

## INCIDENCE OF MANDIBULAR AND MAXILLARY IMPACTED CANINES TRANSMIGRATION:A RETROSPECTIVE STUDY

### ALT VE ÜST ÇENEDEKİ GÖMÜLÜ KANİNLERİN TRANSMİGRASYON İNSİDANSI:RETROSPEKTİF BİR ÇALIŞMA

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#### ABSTRACT

**Aim:** We attempted to determine the incidence of transmigrant maxillary and mandibular canine teeth, assess pathological changes and treatment choices.

**Material and Methods:** We planned a retrospective study based on panoramic radiographs and clinical records. Transmigrate canines (TCs) were scanned in the panoramic radiographs. When a TC was determined, age and sex, presence of primary canines, radiographic data from the adjacent teeth and treatment choice (extraction, orthodontic treatment or periodical follow-up) were taken from the patient's records.

**Results:** We found 8 TCs (4 in maxilla, 4 in mandible) in 8 patients (4 males, 4 females). The rate of transmigration was 0.08%. Three of TCs were in the right and 5 were in the left side. None of the TCs showed pathological signs such as expansion of the dental follicle around the crown, cysts, or root resorption of adjacent teeth.

**Conclusion:** TCs are seen both in upper and lower jaws. Early detection of them can improve the prognosis and treatment outcomes. It also helps preventing the complications that may occur later on time.

**Keywords:** Canine tooth, transmigration

#### ÖZ

**Amaç:** Transmigrant maksiller ve mandibular kaninlerin insidansını belirlemek, patolojik değişiklikleri ve tedavi seçeneklerini değerlendirmektir.

**Gereç ve Yöntem:** Panoramik radyograflara ve klinik kayıtlara dayanan retrospektif bir çalışma planladık. Transmigrant kaninler (TK), panoramik radyografı tarandı. TK saptandığında, yaş, cinsiyet, süt kaninlerin varlığı, komşu dişin radyografi ve tedavi seçeneği (çekim, ortodontik tedavi veya periyodik takip) hastaların kayıtlarından alındı.

**Bulgular:** Sekiz hastada 8 TK (4 maksilla, 4 mandibula) bulundu. Transmigasyon oranı %0.08'di. TK'lerin 3'ü sağ tarafta ve 5'i sol taraftaydı. Hiçbirinde kurunun etrafındaki dental folikülde genişleme veya komşu diş kökünde rezorpsiyon görülmedi.

**Sonuç:** TK'ler hem alt çenede hem de üst çenede görülebilir. Erken teşhis prognozu ve tedavi sonuçlarını iyileştirebilir. Zamanla oluşabilecek olan komplikasyonları önlemeye de yardımcı olur.

**Anahtar Kelimeler:** Kanin diş, transmigasyon

#### INTRODUCTION

Tooth impaction is an endemic dental problem<sup>1-4</sup>. If a tooth is unerupted more than twelve months after the normal age for eruption has been reached; it is called as "impacted"<sup>5</sup>. The incidence of impacted teeth has been reported between 6.9% and 76.6%<sup>1-6</sup>. The most frequently impacted teeth are third molars,

upper canines, upper central incisors and upper premolars, respectively<sup>7-9</sup>. Although many impacted teeth are asymptomatic, they can cause movement or external root resorption of the adjacent teeth, cystic lesions, and especially in partial eruption cases, infection, pain and trismus<sup>10</sup>.

Migration of teeth which are impacted in the bone is an unusual situation and its mechanism is still unknown<sup>11,12</sup>. The canine's migration in the bone initiates in early mixed dentition and it frequently

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continues until apexification is occurred<sup>13</sup>. Transmigration is an exaggerated form of migration and it is a preeruptive movement of tooth across the midline<sup>11,14-17</sup>. In 1964, Ando *et al.*<sup>18</sup> first used the term of "transmigrant" for a mandibular impacted canine. Later, Aydın and Yılmaz in 2003 first reported transmigration of impacted maxillary canines<sup>16</sup>.

TC's may cause pressure resorption of adjacent teeth's roots, they may be displaced to remote areas such as coronoid process or mandibular condyle<sup>19</sup> or lead to neuralgic symptoms Early diagnosis of these teeth is important for both orthodontic and surgical concerns<sup>20</sup>.

The aim of our study was to evaluate the incidence of transmigrant canine teeth, assess pathological changes and treatment choices.

## MATERIAL AND METHODS

We planned a retrospective study based on clinical records and panoramic radiographs were taken on patients who presented to Oral and Maxillofacial Surgery Department at Necmettin Erbakan University Faculty of Dentistry between September 2014 and March 2016. Transmigrant canines (TCs) were scanned in the panoramic radiographs of patients over the age of 14. We accepted the migration of a canine through midline in mandible and across the mid-palatal suture in maxilla, as transmigration (Figure 1, 2)<sup>13</sup>. When a TC was determined, following clinical and radiological data were taken from patient's record:

1. Age and sex
2. Presence of primary canines
3. Radiographic data from the adjacent teeth (occurrence of root resorption)
4. Treatment (extraction, orthodontic treatment or periodical follow-up)

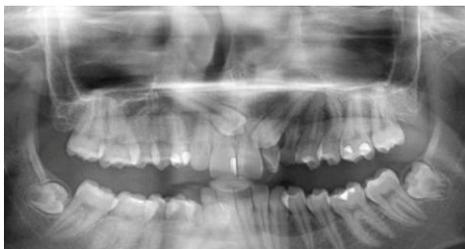


Figure1. Panoramic image showing transmigrant maxillary canine

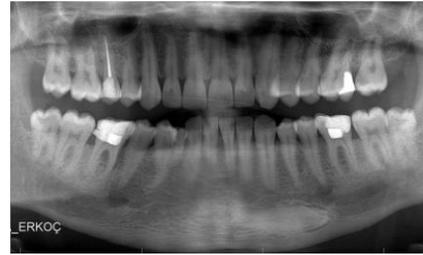


Figure 2. Excessively transmigrated mandibular canine

## RESULTS

We scanned a total of 10,150 patient records who were all older than age 14. The patients aged between 18 to 88 years (mean age 40.63, SD 25.07). We found 8 TCs (4 in maxilla, 4 in mandible) in 8 patients (4 males, 4 females). The rate of transmigration was 0.08% (Table 1). Three of TCs were in the right and 5 were in the left. Two patients had both transmigrant upper canine and impacted upper canine. Four patients had unexfoliated primary canines (2 in maxilla, 2 in mandible). None of the TCs had pathological signs such as expansion of the dental follicle around the crown, cysts, or root resorption of adjacent teeth. All TCs were left in place. None of them was orthodontically managed or surgically operated (Table 2).

Table 1. Incidence, age, and sex ratio for transmigrant canines

TCs	Cases	Incidence	Female	Male	Gender ratio	Mean age (SD)	Age range
8	8	0,08%	4	4	1:1	40.63 (25.07)	18-88

Table 2. Clinical and radiographic features of transmigrant canines

Patient number	Age	Sex	Max/Mand	Uni/Bi	Side	Primary teeth	Treatment protocol	Associate pathology
1	23	F	Max	Uni	R	CR	observation	None
2	38	M	Max	Uni	R	CR	observation	None
3	33	M	Mand	Uni	L	CR	observation	None
4	29	F	Mand	Uni	L	CE	observation	None
5	88	M	Max	Uni	L	CE	observation	None
6	23	M	Mand	Uni	L	CE	observation	None
7	73	F	Mand	Uni	R	CE	observation	None
8	18	M	Mand	Uni	L	CR	observation	None

F, female; M, male; Maxilla, Max; Mand, Mand; Uni/Bi, unilateral/bilateral L, left; R, right; CR, retained primary canine; CE, exfoliated primary canine

## DISCUSSION

Impacted tooth is a term used for teeth that have not been placed in dental arch because of various obstacles or during normal erupting without any barrier.<sup>17</sup> Insufficient dental arch length, supernumerary teeth, premature loss or retention of primary teeth, trauma, wider crowns, genetic factors, tumors, cysts may be the reasons of impaction<sup>11,14,15,18,21,22</sup>. The etiology of transmigration is unknown; however, abnormal displacement of the tooth bud or deviation during development is the most commonly accepted explanation.<sup>23</sup>

Although unerupted maxillary canine is seen almost 20 times more frequent than mandibular canines, it is interesting that TCs are more common in the mandible<sup>3</sup>.

That difficulty of maxillary canine transmigration could be explained in several ways: Firstly, midpalatal suture can act as a barrier and prevent transmigration<sup>2,19,24</sup>. Secondly, maxillary incisors radices are longer than mandibular incisor roots and the short distance between the base of the nose and apices of the incisors, which makes the transmigration more difficult<sup>3,18</sup>. Finally, it has been suggested that the most important factor in maxillary canine transmigration is their positions and angulations<sup>13</sup>.

Torres- Lagares *et al.*<sup>5</sup> reported that TCs can be detected at any age between 8 and 62 years. Büyükkurt *et al.*<sup>25</sup> found that TCs are usually unilateral and symptomless, left side being more common. It has been stated that there is a predilection for women<sup>5</sup>, however, others have reported that both gender have equal incidence for transmigrant maxillary canines<sup>21, 26</sup>. In our study, 8 patients had unilateral TCs. Five of them were at the left side, 3 were at the right. Transmigration rates were the same for men and women (4 men and 4 women).

TCs are generally found to be fully impacted. Mazinis *et al.*<sup>27</sup> reported six mandibular TCs, which all of them were fully impacted, and no maxillary TCs in 3586 patients. Aydın *et al.*<sup>21</sup> reported 8 mandibular and 6 maxillary TCs in 4500 patients and except for maxillary one, the rest of the TCs were fully impacted. Similarly, Aras *et al.*<sup>26</sup> found 12 maxillary TCs in 6000 patients and they were all fully impacted as well. In our study, all of the TCs were fully impacted like the aforementioned reports.

Transmigration of canines is more common in mandible. In a study conducted by Kamiloglu *et al.*<sup>28</sup>, prevalence of mandibular transmigration was found 0.44%. Shah *et al.*<sup>6</sup> scanned 7886 patients and found the transmigration rates as 0.1% for mandibular canines. Aktan *et al.*<sup>29</sup> studied in a Turkish population and their results indicated 0.34% mandibular and 0.14% maxillary TCs. In our study, we found the total transmigration rate as 0.08%. The prevalence was the same for the maxilla and the mandible, that is, 0.04% for each jaw.

If the permanent canine is not in its accurate position, it cannot resorb the primary tooth's root and retention is more likely. Some clinicians suggested extraction of the primary canines to stimulate normal development of the underlying permanent tooth<sup>13</sup>. However, not all researchers agree with this<sup>26</sup> and we also think that presence of a primary tooth might not be an etiological factor in transmigration. Indeed, in our study, five primary canines were already exfoliated or have been extracted in patients who had TCs.

Different treatment options have been suggested for management of TCs. These are observation, surgical extraction, transplantation, bringing to the original position of the unerupted canine by surgical and orthodontic treatment<sup>18,27,28,30</sup>.

Diaz-Sanchez *et al.*<sup>31</sup> made a review through the literature between 1951 and 2015, and they found that the most preferred treatment choice was surgical extraction. They also reported that periodic clinical and radiographical examination should be done in cases which do not require extracting.

If TCs lead to infection, cyst, tumors, neuralgic symptoms, periodontal damage in adjacent teeth or root resorption and transplantation or orthodontic intervention is not possible, then extraction should be considered<sup>32</sup>.

Kumar *et al.*<sup>33</sup> reported that 1 of 5 transmigrant canines was performed orthodontic treatment and the others would be followed periodically.

Transplantation of TCs has been rarely accepted. Orthodontic assisted eruption is nearly impossible if the tooth is just below the roots of the lower anterior teeth and horizontally aligned. Thus, if they are asymptomatic, they may be left in place with routine radiographic evaluation<sup>34</sup>.

Umashree *et al.*<sup>35</sup> reported that 3 of 4 transmigrant canines would be followed periodically and



only one TC was extracted. Similarly, Ün *et al.*<sup>36</sup> did not make any intervention for 5 mandibular TCs.

According to our patients' records, all TC's were asymptomatic. None of the patients had any complaint which could be attributable to TCs and there is no pathological changes associated with TC's. All TCs were left without any intervention.

## CONCLUSION

Transmigration of the canine teeth is seen both in upper and lower jaws. Although the prevalence of TCs are not high, if permanent canines are not seen in the mouth, we recommend taking a panoramic radiograph. Early detection of them can improve the prognosis and treatment outcomes. It also helps preventing the complications that may occur later on time.

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