

## Mandibular Canine Transmigration – Two Case Reports

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**ABSTRACT**

**ABSTRACT:** Mandibular canine transmigration is a rare occurrence in oral cavity, the etiology of which is not clear. Maximum cases of transmigrate canine goes undetected and if reported, it is during routine radiological investigation. There are literatures published on singular or multiple cases of unilateral or bilateral occurrence of transmigration and their treatment. This paper reports two rare transmigrated mandibular canine cases (Mupparapu type 3 and type 5). Both types are considered as rarest types of transmigrant canine.

**KEY WORDS:** Ectopia, mandibular canine transmigration, transplantation, rare occurrence.

**INTRODUCTION**

Impacted teeth are important to dentistry and are particularly significant in orthodontics, especially if the impacted tooth is a canine. All orthodontic efforts should be made to restore the normal position of canine which is the functionally most useful tooth in the human dentition. En route to eruption, sometimes canine deviates from its programmed path and ends with some aberrant positions. It is an even rarer phenomenon when such an impacted mandibular canine migrates to the other side of the mandible, crossing the mandibular midline. It is a rare and special type of ectopia, believed to be unique to the mandibular permanent canine. This abnormal movement of a tooth, or an unerupted tooth across the midline without the influence of any pathological entity has been termed as transmigration. Most of the time, such migrated tooth remains impacted; however, sometimes it may subsequently erupt at its new position. The intraosseous migration of a tooth apparently starts during the early mixed dentition stage and may take place over a period of many years. In most cases no obvious factor is found which could explain the deviation of the mandibular canine.

**CLASSIFICATION**

M. Mupparapu<sup>1</sup> has classified transmigrant canine based on their migratory patterns and the final position within the jaw as below,

*Type 1:* Canine positioned mesio-angularly across the midline within the jaw bone, labial or lingual to anterior teeth, and the crown portion of the tooth crossing the midline.

*Type 2:* Canine horizontally impacted near the inferior border of the mandible below the apices of the incisors.

*Type 3:* Canine erupting either mesial or distal to the opposite canine.

*Type 4:* Canine horizontally impacted near the inferior border

of the mandible below the apices of either premolars or molars on the opposite side.

*Type 5:* Canine positioned vertically in the midline.

The majority of cases demonstrate Type 1 followed by Type 2, Type 3, Type 4 and Type 5.

**CASE REPORTS**

*Case 1 (Mupparapu Type 3):*

A 12 year old girl, presented to outpatient Department of Orthodontics and Dentofacial Orthopaedics; The Regional Dental College and Hospital; Guwahati; Assam, with chief complaint of erupting extra teeth in her lower front tooth region since 3 years. Her medical history was insignificant. Patient has symmetrical face, incompetent lips with convex profile and orthognathic divergence (Fig 1.1), on clinical intra-oral examination (Fig 1.2), left mandibular permanent canine space is present and right mandibular deciduous canine is retained. Teeth simulating permanent mandibular right and left canine were present in midline. The molar relation is Angle's class I with mild lower anterior crowding. Correlating panoramic radiograph (Fig 1.3), cone beam computed tomography (Fig 1.4) and clinical presentation revealed that right mandibular canine was transmigrated across the midline and erupted more labial and mesial to 42 and is seen labial to crown of 31. The left mandibular canine is seen erupted more mesial and labial to 32 and cusp tip is located 4.4 mm below the incisal surface of 32 and mild mesial rotation giving an mirror image to 43. This presentation strictly suggest Type 3 transmigration of canine according to Mupparapu. Retained deciduous 83 is seen with external root resorption. Lateral cephalometric analysis present deceleration CVMI stage, Class I skeletal relation and

horizontal growth pattern. Patient has orthognathic profile and protruded lower lip. Provisional diagnosis of these findings are i) Angle's class I molar relation superimposed on skeletal class I maxilla and mandibular relation with horizontal growth pattern, ii) Transmigrant canine in relation to 43. Two treatment plans are postulated i) Extraction of transmigrant 43 and bring 33 to the occlusion with in future periodic recall for deciduous 83, ii) extraction of 83 and transplantation of transmigrant 43 at its anatomical position. Second treatment option is selected for the patient.



Figure 1.2: Intra-oral photographs



Figure 1.3: Lateral cephalogram and orthopantomogram



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Figure 1.4: Cone beam computed tomography

Figure 1.1: Extra-oral photographs



Case 2 (*Mupparapu Type 5 – the rarest type*):

A 14 year old boy referred to our outpatient department by a general dentist with chief complaint of retained milk tooth in his lower anterior region. In clinical briefing, mandibular left deciduous canine is retained and contralateral permanent canine is present. Mild crowding is noted in the mandibular anterior region. On panoramic radiograph (Fig 2.1) examination revealed unerupted and transmigrated mandibular left canine in midline of mandible. The radiographic position of tooth was in accordance with type 5 transmigration pattern classified by Mupparapu. Parents were informed about the condition and advised for surgical removal of the transmigrant 33 and periodic recall for deciduous 73.



**Figure 2.1:** Orthopantomogram

## DISCUSSION

Transmigration word came into literature in 1964 after introduced by Ando et al<sup>2</sup> for the first time. Until then, this phenomenon has been referred with various nomenclature as malposition, migration, ectopic movement, transposition. Abnormal retention of mandibular deciduous canine and absence of permanent mandibular canine is prime indication of impacted canine and possibly transmigration. Shanmuhasuntharam et al<sup>3</sup> reviewed 25 references and stated predilection towards females than male and the right side of mandible is more affected than the left side. The degree of transmigration varies from mild cases where the canine had reached the midline to extreme cases where the canine had migrated to the contralateral first molar region. The transmigrated teeth could partially erupt either in line with the other teeth or out of the dental arch (usually buccal) or impacted and clinically undetectable. In our reported cases, case 1 is female with labial erupted transmigrated 43 whereas case 2 is male with clinically undetectable transmigration but clinically retained 73 gave probable idea of transmigration of canine.

In 1964, Ando and his associates<sup>2</sup> did a prospective study to support the transmigration theory. By their series of radiographs taken over a seven year period in a five years ten months old boy, showed that a canine did migrate from its original site through the symphysis to the contralateral side of the mandible. There are number of suggested etiology for transmigration. Heredity<sup>4</sup> has been suggested as one of the causative factor. The most commonly accepted etiology is the abnormal displacement of the dental lamina in the embryonic life and non-eruption of such canine. As per Noidine<sup>5</sup>, obstacles, such as a small root fragment or an odontome, could divert a tooth from its normal path of eruption. Ando et al.<sup>2</sup> suggested that agenesis of permanent lateral incisors may result in deviated path of eruption of canine leading to transmigration. According to Al-Waheidi<sup>6</sup>,

transmigrated canines are usually associated with a cystic lesion and that the presence of a cyst at the crown of the canine may facilitate the migration process. A cyst is an expansive lesion and is likely to displace the tooth in any direction in the least resistance path, therefore the role of cystic lesions in the etiology of transmigration is doubtful<sup>4</sup> and it also violets the transmigration definition as the transmigration of the tooth shouldn't have any pathological conditions associated with the tooth<sup>9</sup>. The axial inclination of impacted canines has influence on its migration<sup>7</sup>. Crossing the midline become a rule when axial inclination of impacted canine to the midsagittal plane exceeds 50° and according to Joshi<sup>8</sup> this ranged from 45° to 95°. The particular conical shape of the canine crown and abnormally strong eruptive forces are believed to facilitate deviation and migration of the tooth through dense symphysis, crossing the midline. Probable etiology for our case 1, the retained 83 has deviated the tip of permanent canine directed towards more left side and erupted more labially, further its horizontal tilting towards mesial side and strong eruptive driving force caused the canine to cross symphysis, leading for transmigration.

There are several treatment option available for impacted canine some of them are hold good for the transmigrated canine. Transmigrated canine which are erupted favourably into oral cavity should get orthodontic intervention followed by reshaping or prosthetic correction if required<sup>9</sup>. Unfavourably erupted transmigrant canine can be extracted if there is no option for transplantation. For intraosseously impacted transmigrant canine, if unfavourably impacted without symptoms, should be radiographically monitored. If neurological pain or any pathology are associated with impacted transmigrant canine, then canine should be extracted surgically. Favourable impacted position which can't be pulled by orthodontic force, transplantation could be the treatment option provided retained deciduous tooth is present and maintained the space for the canine<sup>4</sup>. Treatment option for impacted transmigrant canine is traumatic and require skilful maxillofacial surgeon and experienced orthodontist. If otherwise not indicated, the impacted transmigrant canine is better to be monitored conservatively with periodic radiograph for pathology.

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