

Guidance of Eruption - Myth or Reality? A Case Report

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Abstract

The altered path of eruption causing the resorption of the permanent lateral incisor root after the ectopic eruption of the permanent canines is a common complication which is detected radiographically. The relationship of the permanent canines with the lateral incisor suggests that lateral incisor acts as guidance for the eruption of the permanent canines. The case presented here is a 9-year-old boy with permanent dentition showing the resorption of the roots of the lateral incisor due to the eruption of the permanent canines taking the lateral incisors as the guidance. This article aims at establishing that early detection and prompt preventive measures will lead to avoiding the critical complications arising out of the erupting canines and will preserve the morphological and functional integrity of the lateral incisors and the dentition.

Key words: Canines, Eruption, Incisors resorption, Ugly duckling

INTRODUCTION

The goal of “guidance of eruption” is to avoid the need for active orthodontic treatment or to reduce it to the minimal. A strong dependence between impacted canines the contact with their adjacent teeth and the root resorption of the incisors.¹⁻³ The frequency of root resorption of the lateral incisors is 12.5%. The treatment of impacted canines is complex and prolonged.

Ericson and Kuroi^{2,4} assume that the resorption of the lateral incisors after the ectopic eruption of the permanent canines is the most common complication and may be detected in all cases of considerably altered route of the canine eruption. It is most commonly seen in the lateral incisors-in 38%, and less frequently in the central incisors - in 9% of the cases. The apical and median third of the root are most commonly affected - in about 65%.^{4,6}

Thanks to computerized axial tomography, nowadays, we can detect even minimal resorption fields on the incisor roots and establish that in almost 50% of the cases with impacted canines.

Ericson and Kuroi^{2,4} group the severity of resorption of the lateral incisor in 4°:

- No resorption - intact surface
- Slight resorption - up to the middle of the depth of the root dentin
- Moderate resorption - affects more than half of the depth of the root dentin
- Severe resorption - reaches the root pulp.

Root resorption is a physiological event for the primary teeth and it is said to be regulated by the stellate reticulum and the dental follicle of the underlying permanent tooth via the secretion of the stimulatory molecules, i.e., cytokines and transcription factors. The primary root resorption process is regulated in a manner similar to bone remodeling, involving the same receptor ligand system known as (receptor activator of a nuclear factor [RANK]-kappa B/RANK ligand).⁷ Primary teeth without a permanent successor eventually exfoliate as well, but our current understanding on the underlying mechanism is slim. The literature is also vague on how resorption of the

Access this article online



www.ijss-sn.com

Month of Submission : 05-2016

Month of Peer Review : 06-2016

Month of Acceptance : 07-2016

Month of Publishing : 07-2016

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pulp and periodontal ligament of the primary teeth occurs. Knowledge on the mechanisms involved in the physiologic root resorption process may enable us to delay or even inhibit exfoliation of primary teeth in those cases that the permanent successor teeth are not present, and thus, the preservation of the primary teeth is desirable.

CLINICAL CASE REPORT

The case presented involves a 9-year-old boy showing orthopantomogram (OPG) in mixed dentition period the upper left quadrant shows the erupting canines taking the guidance of lateral incisors root with the crown of the cuspids located at the apical 3rd of the lateral incisors. The central incisors and lateral incisors are flared depicting “Ugly duckling stage” (Figure 1).

The case was followed up after a period of 22-month and the OPG taken at this period presented with all permanent teeth and the roots of the lateral incisors completely resorbed, and the canine erupted into its final position with the crown located at and was neglected thinking it to be a physiologic process of eruption, but in the matter of just 22-months when the boy was 11-year-old the erupting permanent canine had totally resorbed the permanent lateral incisor (Figure 2).

DISCUSSION

The complications were seen due to resorption of the roots of the central and lateral incisors which are of considerable significance for the esthetic appearance and functional life of the dentition. The resorption as a complication may be foreseen, and measures can be taken for its prevention. Those are related to the provision of conditions for proper eruption of the canines. The inclination of the canine and the crossing the axis of the lateral incisor medially by the tip of the canine crown indicate canine impaction. By extracting the deciduous canine and ensuring space for the canine in the dental arch, the probability of canine eruption will be increased while the probability of the occurrence of complications related to the resorption of the adjacent teeth will be reduced.

The severity of lateral incisor root resorption cannot be accurately judged from two-dimensional (2D) radiographs alone. 2D radiographs are easy to use and provide useful information, although these images fail to detect the exact localization of the canines or any potential root resorption, especially with early or mild root resorption. Moreover, cone-beam computed tomography (CBCT) has a smaller radiation dose compared to CT and



Figure 1: Flaring of incisors depicting ugly duckling stage



Figure 2: Complete resorption of permanent left lateral incisor

overcomes the limitations of conventional radiography. Therefore, CBCT is a useful method for diagnosing the position, inclination, distance from adjacent structures, complications of impacted canines, and detection of lateral incisors root resorption. Furthermore, this method may have a significant impact on diagnostic and therapeutic interventions.⁷

CONCLUSION

Timely detection in early mixed dentition and prompt preventive measures will lead to avoiding the severe complications due to impacted canines and preserving the morphological and functional integrity of the incisors. The loss of incisors seriously deteriorates the esthetic appearance and function which requires orthodontic and complex surgical-orthodontic treatment to repair the dental arch and occlusion. The early prevention will provide optimal esthetic appearance for the patient, preservation of the natural integrity of the dentition and will avoid a prolonged and expensive orthodontic treatment.

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How to cite this article: Sunil T, Gowda NC, Amitha HA, Kiran YC, Kavyashree BS. Guidance of Eruption - Myth or Reality? A Case Report. *Int J Sci Stud* 2016;4(4):256-258.

Source of Support: Nil, **Conflict of Interest:** None declared.