



Unusual permanent maxillary and mandibular canine transmigration – Report of two new Indian cases

*Dr. Nagaveni NB¹, Dr. Umashankara KV², Dr. Kamala DN³, Muggalla Annie Glory⁴

¹ Specialist in Pediatric Dentistry, Professor, Academic Researcher Garike Dental Care, Davangere, Karnataka, India.

² Oral and Maxillofacial Surgery

³ Advisor (Oral Care), Bangalore, Karnataka, India.

⁴ Under-Graduate Student, Malla Reddy Institute of Dental Sciences, Hyderabad, Telangana, India.

DOI: 10.5281/zenodo.17258036

Submission Date: 30 Aug. 2025 | Published Date: 03 Oct. 2025

*Corresponding author: **Dr. Nagaveni NB**

Specialist in Pediatric Dentistry, Professor, Academic Researcher Garike Dental Care, Davangere, Karnataka, India.

Abstract

An unusual and uncommon dental anomalies and tooth developmental abnormalities are encountered in human being due to nature's constant evolutionary phenomenon. Dental anomalies can affect any part of the tooth including either crown or root structure resulting various developmental malformations with respect to size, tooth number, tooth structure, tooth composition and tooth shape. Tooth developmental variations include ectopic eruption, delayed eruption, impaction, tooth transposition and tooth transmigration. Most of these developmental variations are always found hidden in the bone and bypassing from the clinical examination. The purpose of this research paper is to present occurrence of unusual maxillary canine and type V mandibular permanent canine transmigration which occurred in two Indian patients. The research paper also critically discusses the different topographic classification of the mandibular canine transmigration evident in the literature.

Keywords: Canine impaction, Canine transmigration, Dental anomalies, Tooth impaction, Transmigration classification.

Introduction

Various eruption related tooth developmental disturbances are encountered in routine dental practice such as ectopic eruption, tooth transposition and tooth transmigration and delayed eruption. Among these, ectopic eruption and tooth transmigration are clinically diagnosed as they are noticed after tooth eruption. Whereas, tooth transmigration is noticed only on radiographic examination as it is always found within the bone. 'Tooth transmigration' refers to a condition where 'an impacted tooth moves within the dental arch crosses the dental midline and seen in opposite side of the arch.' [1]. The tooth most commonly affected by this condition is the mandibular canine followed by maxillary canine [2,3]. Reports showing transmigration of maxillary and mandibular permanent central incisors are very few in number [4]. In transmigration cases, the impacted tooth is completely developed and found asymptomatic within the bone. Clinically there may be over-retained primary tooth or missing tooth or with space existed. In such instances, the subject is made to undergo thorough radiographic evaluation [5]. In some cases, the transmigrated tooth is found associated with either cystic changes or tumor malformation. Therefore, whenever a clinician come across retained primary tooth exceeding its normal exfoliation time or any permanent tooth missing, he or she always should think of tooth transmigration. There is no exact etiology behind why the impacted tooth moves within the dental arch and crosses the dental midline. What force enables the tooth to move is also not properly explained in the dental literature [1-3]. Based on the position of the migrated impacted tooth, Mupparapu [6] classified tooth transmigration into five types (Table 1). Mupparapu classification is applicable only to mandibular canines, as the incidence of occurrence of maxillary canine transmigration is a rare entity [6]. With this brief introduction, the present research paper aims to show case occurrence of one maxillary canine transmigration and type V mandibular canine transmigration case in two Indian patients.

Table 1: Mupparapu Classification on Permanent Mandibular Canine Transmigration ^[6]

Type	Description
Type 1	The impacted canine is mesioangularly crossing the midline, labial or lingual to the anterior teeth, with the crown portion of the tooth crossing the midline.
Type 2	The canine is horizontally impacted near the inferior border of the mandible below the apices of the incisors.
Type 3	The canine has erupted either mesial or distal to the opposite canine.
Type 4	The canine is horizontally impacted near the inferior border of the mandible below the apices of either premolars or molars on the opposite side.
Type 5	The canine is positioned vertically in the midline with the long axis of the tooth crossing the midline.

Case Study

Transmigration of maxillary right canine and mandibular permanent right canine was noticed in two Indian patients. Demographic details of the patient are described in Table 2. Both patients were apparently normal and did not show any signs and symptoms of systemic, metabolic or syndromic disorders. To attend the chief complaint in both patients' radiographic examination using orthopantomograph was carried out. On radiographic examination transmigration of maxillary right canine and mandibular right canine was observed. As both impacted and transmigrated canines were not associated with any pathology or symptoms, wait and watch approach was followed attending only chief complaint of the patient.

Table 2: Demographic details of patients with transmigration of permanent canines.

Case No.	Age/ Gender/ Ethnicity	Chief Complaint	Clinical Features	Radiographic Features (Figures 1 & 2)
1.	38 years Male Indian	Complaining of pain in the right lower back tooth region from past one week	Clinically missing mandibular right canine. Remaining all permanent teeth erupted including third molars.	A horizontally impacted and transmigrated mandibular permanent right canine observed (Figure 1). Three fourth part of the impacted canine transmigrated to the opposite side of the arch crossing the dental midline. The transmigrated canine was located at the inferior border of the mandible below the roots of mandibular incisors in horizontal position.
2.	35 years Male Indian	Complaining of pain in the right lower back tooth region from past 4 days	Deep proximal dental caries involving mandibular right second molar. Clinically missing maxillary right permanent canine Over-retained primary right canine	A mesioangularly impacted and transmigrating maxillary permanent right canine was observed. One third crown portion of the impacted canine was transmigrated crossing the dental midline towards the opposite side. Congenital agenesis of maxillary left third molar (Figure 2)



Figure 1: Panoramic radiograph showing mandibular right canine transmigration (red arrow). Almost $\frac{3}{4}$ th portion of the canine has transmigrated to the opposite side crossing the dental midline (blue line).

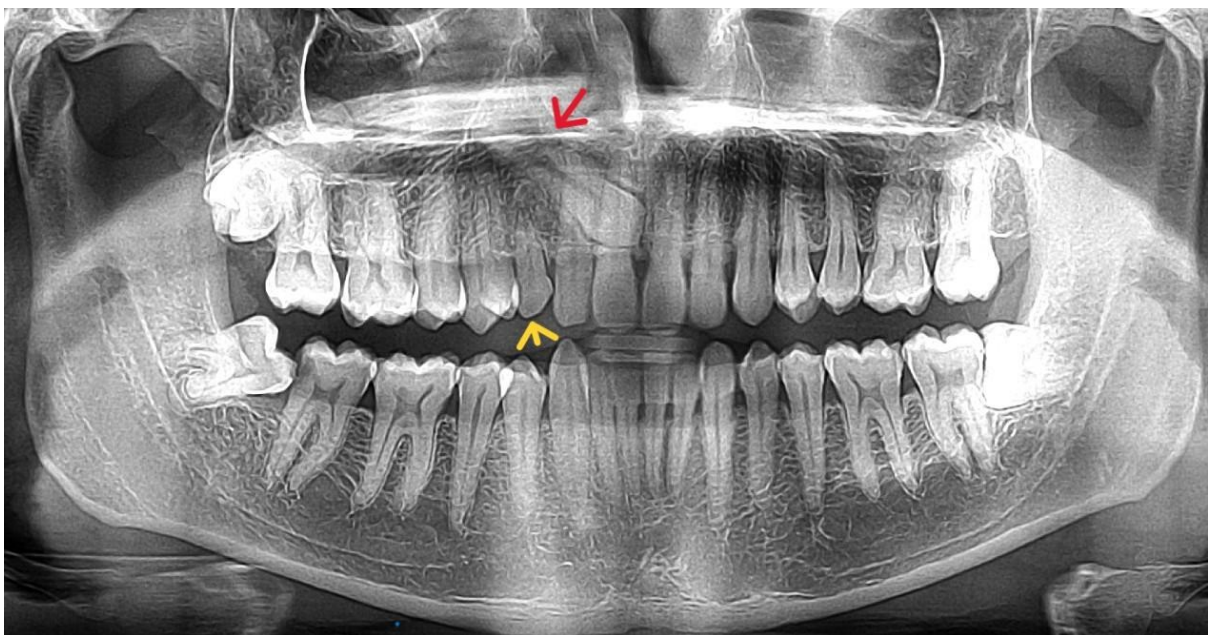


Figure 2: Orthopantomograph showing transmigrating maxillary right canine (red arrow). Retained right primary canine is also present (yellow arrow).

Discussion

The prevalence of canine transmigration is relatively a rare phenomenon. The prevalence varies among different population across the world [7-9]. Mohan et al identified 341 cases of canine transmigration among 30,000 panoramic radiographs showing a prevalence of 1.1% in Indian population [1]. Another study reported a prevalence of 0.8% of mandibular canine transmigration among Turkish population [10]. Nagaveni et al [3] from India has performed an extensive research work on dental anomalies including permanent canine transmigration in context to Indian ethnic population. Author has published numerous case studies [4,5,7-9,11-13] showcasing an array of transmigrated both maxillary and mandibular canine, transmigrated canine associated with other dental anomalies and developmental disturbances among children and adults [4,5,7-9,11-13]. The same researcher recently performed a radiographic prevalence study on occurrence of canine transmigration in Indian population [3]. Nagaveni et al have also reported transmigration of maxillary central incisors [4] and maxillary canines [5,9,12] which is a rare dental entity.

Diagnosis and classification of any dental pathology is important to face challenges in categorization and providing appropriate treatment [12-17]. The credit of classifying different types of canine transmigration first goes to a great researcher, Mupparapu [6]. However, various authors/researchers have given different explanation for the term transmigration. Joshi [2] explained that it is not how far the tooth moves within the jaw, but rather its tendency or attempt to cross the dental midline or midline suture. Mupparapu has given classification based on the pattern of intrabony

migration of the mandibular canine rather than the maxillary canine [6]. He classified canine transmigration into five types. Although this classification has been used these days, but recently few other researchers have raised about some of its disadvantages. Mupparapu [6] has addressed only about the unilateral occurrence but not about the bilateral occurrence of canine transmigration. There are some publications showing bilateral presentation of mandibular canine transmigration. Moreover, the general criteria of this classification can cause subjective interpretations and inconsistent diagnoses. This classification also focuses on the positional aspect of the canines without providing comprehensive guidance on the implications for treatment planning. As a result, science/literature raises a 'quest' for the invention of new classification as dental anomalies can develop/appear/present in any form. A group of Indian authors based on their survey carried out at a tertiary dental health care center using panoramic radiographs introduced a novel classification system for mandibular canine transmigration consisting of group I, II, III, IV and V types [1]. This classification is termed as MBS classification. In this classification, the transmigration patterns of mandibular canines were categorized using the criteria like, the axial inclination of the canine, the distance travelled by the transmigrated canine and whether transmigrated canine is unilateral or bilateral (Table 3) [1]. Another Indian study using panoramic radiographs as a study tool found a prevalence of 1.88% in Indian population. In this study the age of patients ranged from 15 to 35 years consisting of 216 females and 209 males [14]. About 75% of mandibular canines were found on the left side, with 25% on the right. No bilateral occurrence of transmigration was noticed in this study [14]. In the article presented here, in case 1, the transmigrated canine was classified as type II according to Mupparapu and Group III, Horizontal according to MBS classification. In case 2, as the transmigrated canine was in the maxilla, there is no any classification criteria given in the literature. so based on its position it was described as mesio-angular impaction with oblique orientation. This strongly indicates lacunae in prevalence studies to explore large number of maxillary canine transmigration cases in order to frame precise classification guidelines.

Table 3: MBS classification for permanent mandibular canine transmigration [1]

Classification	Description
Group I	Partial crown transmigration. It can be • Vertical • Oblique • Horizontal
Group II	Complete crown transmigration. It can be • Vertical • Oblique • Horizontal
Group III	Complete crown with partial/complete root transmigration: Mesial to mental foramen. It can be • Vertical • Oblique • Horizontal
Group IV	Transmigration – distal to mental foramen Mostly horizontal
Group V	Bilateral transmigration

The exact etiology behind transmigration of mandibular canines is not known. However, literature provides numerous factors as a possible causative factor. Few authors related the mechanism with respect to position of the tooth with its long axis. Howard researcher explained that when the inclination of the impacted canine ranges from 25 to 30 degree in the midsagittal plane, the tooth can move but does not migrate across the midline. When the inclination falls between 30 and 95 degree the canine tends to cross the midline or midline suture. Compared to mandible, transmigration of canines in the maxilla is a rare phenomenon. The reason behind this incident is due to the strong mid-sagittal suture and type of the maxillary bone. Hence, impacted canines rarely cross completely by moving through the mid-sagittal suture. Therefore, there are no reports showing complete or three fourth of maxillary canine transmigrating to the opposite side of the dental arch. In number of case series reported by Indian author [9,12,16,18] illustrated most of oblique type of canine impaction with only one third of crown portion crossing the mid-sagittal suture.

The precise classification of canine transmigration helps in planning appropriate treatment strategies. Based on MBS classification, authors suggested that group I and II vertical or oblique type cases can be treated with surgical removal or auto-transplantation. Horizontal cases usually require surgical removal when they become symptomatic. It is suggested in the literature that orthodontic repositioning of transmigrated tooth is not possible when the crown tip migrates beyond the lateral incisor root apex. In cases with Groups III, IV and V, surgical removal is essential due to severe migration and risks to adjacent structures. However, in the cases presented here, as there were no any pathology or symptoms associated with transmigrated canines, only observation was suggested for the patients without rendering any treatment.

Conclusion

All the transmigrated mandibular canines are unerupted and hidden in the bone escaping from early detection and diagnosis. Therefore, every dental professional should have enough knowledge about prevalence in different population, their diagnosis, classification in order to provide age-appropriate dental treatment thereby avoiding future complications and consequences.

References

1. Mohan, M., Pillai, S. B., & Sreejith Kumar, G. (n.d.). *Prevalence of canine transmigration: Introducing a novel classification for mandibular canine transmigration*.
2. Joshi, M. R. (2001). Transmigrant mandibular canines: A record of 28 cases and a retrospective review of the literature. *Angle Orthodontist*, 71(1), 12–22.
3. Nagaveni, N. B., Mahantesh, S. P., Saraf, S., & Umashankar, K. V. (2025). Transmigration of permanent canines in South Indian population: A radiographic prevalence study. *Journal of Medical Research and Surgery*, 2(1), 1–6.
4. Nagaveni, N. B. (2023). Transmigration of permanent maxillary central incisor. *Global Journal of Research in Dental Sciences*, 3(4), 5–8.
5. Nagaveni, N. B. (2023). Intraosseous transmigration of permanent maxillary right canine: Report of a rare case. *Oral Health and Dentistry*, 6(1), 22–26.
6. Mupparapu, M. (2002). Patterns of intra-osseous transmigration and ectopic eruption of mandibular canines: Review of literature and report of nine additional cases. *Dentomaxillofacial Radiology*, 31(6), 355–360.
7. Nagaveni, N. B. (2023). Type I transmigration of permanent mandibular right canine: Report of a rare case. *Journal of Pathology and Allied Medicine*, 4, 1–5.
8. Nagaveni, N. B., Radhika, N. B., Umashankara, K. V., & Satisha, T. S. (2011). Concomitant occurrence of canine transmigration and symmetrical agenesis of mandibular incisors: A case report. *Bangladesh Journal of Medical Science*, 10(2), 133–136.
9. Nagaveni, N. B. (2024). Mirror image canines in association with multiple dental anomalies: Report of a unique case. *Dental Science Innovation Research*, 3(1). <https://doi.org/10.61148/DSIR/004>
10. Aktan, A. M., Kara, S., Akgunlu, F., & Malkoc, S. (2010). The incidence of canine transmigration and tooth impaction in a Turkish subpopulation. *European Journal of Orthodontics*, 32(5), 575–581.
11. Nagaveni, N. B. (2023). Permanent mandibular intrabony canine transmigration (type I): A rare case report. *Journal of Surgery and Anesthesia*, 1(1), 1–2.
12. Nagaveni, N. B. (2023). Transmigration of maxillary canine in association with bilateral agenesis of permanent mandibular canines: Report of a rarest case with literature review. *Journal of Oral Health and Dentistry*, 6, 596–602.
13. Nagaveni, N. B. (2012). An unusual occurrence of multiple dental anomalies in a single non-syndromic patient: A case report. *Case Reports in Dentistry*, 2012, Article ID 426091. <https://doi.org/10.1155/2012/426091>
14. Sathyanarayana, H. P., Nucci, L., d'Apuzzo, F., Perillo, L., Padmanabhan, S., & Grassia, V. (2023). Prevalence, etiology, clinical features and management associated with impacted and transmigrated mandibular canines: A systematic review. *BMC Oral Health*, 23, 975. <https://doi.org/10.1186/s12903-023-03327-1>
15. Nagaveni, N. B., & Umashankar, K. V. (2024). Cursed canines: The fate of unerupted permanent canine teeth. *Global Journal of Research in Dental Sciences*, 4(5), 18–21.
16. Nagaveni, N. B. (2024). Maxillary canine transmigration: Report of an unusual tooth eruption phenomenon. *Global Journal of Research in Dental Sciences*, 4(4), 4–7.
17. Nagaveni, N. B. (2024). Co-existence of mandibular dens retromolar and canine transmigration in a single non-syndromic patient: A rarest case report. *Global Journal of Research in Dental Sciences*, 4(4), 13–16.
18. Nagaveni, N. B. (2024). A hidden truth: Report of a unique case with multiple anomalies in an Indian patient. *Global Journal of Research in Dental Sciences*, 4(1), 22–25.

CITATION

Nagaveni NB, Umashankara KV, Kamala DN, & Muggalla A. G. (2025). Unusual permanent maxillary and mandibular canine transmigration – Report of two new Indian cases. In *Global Journal of Research in Dental Sciences* (Vol. 5, Number 5, pp. 36–40). <https://doi.org/10.5281/zenodo.17258036>