

# Evaluation Of The Incidence Of Impacted Tooth In Southern Turkish Population Aged Between 15 And 35 Years: An Epidemiological Study

## 15-35 Yaş Arası Güney Türk Popülasyonunda Gömülü Diş Sıklığının Değerlendirilmesi: Epidemiyolojik Çalışma

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### Öz

**Amaç:** Bu retrospektif çalışmada üçüncü molar dişler hariç diğer dişlerin gömülü kalma sıklığının araştırılması amaçlanmıştır. **Gereç ve Yöntem:** Bu çalışmaya 2674 erişkin birey (Erkek/Kadın:1146/1528) (% 42.8/ %57.2) dahil edildi. Hastaların panoramik radyogramları gömülü dişlerin varlığı açısından üç oral ve maksillofasiyal radyoloji uzmanı tarafından değerlendirildi. Gömülü dişlerin; cinsiyet ve çenelerdeki dağılımlarını karşılaştırmak için ki-kare testi kullanıldı. P <0.05 istatistiksel olarak anlamlı kabul edildi. **Bulgular:** 135 hastada toplam 167 gömülü diş saptandı. Bunların 74'ü kadınlarda, 61'i erkeklerde idi. Gömülü dişlerin büyük kısmı maksiller kaninlerden oluşmaktaydı. **Sonuç:** Bu epidemiyolojik çalışma önceki çalışmalarla büyük benzerlikler göstermektedir ve aynı toplumda daha fazla sayıda birey üzerinde incelenmesi uygundur.

**Anahtar Kelimeler :** Gömülü dişler, Radyogram, Zahiri hipodonti

### Abstract

**Objective:** The objective of this study was to investigate the incidence of teeth other than the third molar teeth to remain impacted. **Material & Methods:** A total of 2674 adult persons (Male/Female: 1146/1528; 42.8%/57.2%) were included in this study. Panoramic radiograms of the patients were evaluated by three oral and maxillofacial radiology specialists for the presence of impacted teeth. Chi-square test was used to compared the distribution of the impacted teeth to genders and localization in the maxilla and mandible. P <0.05 values were considered statistically significant. **Results:** A total of 167 impacted teeth were found in 135 patients. Of these, 74 were in females and 61 in males. Majority of the impacted teeth consisted of maxillary canines. **Conclusion:** This epidemiological study showed close similarities with the previous studies, and we recommend examination on a larger number of individuals in the same population.

**Keywords:** Impacted teeth, Radiogram, Apparent hypodontia

## Introduction

Impacted teeth are defined as the teeth that could not take their places in the dental arch during the expected normal eruption period due to various reasons, causing clinically important outcomes (1,2). Numerous systemic factors such as the local reasons including pressure applied by the adjacent teeth, increased density in the bone and soft tissue, chronic infections in the surrounding soft tissues, insufficient mandibular growth, lack of space in the maxilla, and persistence of the deciduous teeth, and some endocrinological (hypothyroidism) and metabolic disorders (mucopolysaccharidosis), anemia, systemic reasons such as vitamin D deficiency (rickets), Down's syndrome, syndromes like cleidocranial dysplasia, and achondroplasia, and systemic infections (tuberculosis, congenital syphilis), developmental disorders such as cleft palate and lip cause the teeth to remain impacted (2).

Transmigration is defined as the migration of an unerupted tooth to the opposite side by passing the middle line in the alveolar bone. Impacted teeth may remain asymptomatic in the alveolar bone without causing any symptom and pathology for a long time, as well as they may lead to root resorption in the neighboring teeth, temporomandibular joint disorders, neuralgiform pain, local infections, cystic and neoplastic pathologies (3). Impaction of the teeth may be restricted to a single tooth as well as may affect all teeth. Both permanent and deciduous teeth may remain impacted. Impacted teeth are more infrequently seen in the primary dentition period, and the differential diagnosis should be made in order to distinguish from ankylosis induced secondary retention cysts(2).

The most common impacted teeth among the permanent teeth are the third molar (4,5) followed by maxillary canine, maxillary and mandibular premolar, and maxillary lateral. The reason for the third molar teeth to remain impacted has been shown as lack of sufficient place in the maxilla due to being the last erupted teeth. There are many studies evaluating the incidence of impacted third molar teeth (6-8). This is the case also for the maxillary canine teeth that may often remain impacted. Because they erupt after the maxillary lateral and maxillary first premolar and can not found a sufficient place.

There are different results in terms of the incidence of impacted teeth in the mandible and maxilla, with some were more common in the mandible, and the others in the maxilla (6,9,10). In contrary to the studies reporting no difference between the genders in terms of the incidence of impacted teeth (7,11), there are also studies stating more common impacted teeth in women than in men (12).

The objective of this study was to determine the incidence, localization, and gender distribution of the impacted teeth seen on permanent dentition other than the third molar teeth in Southern Turkish population aged between 15 and 35 years.

## Material & Methods

This study was designed as a retrospective study to evaluate panoramic radiograms of the patients who presented to the Akdeniz University, Faculty of Dentistry, Department of Dental and Maxillofacial Radiology for routine examination between January 2015 and June 2016. A total of health 2674 adult persons (Male/Female: 1146/1528; 42.8%/57.2%) who had no systemic and/or congenital disease and no history of orthodontic treatment were included in the study. The gender and age distributions of the subjects are presented in Table 1. All permanent teeth except the third molar were evaluated with a high quality panoramic radiograph (PR). As the study was conducted to retrospectively evaluated panoramic radiograms of the patients, no ethical committee approval was received.

Panoramic radiograms of the persons with missing teeth and those with impacted teeth which at least 75% of the development had not been completed were excluded from the study (Figure 1). The demographic patient data were accessed through electronic patient files.

Panoramic radiograms of all patients were taken in the Akdeniz University, Faculty of Dentistry, Department of Dental and Maxillofacial Radiology by the same persons with PLANMECA, OY 00880 (Helsinki, Finland) device in a patient standing on vertical position using an appropriate radiation dose. All panoramic radiograms were evaluated by three oral and maxillofacial radiology specialists. The teeth recognized as impacted by all three specialists and the information about the gender and localization (mandible-maxilla) were recorded. Interobserver

reliability was found as 98%.

### Statistical analysis

Statistical analyses were performed using SPSS (Statistical Package for Social Sciences; 21.0, SPSS Company, Illinois, USA) for Windows (21.0, SPSS Company, Illinois, USA) software. Comparison of the incidence of impacted teeth between the groups and genders was made using Chi-square test. A P value <0.05 considered statistically significant.

### Results

Of the 2674 persons included in the study, 1528 were females (57.2%) and 1146 males (42.8%). The mean age was found as  $24.08 \pm 6.57$  years in females,  $26.36 \pm 4.59$  years in males and  $25.05 \pm 5.68$  years in entire group. Age difference was not statistically significant between the genders ( $P > 0.05$ ). Impacted teeth were found in a total of 135 persons (5.04%). Of the 135 persons (mean age:  $24.44 \pm 5.72$  years) with impacted teeth, 74 were females (mean age:  $23.96 \pm 6.03$  years) and 61 males (mean age:  $25.04 \pm 5.14$  years). No statistically significant difference was found between the mean age of entire group, female

and male persons with and without impacted teeth with P values found as  $P = 0.07$ ,  $P = 0.4$  and  $P = 0.23$ ; respectively (Table 1).

Impacted teeth were detected in 4.84% of the female individuals and 5.32% of the male individuals. There was no statistically significant difference between the genders in terms of the incidence of impacted teeth ( $P = 0.54$ ). A total of 167 impacted teeth were found in 135 persons. Only one tooth in 104 persons (3.88%), two teeth in 30 persons (1.12%), and three teeth in only one person (0.03%) were evaluated as impacted teeth (Table 2).

**Table 2** Distribution of impacted teeth

Impacted teeth number	Patient number	Total Impacted teeth (%)
1	104	104 (62.2%)
2	30	60 (35.9%)
3	1	3 (1.7%)
<b>Total</b>	<b>135</b>	<b>167 (100%)</b>

**Table 1** Distribution of gender and mean age in the study population

	Impacted teeth (+)	Impacted teeth (-)	All group	P value +
<b>Patient number</b>	135	2539	2674	
All group				
% within	100%	100%	100%	< 0.05
Female				
% within	74	1454	1528	<0.05
	54%	57.3%	57.2%	
Male				
%within	61	1085	1146	<0.05
	46%	42.7%	42.8%	
<b>Age</b>	<b>Mean <math>\pm</math> SD</b>	<b>Mean <math>\pm</math> SD</b>	<b>Mean <math>\pm</math> SD</b>	
All group	$24.44 \pm 5.72$	$24.65 \pm 5.61$	$25.05 \pm 5.68$	0.07
Female	$23.96 \pm 6.03$	$24.22 \pm 6.94$	$24.08 \pm 6.57$	0.4
Male	$25.04 \pm 5.14$	$27.29 \pm 4.34$	$26.36 \pm 4.59$	0.23

SD: Standard deviation, + Chi-square test

The most common impacted teeth were found in the maxillary canine teeth (62.8%) followed by the secondary premolar teeth (14%). Of the total 167 impacted teeth, 126 (75.4%) were localized in the maxilla and 41 (24.6%) in the mandible (Table 3).

When localization of the teeth impacted in the right and left sides was examined; no statistically significant difference was found between the two sides in the maxilla ( $P = 0.08$ ), but a statistically significant difference was observed between the right and left sides in terms of the incidence of impacted teeth ( $P = 0.007$ ). Number and percent distribution of the right- and left-sided impacted teeth in the maxilla and mandible are shown in Table 3.

## Discussion

In this study, impacted teeth were found in 135 of 2674 persons (5.04%). In their studies, Ezoddini et al. (13) found the incidence of impacted teeth as 8.3% in 480 patients, and Chu et al. (8) as 28.3% in 7486 patients. However, the third molar teeth were included in both studies. Since the third molar teeth are the most commonly impacted teeth, the incidence of impacted teeth might be found high in the studies including these teeth.

In the present study, the third molar teeth were not included, and the most common impacted teeth were found as maxillary canine teeth (62.8%) (105 teeth, 101 patients). Evaluating these patients, a single maxillary canine teeth were found to be impacted in 97 persons and both maxillary canines in 4 patients.

The prevalence of impacted teeth was found as 3.9% in the maxillary canine teeth. Chu et al. (8) found the incidence of impacted maxillary canine teeth as 0.8%. One impacted maxillary canine tooth was found in 14 patients with a prevalence of 0.5%. The incidence of mandibular impacted teeth was similar with the literature. Impacted mandibular impacted teeth was found as 1.29% by Yavuz et al. (14), 0.22% by Grover and Lorton (15), and 1.36% by Sanu et al. (16). Fibrous dysplasia should be kept in mind in the differential diagnosis of impacted mandibular teeth. In the present study, maxillary canine teeth remained more commonly impacted by seven folds of the mandibular canine teeth. This is consistently with the results of other studies in the literature (8).

The most common impacted teeth following the third molar teeth were respectively maxillary canines, mandibular canines, mandibular and maxillary premolars, and maxillary middle incisors, consistently with the previous studies (8, 12). In our study, the incidence of impacted teeth in the maxilla was higher by about three times than the mandible (Table 3). This result was similar to the results of the studies by Shah et al. (9), and Brown et al. (6). Whereas similar rate of impacted teeth was found in the maxilla, impacted canine teeth were more common in the right side in the mandible.

In this study, no statistically significant difference was found between female and male persons in terms of the prevalence of impacted teeth ( $P = 0.54$ ). Whereas Kramer et al. (11) and Schersten et al. (7) found no difference between the genders in terms of the

**Table 3** Distribution of impacted teeth in the upper and lower jaws in the right and left regions

	Santral 1 incisor	Lateral incisor	Canin	1.premolar	2.premolar	1. molar	2.molar	All group
Right	3	-	53	-	5	1	1	63
Left	1	-	52	-	7	-	3	63
Maxilla	2.3%		62.8%		7.18%	0.59%	2.3%	126 75.4%
Right	-	1	12	3	5	-	7	28
Left	-	-	2	-	7	-	4	13
Mandible	-	0.59%	8.38%	1.7%	7.18%	-	6.58%	41 24.5%
All group	4 2.4%	1 0.59%	119 71%	3 1.7%	24 14.3%	1 0.59%	15 8.98%	167 100%

prevalence of impacted teeth; Rozsa et al. (12) and Dural et al. (17) reported higher incidence of impacted teeth in female persons.

Impacted teeth are frequently asymptomatic, while pain, swelling, chronic infection, and fistulization may be observed based on the localization (14). In addition, cystic lesions may accompany in the teeth impacted in the maxilla and mandible. Recommendation for the impacted teeth include radiological follow-up at certain intervals, surgical extraction, and bringing to the normal localization with orthodontic therapy (14). The impacted canine teeth can be followed-up in case of asymptomatic conditions, advanced age, clinical conditions that are not eligible for surgical treatment, and rejection of the surgical operation by the patient. Whereas the previous studies included the third molar teeth, in this study we did not include these teeth. Therefore, 62.8% of the teeth considered as impacted were determined as the maxillary canine teeth. The rate of impaction was found as 8.38% in the mandibular canine teeth. After the maxillary and mandibular canine teeth, maxillary and mandibular second molar teeth were observed by 7.18%. Unlike the other studies, the second premolar teeth were followed by the mandibular second molar teeth by 6.58%. No impacted tooth was detected among the mandibular lateral incisors and first premolar teeth, and maxillary central incisors and first molar teeth (Table 3).

## Conclusion

The third molar teeth were not included in this study, and maxillary canine teeth were found as the most common impacted teeth. The incidence of impacted teeth was higher by about 3 times in the maxilla than in the mandible. No difference was found between male and female persons in terms of the incidence of the impacted teeth.

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