keratinized gingiva, and surgical exposure techniques must be decided accordingly to create sufficient keratinized tissue around the final position of the erupted tooth.

Case Picture 1. Preoperative View



Case Picture 2. Flap elevation to expose impacted 21

Case Picture 3. Flap sutured apically and bracket placed



Case Picture 4. Postoperative view after one week

Case Picture 5. Postoperative view after six months

The procedures for surgical exposure include (Prato *et al*., 2000; Prato *et al*., 2000):

- Simple gingivectomy (window approach)
- Apically positioned flap
- Double pedicle graft
- Free gingival grafts

When the tooth is impacted at midalveolar, palatal or intraosseously, a closed eruption technique (Vermette *et al*.,

1994) or a tunnel traction technique (Crescim *et al*., 1994) can be used. The tunnel traction technique uses the presence of the primary tooth. An osseous tunnel is created by extracting the overlying deciduous tooth. This tunnel is extended by drilling up to the cusp of the impacted tooth, where a bracket or button is placed. An eruption path is allowed by the traction that leads to the orthodontic movement of the impacted tooth towards the centre of the alveolar ridge (Crescim *et al*., 1994).

Case Report

A 12 year old male patient was referred for exposure of 21. Examination revealed that the patient had a class II malocclusion with impacted 21. An apically displaced flap technique was advised keeping in mind the final position of the impacted tooth. Impacted 21 was exposed following incisions and flap elevation, and flap was sutured after positioning it apically. A bracket was placed on the labial surface of the tooth. Orthodontic force activation was done following suture removal and healing of tissues around the tooth. In the 6 month post- treatment review, the impacted tooth was found to be having sufficient amount of attached gingival and was in level with the adjacent teeth.

Conclusion

A case of delayed eruption should be diagnosed on basis of clinical and radiographic examination. Radiographs are important for proper diagnosis and treatment planning.

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