

## A Retrospective Panoramic Radiographic Study on Prevalence of Impacted Teeth in South Karnataka Population

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### Abstract

**Objective:** The present panoramic radiographic study was done to investigate the prevalence of impacted teeth excluding third molars in South Karnataka population.

**Materials and methods:** This retrospective study evaluated 1050 panoramic radiographs of patients of South Karnataka population who reported to the Department of Oral Medicine and Radiology, K.V.G. Dental College, Sullia. Panoramic radiographs were examined for the presence of impacted teeth including the supernumerary teeth.

**Results:** At least one impacted teeth was noted in 4.8% of patients. Most common impacted teeth in our study were maxillary canines (2.66%), followed by impacted supernumerary teeth (1.42%). The incidence of impacted premolars and incisor were comparatively lower (0.85% and 0.28% respectively).

**Conclusion:** Impaction is a common dental anomaly, though the incidence can vary in different population. Knowledge about the prevalence can be helpful in treatment aspect and can be used as a valuable forensic tool.

**Keywords:** Prevalence; Supernumerary teeth; Impacted teeth

### Introduction

Impacted teeth are the teeth which are completely unerupted, retained or partially erupted based on the clinical and radiographic assessment [1]. It is a common dental anomaly of the jaws [2]. The prevalence of impacted and supernumerary teeth has been the subject of various studies. Different populations and ethnic group were studied for the same to know the variation. The incidence of impacted teeth, excluding third molars, has been reported between 5.6 to 18.8% in various studies. There are no studies conducted in South Karnataka population to determine the prevalence of impacted teeth and present study is an attempt to know the prevalence of impacted and supernumerary teeth and thus to provide a forensic tool [3].

### Materials and Methods

Panoramic radiographs of 1050 patients reported to Department of Oral Medicine and Radiology, K.V.G Dental College were collected for the study. Digital panoramic radiographs were taken by using Planmeca Proline XC with Dimax 3 Digital X-ray unit system machine. Radiographs were examined to detect the presence of any impacted teeth except third molars. Study also included supernumerary teeth which are impacted. All radiographs were evaluated by two maxillofacial radiologists at the same time.

A tooth which is prevented from eruption due to physical barrier is considered to be impaction. It can also occur due to altered orientation of the tooth from normal. Tooth is considered as impacted when it remains in jaw even after 2 years of mean eruption time. A supernumerary tooth is the additional tooth which is either erupted or impacted. It can resemble or does not have similarity to particular tooth. Supernumerary teeth can cause malposition or uneruption of adjacent teeth.

Presence of impaction and tooth impacted were recorded. Presence and location of supernumerary teeth was also noted

### Results

Sample included 1050 panoramic radiographs of patients of age 16-

76 yrs of age with a mean age of 32 yrs. 450 males (42.86%) and 600 females (57.14%) were included. Prevalence of impacted teeth in our study was 4.8%. Prevalence of impacted teeth among males was 6.44%. Out of 450 male patients, 29 had impacted teeth. 20 males had at least one impacted tooth. Three had 2 impacted teeth, two males had 3, three males had 4 and one male had 5 impacted teeth. Prevalence among females was 3.5%. Out of 600 females 21 had impacted teeth. 13 females had at least one impacted teeth. Five had 2 impacted and three had 4 impacted teeth (Table 1).

Prevalence of canine impaction was 2.66% followed by impacted supernumerary teeth (1.42%) while the incidence of impacted premolars and incisor were substantially lower, 0.85% and 0.28% respectively (Table 2).

In males, prevalence of canine impaction was 52.5% and in females it was 47.5%. In case of incisor, it was 75% in males and 25% in females. Prevalence of 55.5% in males and 44.4% in females in case of premolars were noted. Supernumerary teeth prevalence was 64.51% and 35.48% in males and females respectively (Table 3). Distribution of impacted teeth was studied in the jaw. It was found that incisor impaction was seen only in maxilla. Canine impaction was seen in maxilla (77.5%) compared to mandible (22.5%), prevalence of premolar impaction was 22.2% in maxilla and 77.8% in mandible. Supernumerary teeth were common in mandible (61.29%) compared to maxilla (38.7%) (Table 4).

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SEX	Number of impacted teeth					Total	Prevalence
	1.00	2.00	3.00	4.00	5.00		
Male	20 (40.0%)	3 (6.0%)	2 (4.0%)	3 (6.0%)	1 (2.0%)	29 (58.0%)	6.44%
Female	13 (26.0%)	5 (10.0%)	0	3 (6.0%)	0	21 (42.0%)	3.5%
Total	33 (66.0%)	8 (16.0%)	2 (4.0%)	6 (12.0%)	1 (2.0%)	50 (100.0%)	4.8%

Table 1: Prevalence.

	Male	Female	Total number of patients	Prevalence
Incisor	2	1	3	0.28%
Canine	15	13	28	2.66%
Premolar	5	4	9	0.85%
Supernumerary	10	5	15	1.42%

Table 2: Distribution of patients according to gender and type of impacted teeth.

	Male	Female	Total
Incisor	3 (75.0%)	1 (25.0%)	4 (4.76%)
Canine	21 (52.5%)	19 (47.5%)	40 (47.6%)
Premolar	5 (55.55%)	4 (44.44%)	9 (10.71%)
Supernumerary	20 (64.51%)	11 (35.48%)	31 (36.90%)
Total	49 (58.33%)	35 (41.67%)	84 (100%)

Table 3: Distribution of impacted teeth according to gender.

	Maxilla	Mandible	Total
Incisor	4 (100%)	0	4 (4.76%)
Canine	31 (77.5%)	9 (22.5%)	40 (47.6%)
Premolar	2 (22.22%)	7 (77.78%)	9 (10.71%)
Supernumerary	12 (38.70%)	19 (61.29%)	31 (36.90%)
Total	49 (58.33%)	35 (41.67%)	84 (100%)

Table 4: Distribution of impacted teeth according to location.

## Discussion

The prevalence of impacted teeth, excluding third molars, has been reported to be 5.6 to 18.8% from literature review [2]. Our study evaluated 1050 patients and 50 patients had impacted teeth and prevalence calculated was 4.8%. Review of literature showed variable results in different population. Study by Ahlqwist et al. showed prevalence of 8.3% (117/1418). Aitasalo et al., noted 14.1% (571/4063), Alattar et al., 22.3% (1512/6780), Brown et al., 30.8%, (583/1895), Dachi et al., 16.7% (281/1685), Eliasson et al., 30.3% (644/2128), Haidar et al., 32.3% (323/1000), Hattab et al., 33.6% (78/232) and study by Hugoson et al., reported 37.8% (262/693). Study by Kramer et al., reported prevalence of 18.3% (684/3745), Mead 18.9% (276/1462) Peltola 76.6%(787/1027), Sandhu and Kapila, 26.0% (264/1015), Schersten et al., 33.5% (86/257), Shah et al., 6.9% (546/7886), Stanley et al., 15.1% (1756/11598), Stermer Beyer-Olsen et al., 15.6% (22/141)Yamaoka et al., 8.5% (155/1834) [3].

Our data shows the incidence of tooth impaction to be 4.8%, and this is slightly lower than the range of 5.6-18.8% reported in other studies. One of the reasons may be exclusion of impacted third molar from our study.

Also there may be variation in the study design which in turn influences the result. Methodology, sample selection, definition of impacted tooth and the age group of subjects studied are few other factors for the variable results. A randomized and representative sample of the general population is necessary for obtaining the proper result. While doing this, certain things are compromised, as exposing patients to unnecessary radiation for research purposes may not support the ethics. One practical approach is evaluation of radiographs from specific

populations, though it inevitably has the risk of bias in the information.

We found that canines were the most commonly impacted teeth, as in agreement with other studies. Impacted canine was found in 2.66% of cases in our study. Aydin et al. reported an incidence of 3.58% [4]. 3.6% had at least one impacted cuspid in another report by Zahrani et al., [5]. Another study reported 101 cases of impacted cuspids constituting 5.43%. It was noted that the frequency of impacted canines was dependent on the population studied. Also it was noted that impacted canine were located more commonly in maxilla [6].

From the limited information available regarding impacted premolars it was noted that impaction was in the range of 2.1-2.7% [7,8]. Our results showed 0.85% premolar impaction.

The literature review of impacted molars demonstrates that this is a very rare dental abnormality, which is consistent with the low incidence found in the present study. Increased percentage of impaction was noted in males as in other studies which could be due to the genetic component [9]. Depending on the studies conducted prevalence of supernumerary teeth vary between 0.1-3.8% of population [10]. Our study showed a prevalence of 1.2% which is within this range. As in our study, many studies showed slightly higher prevalence of supernumerary teeth in males. The major part of supernumerary teeth found in the present study was noticed in the mandibular premolar region, maxillary pre molar region followed by maxillary incisor region. Luten's study showed prevalence of supernumerary teeth in the order of upper lateral incisors, mesiodens, upper central incisors followed by mandibular bicuspid [11]. Also study done in Mexican population suggested that mesiodens was the most common supernumerary, followed by premolars, lateral incisors and 4th molars [12].

## Conclusion

Impaction of teeth is one of the common dental anomalies reported. Results of our study on impacted teeth were similar in certain aspect of the data when compared to the published literature. A low prevalence of impacted teeth was noted in our study. Racial and genetic features can be an attributed factor in the difference of the results. This suggests a fact that population based studies are valuable and adds new data to the forensic odontology field.

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