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Computed Tomography For Localization of Impacted Canine A Case Report

KEYWORDS: computed tomography, impacted canine, intra-oral periapical radiograph, occlusal radiograph.

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ABSTRACT *Localization of impacted canine is a crucial step in there management. Computed tomography is a new method for revealing the intricacies of impacted canine in all three planes. It has several advantages over the conventional techniques, which are used for localization of impacted canines. The computed tomographic image proved to be superior and more informative when compared to the conventional radiographic methods.*

Introduction

A prime requisite for orthodontist is an accurate diagnosis and treatment planning for correction of particular malocclusion.

In planning the surgical orthodontic repositioning of malpositioned canines, correct diagnosis requires not only their precise location, but also a thorough and accurate assessment of the relationships with not only adjacent anatomic structures, but also in particular the roots of the adjacent teeth.[1, 2] Several authors have suggested use of Computed Tomography (CT) in impacted canine cases because it provides accurate three dimensional assessment.[1, 3,4,5,6]

The conventional radiography provides inadequate information in this aspect.[3] The pitfalls of conventional radiography includes image distortion, image magnification, superimposition, lack of clarity, less resolution and difficulty in localization of impacted teeth.

Here we present case report of a patient in whom conventional radiography misdiagnosed the position of impacted canine and computed tomography helped us to correctly locate the impacted canines and also it has an edge over the other conventional techniques.

Case Report

A 13-year-old female patient reported to the orthodontic department with the chief complaint of retained upper left and right canine. She had a class I molar relationship, proclinated upper lateral incisors, mild crowding in lower arch. The permanent maxillary canines could not be palpated clinically labially and palatally.

Intra-oral periapical radiographs (IOPA) (Fig. 1 & 2) revealed bilaterally impacted maxillary canines. Occlusal view (Fig. 3) revealed the impacted canines to be present on palatal side. Orthopantomogram (OPG) (Fig. 4) revealed bilateral palatally impacted maxillary canines.

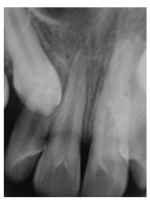

Fig. 1 IOPA of right side

Fig. 1 IOPA of left side

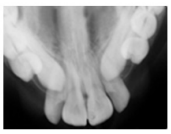

Fig. 3 Occlusal view

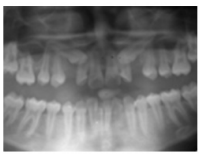

Fig. 4 OPG

Hence, surgical exposure from palatal aspect was decided on the basis of IOPA, occlusal radiograph and OPG for giving attachment to align the canine into the arch. After surgical exposure we found that the crown was not visible on palatal side. To confirm the exact position of impacted canines a decision of carrying out CT scan was taken. Informed consent was obtained from the patient. Fig. 5 shows axial view of a CT, which revealed that the impacted canines were present on labial side. Fig. 6 shows multiplaner reforming which revealed impacted canines obliquely placed and in close approximity with roots of lateral incisors. Fig.7 shows shaded surface display, which revealed impacted canines obliquely placed, the crowns of which were just overlapping the roots of lateral incisors.

Fig. 5 CT Axial view

Fig. 6 CT multiplaner Reforming

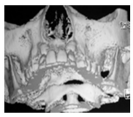

Fig. 7 Shaded surface display

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Result

In this case conventional radiography revealed impacted canines present on the palatal side but CT scan revealed impacted canines present on labial side. The CT images were obtained in all the three planes of space. These images showed exact position of impacted canine as well as approximity of impacted canine with root of lateral incisors. Axial CT, supplemented with multiplaner reforming & shaded surface display gave the exact buccolingual and cranio-caudal position of impacted canines.

Discussion

High radiation dose [7,8] & high cost are the two major drawbacks but the benefits of accurate diagnosis balances the drawbacks of using CT in revealing the intricacies of impacted tooth by providing a better foundation and prognosis for orthodontic treatment. It is a prerequisite in radiation protection that every radiographic exposure must be justified such that the management of the patient is likely to be altered or the prognosis changed. The dose implications to the patient are variable and obviously depend on number and thickness of cuts, the area irradiated and the kVp and mAs. The effective dose of CT per slice is 0.012 mSv [8] where as exposure to occlusal radiograph is 0.007 mSv. [9]

The added advantages like high resolution, an excellent clarity, a three dimensional visualization & no image distortion has increased the popularity of CT as the diagnostic procedure in the present era.

Conclusion

CT thus reveals the intricacies of impacted canines. Its use in the assessment of impacted teeth, like their angulations, any adverse curvature of the root and their effects on other teeth, such as root resorption has been significant. The occlusal and intraoral periapical radiograph misguided in the location of the impacted canines in this case but a small increase in exposure using computed tomography could be justified by the outcome.

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