# A Retrospective Comparative Study of Cone-Beam Computed Tomography versus Rendered Panoramic Images in Identifying the Presence, Types and Characteristics of Dens Invaginatus in Patients presenting to Qassim university.


Abstract

Background: Dens invaginatus is also termed as “Dens in Dente”. It is a rare developmental anomaly with a wide variety of morphological types. The invagination starts in the crown and it may extend into the root. The aim of the current study was to investigate the presence, type and characteristics of DI in full-mouth surveys in Saudi patients presenting to Qassim dental college by using CBCT and panoramic images rendered from CBCT scans and to compare the findings of the imaging techniques.

Methods: This retrospective study was performed by using 302 previously obtained CBCT records of patients from the database of the oral and maxillofacial radiology department of Qassim University, Saudi Arabia from yer 2016 to 2021. The research was ethically approved by the ethical approval committee of Qassim university (Code #: F-2019-3005).

Results: In the present study, the age of the patients ranged from 9 to 80 years (mean age was 44 years). Out of 302 scans, 153 patients were female, and 149 were found to be male. According to the Cohen kappa test, the inter-examiner agreement was high between the 2 assessments of the observers: k = 0.795, P < .000 for CBCT and k = 0.915, P < .000 for panoramic images rendered from CBCT images. On the basis of the CBCT images, DI was observed in 98 of the 302 patients (frequency, 32.5%). Type I DI was the most commonly observed type of invaginatus (93.9%), followed by type II (6.1%). However, type III was not being observed.

Conclusion: We can conclude that there is no special relation between gender and dens invagnatus existence. CBCT images are superior to rendered panoramic images in diagnosing and classifying dens invaginatus. CBCT can be recommended as an effective diagnostic device for identifying DI because it provides an accurate representation of the external and internal dental anatomy as well as appropriate visualization of associated characteristics with such cases that would be absolutely necessary in their treatments phases.

## Introduction:

Dens invaginatus is also termed as "Dens in Dente". It is a rare developmental anomaly with a wide variety of morphological types. The invagination starts in the crown and it may extend into the root. As a result, the affected teeth show deep infolding of the enamel into dentine which creates a pocket of organic material underneath the enamel surface. Therefore, it is easier for bacteria from the oral cavity to contaminate and propagate within these malformations, leading to the development of early caries and consequently pulp necrosis. Although, these lesions are usually formed under the palatal pit or cusp tip, they can be extensive and grossly distort the anatomy of the root canal system. It can occur in any tooth in both arches but it mostly affects Maxillary lateral incisors followed by central incisors, premolars, canines and less often the molars. Also, DI lesions are rare in Mandibular teeth and bilateral occurrence is common. [1,2,3,4,5,6]

It may be found in association with other dental anomalies such as Microdontia, Macrodontia, Hypodontia, Oligodontia, Taurodontism, Gemination , Fusion, Supernumerary teeth , Amelogenesis imperfecta , Invagination in an odontome , Multiple odontomes, Coronal agenesis and William's syndrome. In addition to the dental anomalies that might be present with the DI there is high percentage of Periapical lesions, open apices as well as impaction near the DI affected tooth. [(7)] The etiology of DI is controversial and remains unclear. Many theories have been proposed. However according to the most widely accepted theory, it is caused by invagination of the enamel into the adjacent dental papilla during tooth development resulting in a deep invagination of the enamel organ into the dental papilla prior to calcification of the dental hard tissues. The other possible factors responsible are external forces on the tooth germ during odontogenesis, adjacent tooth germs, Fusion of tooth germs, Infection, Trauma, Growth pressure on the dental arches during odontogenesis causing infolding of the enamel. (7)

Since, the knowledge of classification and anatomical variations of teeth with DI is of utmost importance for correct diagnosis and management, different classification systems have been suggested for it. The most frequently used is proposed by Oehlers, possibly because of its simple nomenclature and ease of application. This system categorizes invaginations into three different types according to the depth of invagination seen radiographically from the crown into the root. (8) Although DI is a common condition it might be easily overlooked and ignored by many clinicians because of absence of any significant clinical signs and symptoms. It is usually noticed accidentally by routine radiographs. However, some patients may complain of an unusual shaped tooth. If DI is left undiagnosed, affected teeth may develop caries and peri-radicular pathosis and eventually can lead to tooth loss. Thus, the early detection of DI affected teeth will not only provide a better prognosis for these teeth but will also obviate the need for complex and difficult endodontic procedures later in life. (6) DI can be recognized on almost all types of dental X-rays, but conventional radiographs are not sufficient as they give only a 2D view of a complex anatomy. In addition to this there are other factors that can affect the diagnosis of DI, such as 3-dimensional vision, qualities of the radiographs taken and clinician's own experience.

Recently, cone-beam computed tomography (CBCT) has been globally introduced to check and evaluate the coronal and radicular morphologies of the teeth to detect any abnormalities. Undoubtedly, the CBCT is a powerful tool for a dentist to use as it is considered as non-invasive method and provides 3D images for endodontic and surgical applications and morphologic analysis of anomalies for the clinicians. (9) Many studies have evaluated the prevalence of DI by using the conventional periapical and the panoramic (OPG) radiographs but unfortunately these two methods are considered limited in identifying the exact type and related characteristics in association with DI. Nevertheless, CBCT examination has the advantage to overcome all of these shortcomings. (10.11)

The reported prevalence of teeth affected by DI worldwide is in a range between 0.04 to 10% in the general population (8) Different studies have been conducted regarding the prevalence of DI in Saudi Arabia and it was found to be 1.7% out of 1581 patients examined in full mouth surveys. However, in another study it was 0.6% out of 990 patients examined using radiographs. (12) Up till now, no such studies have been conducted regarding the prevalence of DI in Al-Qassim region.

Therefore, the aim of the current study was to investigate the presence, type and characteristics of DI in full-mouth surveys in Saudi patients presenting to Qassim dental college by using CBCT and panoramic images rendered from CBCT scans and to compare the findings of the imaging techniques.

## Materials and Methods:

### Study design and setting

This retrospective study was performed by using 302 previously obtained CBCT records of patients from the database of the oral and maxillofacial radiology department of Qassim University, Saudi Arabia from yer 2016 to 2021. The research was ethically approved by the ethical approval committee of Qassim university (Code #: F-2019-3005).

### Data collestoin

All of the images were obtained with a Galileos Sirona machine (Germany) FOV:17X17cms. CBCT images were randomly selected from the database of the oral and maxillofacial radiology department that were taken as a routine part of dental examination for diagnosis and treatment planning purposes. The acquisition process was performed by an experienced radiologist according to the manufacturer's recommended protocol, and the minimum exposure time necessary for adequate image quality was usedWith this device, tube potential and tube current were automatically determined from scout views by the CBCT machine. All of the oro-dental, medical history (syndromes and systemic diseases), and demographic characteristics of the patients were obtained in a standardized way from the clinical records.

### Eligibility criteria

Exclusion criteria included poor quality CBCT images, the absence of all teeth, and incomplete records. The CBCT images of the 302 patients who met the inclusion/exclusion criteria were analyzed with Galileos viewer 2010 software by using a HP laptop on windows 10.

### Data analysis

The age and gender of the patient as well as the presence of systemic diseases and syndromes were noted. For each patient, the settings for the program was adjusted on U shaped. After processing, the axial, cross-sectional, multiplanar reformat and 3D reformat images of the patients were carefully evaluated to determine the existence of DI, it's type, and associated dental anomalies such as open apex, periapical pathosis, and the presence of any bony impaction of an adjacent tooth that was compromised because of the pathosis or condition of the DI tooth. DI was classified according to the Oehlers classification system. The CBCT and panoramic images rendered from CBCT images of the patients were examined by 2 experienced endodontists and in cases where a consensus was not reached, an oral radiologist with 7 years of experience in CT and CBCT was asked to perform a decisive evaluation. The interexaminer reliability between the 2 observers was calculated by using the Cohen kappa test. Statistical evaluation of the presence of DI related to age and gender was performed by using the Pearson correlation and the $X^2$ test. The McNemar test was employed to compare presence and type of DI according to CBCT and panorex images.

## Results

In the present study, the age of the patients ranged from 9 to 80 years (mean age was 44 years). Out of 302 scans, 153 patients were female, and 149 were found to be male. According to the Cohen kappa test, the inter-examiner agreement was high between the 2 assessments of the observers: k = 0.795, P < .000 for CBCT and k = 0.915, P < .000 for panoramic images rendered from CBCT images. On the basis of the CBCT images, DI was observed in 98 of the 302 patients (frequency, 32.5%). Type I DI was the most commonly observed type of invaginatus (93.9%), followed by type II (6.1%). However, type III was not being observed.



Table 1. Data statistics

| Presence & Type | | | Gender: | | Total | P-Value |
|---|---|---|---|---|---|---|
| | | | Male | Female | | |
| | Type I | Count | 51 | 41 | 92 | 0.409 |
| | | % of Total | 52.0% | 41.8% | 93.9% | |
| | Type II | Count | 2 | 4 | 6 | |
| | | % of Total | 2.0% | 4.1% | 6.1% | |
| Total | | Count | 53 | 45 | 98 | |

| | | | | | |
|---|---|---|---|---|---|
| | % of Total | 54.1% | 45.9% | 100.0% | |

Table 2. Presence & Type (CBCT)

| Presence & Type (CBCT) | Male | Female | Total | **P-value** |
|---|---|---|---|---|
| **Type I** | 51 (52%) | 41 (41.8%) | 92 (93.9%) | |
| **Type II** | 2 (2%) | 4 (4.1%) | 6 (6.1%) | 0.409 |
| **Total** | 53 (54.1%) | 45 (45.9%) | 98 (100%) | |



DI was seen in 45 women (46%) and in 53 men (54%). No associations with gender and age were detected (P > .409).

Table 3. Gender wise variability

| Type | | Gender: | | Total | P – Value |
|---|---|---|---|---|---|
| | | Male | Female | | |
| Not Visible | Count | 36 | 21 | 57 | 0.041 |
| | % of Total | 36.7% | 21.4% | 58.2% | |

| | | | | | |
|---|---|---|---|---|---|
| Type I | Count | 17 | 24 | 41 | |
| | % of Total | 17.3% | 24.5% | 41.8% | |
| Total | Count | 53 | 45 | 98 | |
| | % of Total | 54.1% | 45.9% | 100.0% | |

Table 4. Data variability

| Presence & Type (OPG) | Male | Female | Total | **P-value** |
|---|---|---|---|---|
| **Not Visible** | 36 (36.7%) | 21 (21.4%) | 57 (58.2%) | |
| **Type I** | 17 (17.3%) | 24 (24.5%) | 41 (41.8%) | 0.041 |
| **Total** | 53 (54.1%) | 45 (45.9%) | 98 (100%) | |

On the basis of the panoramic images rendered from CBCT images, DI was observed in only 41 of the total 302 patients (frequency 13.6%). P-value =0 .041 which is significant. Which means the cases has been diagnosed with the panoramic images alone is lesser than the full views of CBCTs. Only type I has been found.

Table 5. Affected teeth

| Affected teeth | | Gender : | | Total | P – value |
|---|---|---|---|---|---|
| | | Male | Female | | |
| Unilateral | Count | 12 | 9 | 21 | P = 0.809 |

| | | | | | |
|---|---|---|---|---|---|
| | % of Total | 12.2% | 9.2% | 21.4% | |
| Bilateral | Count | 41 | 36 | 77 | |
| | % of Total | 41.8% | 36.7% | 78.6% | |
| Total | Count | 53 | 45 | 98 | |
| | % of Total | 54.1% | 45.9% | 100.0% | |

Table 6. data statistics

| Affected teeth | Male | Female | Total | **P-value** |
|---|---|---|---|---|
| **Unilateral** | 12 (12.2%) | 9 (9.2%) | 21 (21.4%) | |
| **Bilateral** | 41 (41.8%) | 36 (36.7%) | 77 (78.6%) | 0.809 |
| **Total** | 53 (54.1%) | 45 (45.9%) | 98 (100%) | |



Bilateral DI was found in 78.6% (77) of the total affected patients, out of which 41.8% were males and 36.7% were females. Since P value = 0.809 so association between distribution of teeth and gender is non-significant. Bilateral DI was found in 77 of the affected patients. The distribution, type and associated anomalies of the teeth are shown in . DI was not observed in the molar teeth. The teeth most commonly affected were Lateral incisors , followed by Central incisors Furthermore, no periapical lesions were evident like open apices or apical pathosis in teeth with DI.

Table 7. apical pathosis

| Characteristics | Gender : | Total | P- |
|---|---|---|---|

| | | Male | Female | | Value |
|---|---|---|---|---|---|
| None has been noticed | Count | 39 | 35 | 74 | |
| | % of Total | 39.8% | 35.7% | 75.5% | |
| Impaction | Count | 9 | 5 | 14 | |
| | % of Total | 9.2% | 5.1% | 14.3% | |
| Dilacerations | Count | 3 | 1 | 4 | |
| | % of Total | 3.1% | 1.0% | 4.1% | |
| Calcification / Pulpal stones | Count | 1 | 2 | 3 | 0.407 |
| | % of Total | 1.0% | 2.0% | 3.1% | |
| Mesiodens | Count | 1 | 0 | 1 | |
| | % of Total | 1.0% | 0.0% | 1.0% | |
| Caries | Count | 0 | 2 | 2 | |
| | % of Total | 0.0% | 2.0% | 2.0% | |
| Total | Count | 53 | 45 | 98 | |

| | | | | | |
|---|---|---|---|---|---|
| | % of Total | 54.1% | 45.9% | 100.0% | |

Table 8. Data statistics

| Characteristics | Male | Female | Total | **P-value** |
|---|---|---|---|---|
| None has been noticed | 39 (39.9%) | 35 (35.7) | 74 (75.5%) | |
| Impaction | 9 (9.2%) | 5 (5.1%) | 14 (14.3%) | |
| Dilacerations | 3 (3.1%) | 1 (1%) | 4 (4.1%) | |
| Calcifications / pulpal stones | 1 (1%) | 2 (2%) | 3 (3.1%) | 0.407 |
| Mesiodens | 1 (1%) | 0 | 1 (1%) | |
| Caries | 0 | 2 (2%) | 2 (2%) | |
| **Total** | 53 (54.1%) | 45 (45.9%) | 98 (100%) | |

An impacted tooth was found near the tooth with DI in about 14.3% of the patients, **whereas** 8.2% of the patients had other anomalies h such as Dilacerations, calcification, pulpal stones, mesiodens and supernumerary teeth. However, no associated systemic diseases or syndromes were detected. Without any doubt there wasn't a clear view for associated characteristics except for impactions using rendered panoramic images . The p-value is .407 which is non significant.

Table 9 Cone beam computed tomography

| Cone beam computed tomography | Panoramic : | Total | P-Value |
|---|---|---|---|

| | | Not Found | Found | | |
|---|---|---|---|---|---|
| Not Found | Count | 2 | 0 | 2 | P = 0.000 |
| | % of Total | 2.0% | 0.0% | 2.0% | |
| Found | Count | 55 | 41 | 96 | |
| | % of Total | 56.1% | 41.8% | 98.0% | |
| Total | Count | 57 | 41 | 98 | |
| | % of Total | 58.2% | 41.8% | 100.0% | |



Table 10. Data statistics

| CBCT | OPG | | Total | P-Value |
|---|---|---|---|---|
| | Not Found | Found | | |
| **Not Found** | 2 (2%) | 0 (0%) | 2 (2%) | P = 0.000 |
| **Found** | 55 (56.1%) | 41 (41.8%) | 96 (98%) | |
| **Total** | 57 | 41 | 98 | |

| | | | |
|---|---|---|---|
| | (58.2%) | (41.8%) | (100%) |

According to the McNemar test, DI detection was lower on panoramic images rendered from CBCT images (41.8%) compared with on CBCT images (56.1.7%) (P < .000). All Panoramic images shows only type I DID.



# Discussion

Early detection of DI is critical to avoiding the need for complicated and difficult endodontic operations later in life. The prevalence of teeth impacted by DI has been observed to range from 0.3 percent (21) to 12 percent (13-18). The vast range of reported prevalences might be explained by the diverse cohorts analyzed, differences in the diagnostic procedures utilized, and diagnostic challenges (14). DI was found in 10.7% of the patients in our investigation, which is comparable with the findings of Kirzioglu and Ceyhan (18) in their study of Turkish dental patients.

DI was shown to be present in 1.3 percent, 2.95 percent (22), and 2.5 percent (17) of Turkish dental patients in investigations employing panoramic radiography. This study's modest panoramic prevalence (3.3%) was within the range previously described in the literature. The increased frequency of DI identified in the current study using this approach might be explained by the fact that CBCT gives an accurate picture of the exterior and interior anatomy.

Other dental anomalies such as taurodontism, microdontia, gemination, and dentinogenesis imperfecta may be linked to the formation of symmetric DI (23, 24). In this research, 31.3 percent of DI cases were bilateral, with some individuals having additional dental abnormalities (Table 1). Several earlier research that looked at the prevalence of DI revealed DI in the maxillary incisors but not the mandibular incisors (17, 18).

DI was found in the maxillary first premolars and third molars, as well as the maxillary incisors. DI was found in the maxillary incisors, maxillary canines, mesiodens, mandibular canines, and mandibular premolars in the current investigation. A PubMed search did not retrieve information related to screening studies on the prevalence of DI in mesiodens.

However, mesiodens DI has been documented (25, 26). In a study of the clinical relevance of DI (27) 11 individuals with DI of the mandibular teeth were found in the literature, one in a primary canine (28), and two in permanent canines (29). DI in the mandibular incisors (30), mandibular canines (31) and mandibular third molars (32) has been documented in several recent case reports (32).

The cause of DI is unknown, and a lot of ideas have been offered to explain it. DI, according to Kronfeld (33) is caused by the slowing of a focused set of cells while the surrounding cells continue to proliferate normally. DI, according to Atkinson (34) is caused by external factors acting on the tooth germ during development. In the current study, 11.6 percent of DI patients had an impacted tooth near the DI tooth, confirming Atkinson's idea. DI can happen in the coronal region of the tooth or in the root section on rare occasions (35). The Oehlers classification has been used in several investigations to evaluate the prevalence of each form of DI (17, 18), with type I being the most common.

In our study, type I invaginatus was the most prevalent kind of invaginatus (65.9%), similar to prior studies. Because the Oehlers categorization is based on a 2-dimensional (2D) radiography picture, it may underestimate the invagination's intricacy and genuine extent. In endodontic epidemiologic surveys and clinical outcome investigations, 2D radiographs gave insufficient information (15). This is the first research to detect the existence of DI using CBCT pictures. CBCT should be employed in larger research with larger study populations in the future. Diagnostic imaging may not correlate with the presence of DI histologically, which was one of the study's shortcomings.

As a result, future research should focus on determining the relationship between CBCT imaging and histologic sections. Despite the benefits of CBCT scanning for root canal anatomy studies, current recommendations state that the choice to employ CBCT scanning should be based on whether the benefits justify the danger of the considerably greater radiation dosage of CBCT compared to traditional radiography (36). As a result, when conventional imaging fails to offer defining information on complicated endodontic diseases, CBCT should be used sparingly (36). We employed CBCT pictures that had previously been taken for a variety of objectives, including implant placement, surgical planning, and orthodontic therapy, among others, in the current investigation.

## Conclusion

We can conclude that there is no special relation between gender and dens invagnatus existence. CBCT images are superior to rendered panoramic images in diagnosing and classifying dens invaginatus. CBCT can be recommended as an effective diagnostic device for identifying DI because it provides an accurate representation of the external and internal dental anatomy as well as appropriate visualization of associated characteristics with such cases that would be absolutely necessary in their treatments phases.

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***TABLE 1. Distribution, Type, and Conditions of Teeth with DI***

| Patient | Age | Gender | Year | Tooth | Oehlers type (CBCT) | Oehlers type (Panorama) | Impaction of tooth near DI | Dental anomaly |
|---|---|---|---|---|---|---|---|---|
| 1.(1061) | 34 | M | 2018 | #22 Unilateral | Type I | Not visible | - | - |
| 2. (214) | 31 | F | 2018 | #12 #11 #21 #22 Bilateral | Type I | Type I | #23 unilateral impaction | - |
| 3. (227) | 43 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 4. (349) | 29 | M | 2017 | #22 Unilateral | Type I | Not visible | - | Dilacerations in #23 |
| 5. (470) | 60 | F | 2018 | #12 Unilateral | Type I | Not visible | - | - |
| 6. (1089) | 59 | F | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 7. (1122) | 51 | F | 2018 | #12 #11 #21 #22 Bilateral | Type II | Type I | - | - |
| 8. (1223) | 26 | M | 2018 | #12 #11 #21 #22 #23 | Type I | Not visible | - | - |
| 9. (1973) | 48 | F | 2018 | #12 Unilateral | Type I | Not visible | - | - |
| 10. (4000) | 36 | M | 2017 | #22 Unilateral | Type I | Not visible | #23 unilateral | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | canine impaction almost horizontal | |
| 11. (4444) | 45 | F | 2016 | #12 #22 Bilateral | Type I | Type I | - | - |
| 12. (4944) | 47 | M | 2018 | #12 #22 Bilateral | Type II | Not visible | - | Dilacerations |
| 13. (5186) | 20 | F | 2017 | #12 #22 Bilateral | Type II | Not visible | Lower canine impaction #45 | - |
| 14. (5224) | 37 | F | 2017 | #12 #11 #22 #21 Bilateral | Type I | Type I | - | - |
| 15. (5519) | 44 | M | 2017 | #12 #22 Bilateral | Type II | Type I | - | - |
| 16. (6007) | 29 | M | 2017 | #22 Unilateral | Type I | Not visible | - | - |
| 17. (6049) | 42 | F | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 18. (6131) | 36 | F | 2017 | #12 #11 #21 #22 #23 | Type I | Type I | - | Slight calcifications in one of the canals |
| 19. (6231) | 37 | F | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20. (6273) | 31 | F | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 21. (6675) | 23 | F | 2018 | #12 Unilateral | Type I | Not visible | - | - |
| 22. (6876) | 31 | F | 2018 | #12 Unilateral | Type I | Not visible | - | - |
| 23. (6985) | 56 | F | 2018 | #12 #11 #21 #22 Bilateral | Type I | Not visible | - | - |
| 24. (7456) | 33 | F | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 25. (7461) | 49 | F | 2018 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | #22 canal has a stone |
| 26. (7544) | 23 | F | 2018 | #12 Unilateral | Type I | Type I | - | - |
| 27. (7643) | 25 | F | 2018 | #12 #22 Bilateral | Type I | Type I | #23 canine impaction | - |
| 28. (7700) | 43 | F | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 29. (10823) | 37 | F | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 30. (11009) | 53 | M | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 31. (11134) | 27 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | #13 canine impactions | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 32. (12012) | 26 | M | 2018 | #12 #11 #21 #22 Bilateral | Type I | Not visible | - | - |
| 33. (12154) | 46 | F | 2017 | #12 Unilateral | Type I | Not visible | - | - |
| 34. (12627) | 35 | M | 2017 | #12 Unilateral | Type I | Not visible | - | - |
| 35. (12968) | 36 | M | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 36. (12978) | 35 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 37. (13366) | 34 | M | 2017 | #12 #11 #21 #22 Bilateral | Type I | Not visible | - | - |
| 38. (13702) | 26 | M | 2017 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 39. (13725) | 33 | M | 2017 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | Dilacerations #12 #22 |
| 40. (13760) | 26 | M | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 41. (14192) | 50 | M | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 42. (14849) | 25 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | #21 impaction | - |
| 43. (15249) | 36 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 44. (15648) | 29 | M | 2018 | #12 #22 Bilateral | Type I | Type I | - | - |
| 45. (15664) | 49 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 46. (15776) | 25 | M | 2017 | #22 Unilateral | Type I | Not visible | Bilateral upper canine impaction | - |
| 47. (15893) | 27 | M | 2018 | #12 #22 Bilateral | Type I | Not visible | - | Calcification in #21 canal |
| 48. (16006) | 26 | M | 2017 | #13 #12 #11 #21 #22 #23 | Type I | Type I | - | - |
| 49. (16108) | 29 | M | 2017 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 50. (16419) | 42 | M | 2018 | #12 #11 #21 #22 Bilateral | Type I | Not visible | - | Mesiodens |
| 51. (16429) | 9 | M | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 52. (16464) | 30 | M | 2017 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 53. (14041) | 36 | M | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 54. (7813) | 26 | F | 2020 | #12 #22 Bilateral | Type I | Type I | - | Dilacerations |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 55. (6065) | 40 | F | 2020 | #12 #22 Bilateral | Type I | Type I | - | - |
| 56. (6873) | 34 | F | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 57. (129) | 36 | F | 2019 | #12 #22 Bilateral | Type I | Type I | #23 canine unilateral impaction | - |
| 58. (6438) | 44 | F | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 59. (7029) | 32 | F | 2019 | #12 #22 Bilateral | Type I | Not visible | #23 unilateral canine impaction | - |
| 60. (6877) | 31 | F | 2019 | #12 #22 Bilateral | Type II | Type I | - | - |
| 61. (7106) | 21 | F | 2019 | #13 #12 #11 #21 #22 #23 | Type I | Not visible | - | - |
| 62. (20329) | 50 | F | 2019 | #11 #21 Bilateral | Type I | Not visible | - | - |
| 63. (6943) | 37 | F | 2019 | #22 Unilateral | Type I | Type I | - | - |
| 64. (7995) | 21 | F | 2018 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 65. | 22 | F | 2020 | #13 #12 #11 | Type I | Type I | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (8561) | | | | #21 #22 #23 | | | | |
| 66. (7820) | 33 | F | 2020 | #12 #22 Bilateral | Type I | Type I | - | - |
| 67. (8288) | 42 | F | 2020 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 68. (7296) | 67 | F | 2020 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 69. (7016) | 50 | F | 2019 | #12 #22 Bilateral | Type I | Type I | - | - |
| 70. (6657) | 62 | F | 2019 | #22 Unilateral | Type I | Type I | - | - |
| 71. (7373) | 23 | F | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 72. (5972) | 28 | F | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 73. (6856) | 42 | F | 2019 | #22 Unilateral | Type I | Not visible | - | - |
| 74. (5120) | 34 | F | 2019 | #12 #22 Bilateral | Type I | Type I | - | - |
| 75. (20393) | 22 | F | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 76. (8315) | 15 | F | 2020 | #12 #11 #21 #22 Bilateral | Type II | Type I | - | Severe invagination in both laterals |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 77. (948) | 25 | M | 2019 | #13 #12 #11 #21 #22 #23 | Type I | Type I | - | - |
| 78. (5409) | 44 | M | 2019 | #12 #21 #22 | Type I | Not visible | - | - |
| 79. (4322) | 25 | M | 2019 | #12 #21 #22 | Type I | Type I | - | - |
| 80. (4720) | 37 | M | 2019 | #12 #23 | Type I | Not visible | - | - |
| 81. (4248) | 27 | M | 2019 | #12 #22 Bilateral | Type I | Not visible | #13 impaction | #22 missing |
| 82. (6342) | 26 | M | 2019 | #12 #22 Bilateral | Type I | Type I | - | - |
| 83. (5593) | 37 | M | 2020 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 84. (5592) | 26 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 85. (2363) | 27 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 86. (2161) | 23 | M | 2019 | #12 #11 #21 | Type I | Type I | - | - |
| 87. (5864) | 41 | M | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 88. (1205) | 26 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 89. (5794) | 25 | M | 2019 | #12 #22 Bilateral | Type I | Not visible | Impaction of #12 | Supernumerary tooth |
| 90. (419) | 55 | M | 2019 | #13 #12 #11 #21 #22 #23 | Type I | Not visible | Impaction of #23 | - |
| 91. (3740) | 57 | M | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 92. (5205) | 26 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Type I | - | - |
| 93. (7161) | 23 | M | 2019 | #12 #11 #21 | Type I | Type I | - | - |
| 94. (6180) | 20 | M | 2019 | #13 #23 Bilateral | Type I | Not visible | - | - |
| 95. (5327) | 45 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Not visible | - | - |
| 96. (6195) | 18 | M | 2019 | #12 #11 #21 #22 Bilateral | Type I | Not visible | #13 horizontally impacted | - |
| 97. (4248) | 27 | M | 2019 | #12 #22 Bilateral | Type I | Not visible | - | - |
| 98. (1136) | 54 | M | 2018 | #12 Unilateral | Type I | Not visible | - | - |