

## Two Impacted Canines and a Transmigrated Canine-A Case Report

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### Abstract

Impaction and transmigration of canines are frequently clinical problem, which treatment usually requires an interdisciplinary approach. The probability of impaction or transmigration is low. This case report was three impacted canines in a 15-year-old male patient whose radiological examination show that the canines impaction. The current treatments for impaction and transmigration of canine remain different for the different developmental stages. Panoramic radiographs and the cone beam computed tomography could make early diagnosis of canine impaction, and then we could choose a suitable treatment method for patients to achieve a good clinical effect.

**Keywords:** Transmigration; Impacted canine; Cone beam computed tomography; Malocclusion

### Introduction

During canine eruption, insufficient eruption space, deciduous tooth retention and partial barriers could result in eruption obstruction, and the root adhesion, abnormal morphology, abnormal eruption direction could lead to abnormal canine eruption that are called impacted canine. The probability of occurrence of the maxillary impacted canine reached 0.9%-5%, only after the third molar<sup>[1]</sup>. The probability a mandibular impacted canine is 0.05%-0.4%<sup>[2]</sup>. Some previous studies have shown the risk being as high as 0.92-5.1%<sup>[1]</sup>. These differences in range could be caused by a different study population.

Transmigration occurs when the impacted canine moves through the midline of the jaw to the contralateral jaw. The probability of transmigration occurring is 0.1%-0.31%<sup>[1]</sup>, but some studies have shown that the probability ranging from 0.14%-0.31%<sup>[3]</sup>. The left mandibular canines more commonly experienced transmigration than the right. Females experienced transmigration more often than males (1.6:1)<sup>[4,5]</sup>. Unilateral migration has been shown to be more common than bilateral migration. Whereas bilateral migration of mandibular canines occurred simply because there is inadequate space to erupt<sup>[6]</sup>. The higher incidence of mandibular excursion is due to the greater cross region of the mandible. The absence of the upper jaw is a result of the distance between the anterior teeth and the base of the nasal bone being relatively close. The adjacent teeth root of maxillary sinus and the maxillary suture could cause the teeth to drift.

The Cone Beam Computed Tomography (CBCT) is a new diagnostic method widely used in all aspects of dentistry. The basic principle is that the conical ray beam after surrounding

the patient is received by flat panel detector, and then the data is reassembled in the computer to get the three-dimensional image. This study was conducted on a present case report of a mandibular canine transmigration and other two canines impacted in a 15-year-old male patient.

### Case report

A 15-year-old boy presented to our hospital for orthodontic treatment. The intraoral examination revealed over-retained tooth 63 without mobility and missing teeth 17, 27, 23, 33, 43. The patient had no history of prior extractions. Radiological examination showed that missing tooth 27 dental germ and impacted teeth 23, 33, 43. And the examination revealed intra bony longitudinal migration of tooth 33 to the periapical region of tooth 43 crossing the midline (figure 1a). CBCT examination showed that the crown of tooth 23 was positioned to the root of tooth 21 which was root resorption on sagittal image (figure 1b). The coronal view show that the crown of the transmigrated canine, the tooth 33, was situated below the apex of tooth 42, and the root of tooth

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33 was positioned below the apex of tooth 4 (figure 1c). Furthermore root resorption of the lower incisors, possibly owing to the presence of transmigrated canine, was excluded (figure 1c). This was type 1 transmigration pattern classified by Mupparapu<sup>[7]</sup>. Horizontal position scanning show that the tooth 43 which was between teeth 42 and 44 failed to eruption due to the insufficient space (figure 1d). The three-dimensional graph showed the situation of the teeth 23, 32, 33 more clearly (figure 1e).

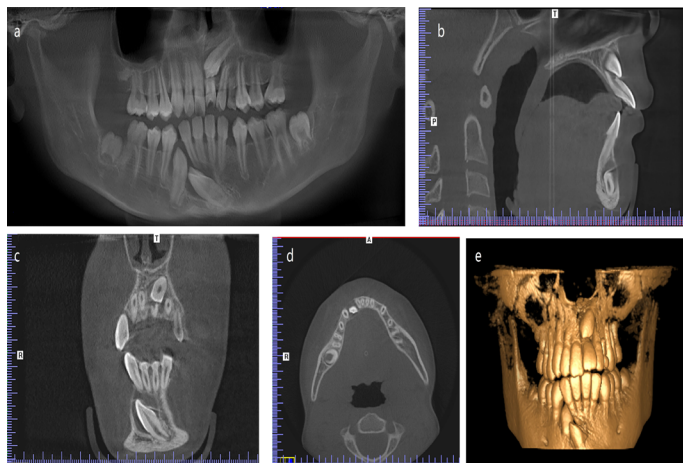


Fig 1a Panoramic radiograph demonstrates the transmigrating canine below the apices of mandibular incisors. b sagittal view of the canine in CBCT. c coronal sagittal view of the canine in CBCT. d Horizontal view of the canine in CBCT. e three-dimensional graph of the patient.

## Discussion

Impacted canines remain a challenge to the clinicians. The probability of this occurring is low. The etiology of impaction and transmigration remains unclear. There are a variety of factors that could result in impaction and transmigration. For example, the early loss of deciduous teeth, the retention of the canines, odontoma, a crowded malalignment, or an excessive mandibular crown can cause impaction or transmigration<sup>[1,6,7]</sup>. Patients with impacted canine or transmigration commonly have developmental abnormalities in the mandibular lateral incisors, second premolar abnormalities, enamel development defects, missing teeth, and impacted maxillary canine<sup>[4,7,8]</sup>.

The current treatment for impacted canine remains different for the different developmental stages. In the early developmental stage, the removal of deciduous teeth and the odontoma could prevent or limited canine impaction and transmigration. When canine impaction does occur, surgery could stretch the canine back to anormal position by orthodontic traction. The transplantation of the canine was only one possible treatment. When there was adequate space between the deciduous canines, the canine could be surgically moved into a normal position. This treatment requires the root development to half or 3/4 that can get a good blood supply<sup>[9]</sup>. Surgical removal is the final treatment when all other treatments fail. The present study found that surgical removal was used as the primary treatment, reaching 89%. Treatment with orthodontic traction was present in 20-32% of cases<sup>[1]</sup>.

At present, CBCT is used in impaction of teeth widely, also in transmigration. The impacted teeth of canines which could be three-dimensional reconstruction accurately by CBCT could be observed during sagittal, coronal, transverse or arbitrary plane in different directions and angles. The development and morphology of impacted tooth could be specific, and the position could be unequivocal. Then the treatment of the impacted teeth could be chosen better.

## Conclusion

In summary, the etiology of canine transmigration is complex. Early diagnosis of canine transmigration with the help of panoramic radiographs and CBCT can ensure a suitable treatment method for patients is chosen. This will result an effective treatment for the patient.

**Conflict of Interest:** No conflict of interest.

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