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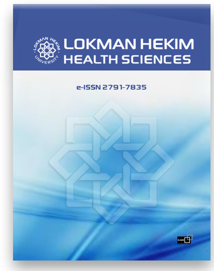

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Variations in the Indications for Cone-Beam Computed Tomography among Dental Departments

Şükran Ayran[1], Selma Ece Karabıyıkoğlu[1], Buğra Şenel[1], Barış Filiz Erol[2], Neşe Oral[3]

[1]Department of Oral and Maxillofacial Radiology, University of Health Sciences, Gülhane Faculty of Dentistry, Ankara, Türkiye
[2]Department of Prosthodontics, University of Health Sciences, Gülhane Faculty of Dentistry, Ankara, Türkiye
[3]Independent Dentist, Ankara, Türkiye

Abstract

Introduction: Cone-beam computed tomography (CBCT) has developed into the acknowledged standard for three-dimensional imaging of hard tissues in dentomaxillofacial radiology. CBCT should be utilized only in line with proper clinical indications due to the use of ionizing radiation in imaging. This study aims to analyze the purposes for CBCT requests in patients presented to the faculty of dentistry and to assess the compliance of these requests.

Methods: This retrospective study included the CBCT requests with documented clinical indications, obtained between January and December 2024 from eight clinical departments. Demographic data (age and sex), the requesting department, and the indication for imaging were analyzed. Statistical evaluation was performed using Chi-square and Fisher's exact tests to assess differences among departments and age groups, with a significance level set at $p<0.05$.

Results: A total of 1299 CBCT indications belonging to 1352 patients were evaluated in the study. It was determined that CBCT was most frequently requested for implant planning (54.3%), followed by lesion evaluation (16.4%) and impacted teeth (16.1%). The departments submitting the highest number of requests were oral and maxillofacial surgery (43.3%), periodontology (30.5%), and oral and maxillofacial radiology (12.2%), respectively. A statistically significant difference was observed in the distribution of CBCT request indications across clinical departments.

Discussion and Conclusion: CBCT requests are mostly oriented toward the indications specified by SedentexCT at the present time. However, more systematic approach to this issue and training of the personnel is recommended to avoid unnecessary radiation exposure.

Keywords: Cone-beam computed tomography; Dental implants; Radiation protection

Imaging methods play an important role in diagnosis and monitoring of oral diseases and treatment planning.[1] Conventional methods (panoramic, periapical radiography, etc.) can provide two-dimensional (2D) imaging and limitations such as magnification, superposition, artifact, and distortion are present in these methods. Remarkable progress has been made in the field of three-dimensional (3D) radiographic imaging (such as stereoscopy and computed tomography [CT]). However, its limited accessibility, high cost, and relatively high radiation dose levels have caused the limited use of CT in the dental field.[2]

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Correspondence: Selma Ece Karabıyıkoğlu. Sağlık Bilimleri Üniversitesi, Gülhane Diş Hekimliği Fakültesi, Ağız ve Çene Radyolojisi Anabilim Dalı, Ankara, Türkiye
E-mail: ecekarabiyikoglu@gmail.com
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Cone-beam CT (CBCT) systems designed specifically for imaging the maxillofacial area have become available for use to dental professionals since the end of the 1990's and have recently gained widespread popularity. With the development of new devices featuring more advanced imaging potential, CBCT has developed into the acknowledged standard for three-dimensional imaging of hard tissues in dentomaxillofacial radiology.[3] CBCT is an imaging technique developed primarily for implant dentistry. However, as its availability and accessibility have increased, it has been commonly exploited in all fields of dentistry.[4]

CBCT can guide diagnostic, operative, and monitoring processes along with treatment planning and it is a remarkably useful imaging method for examination of bone and dental structures.[4–6] Therefore, it is frequently requested for examination before maxillofacial and dental implant surgeries or diagnosis of benign/malignant tumors and bone pathologies.[7] It offers important diagnostic advantages to dental professionals, especially for complex anatomical structures and cases requiring surgical planning.[5,8,9] CBCT should be considered when the additional information obtained is expected to contribute to diagnosis and treatment planning or to improve clinical management, particularly in cases where 2D radiography is inconclusive.[10]

The necessity of using CBCT in accordance with appropriate clinical indications has been emphasized in the literature. The use of ionizing radiation in medical imaging has always been important in terms of radiation protection for personnel, patients and environment, and it has been recommended that the "As Low As Diagnostically Acceptable (ALADA)" principle should be followed. European Academy of Dentomaxillofacial Radiology has also recommended, as a common rule, that the field of view in imaging should be restricted only to the related area and the view should always contain the whole area.[3] The method that provides the most convenient radiographic information with the lowest radiation dose should be used in imaging process.[11] In 2009, EADMFR published the guideline titled "Basic Principles for Use of Dental Cone-Beam Computed Tomography." Article 18 of this guideline includes the following statement:[12] "Dentists responsible for CBCT facilities who have not previously received "adequate theoretical and practical training" should undergo a period of additional theoretical and practical training that has been validated by an academic institution (University or equivalent). Where national specialist qualifications in DMFR exist, the design and delivery of CBCT training programs should involve a DMF Radiologist." This statement was supported by the SedentexCT project and published by the European Commission with formal approval.[13]

Receiving training on the use of new imaging equipment and techniques is an essential part of efficient radiation protection. As with all imaging techniques, efforts should be made to obtain diagnostically sufficient images using the lowest possible radiation dose in CBCT as well. Therefore, the ALADA principle should be adopted and the difference between the risks of radiation amounts required to obtain "reasonable" and "good" quality images should be evaluated.[14]

The aim of this study is to investigate the indications for CBCT imaging requests in patients presented to the faculty of dentistry, and to estimate the compatibility of these requests with the indications recommended by SedentexCT.

Materials and Methods

Study Place and Design

This retrospective and descriptive study was conducted in the Department of oral and maxillofacial radiology (OMFR). CBCT requests obtained between January and December 2024 were – retrospectively – evaluated. The patients' demographic variables such as sex, age groups, and other related characteristics were recorded.

Ethical Approval

This study was approved by the Gülhane Scientific Research Ethics Committee of the University of Health Sciences (Date: May 6, 2025; Decision no: 2025-242) and was conducted in accordance with the principles of the Declaration of Helsinki.

Patients and Data Collection

A total of 1299 valid CBCT records were included in the analysis. Data were extracted from institutional radiological records and comprised patient demographics (sex and age), clinical departments requesting CBCT imaging, and indications for imaging. All data were anonymized before analysis.

Diagnostic Criteria

CBCT imaging indications were classified according to predefined clinical request categories recorded in the radiology request system. These indications were grouped into five main categories based on clinical purpose.

Definitions

Age was transformed into an ordinal variable by categorizing patients into four clinically meaningful age groups. Sex, CBCT indication, and the requesting clinical department were treated as nominal variables. Imaging indications and requesting departments were each classified into five categories for analytical purposes.

CBCT imaging indications were classified into five groups according to SedentexCT Evidence-Based Guidelines in 2011:[15]

1. Tooth abnormalities (based on number, shape, size, and position)
2. Impacted teeth
3. Endodontic pathologies (root-canal pathologies, thickening of the lamina dura, hypercementosis, etc.)
4. Bone pathologies
5. Other indications (dental implant treatment planning, craniofacial abnormalities, cleft lip and palate, trauma, root fractures, alveolar fractures, etc.).

Inclusion Criteria

CBCT requests obtained within the study period (January–December 2024) with complete demographic information, clearly defined imaging indications, and identifiable requesting clinical departments were included in the study.

Exclusion Criteria

Records with missing or incomplete demographic data, unclear or unspecified imaging indications, or duplicate entries were excluded from the analysis.

Clinical, Surgical, and Laboratory Investigations

As this study was retrospective and radiology-based, no additional clinical, surgical, or laboratory investigations were performed. Only existing CBCT imaging requests and associated metadata were evaluated.

Statistical Analysis

The distributional properties of the variables were examined using the Kolmogorov–Smirnov test; however, due to the categorical structure of the data, the parametric assumptions were not met. Consequently, non-parametric and categorical data analysis methods were employed throughout the study.

Chi-square (χ^2) tests were employed to examine the associations between departments and reasons for CBCT requests, with assumptions verified through expected cell counts. Expected counts were found to be less than five in 16% (four cells) of the tables. Since this proportion remained below the 20% threshold, meeting the robustness criteria for the standard Chi-square test, primary interpretations were based on Pearson Chi-square results. Furthermore, to confirm the reliability of the findings, Fisher's Exact Test results were reported using Monte Carlo simulation (10,000 samples, 99% CI). Due to the table dimensions being larger than 2×2, Cramer's V coefficient was utilized to evaluate the effect size. Following a significant overall $\chi 2$ test result ($p<0.05$), a log-linear model was applied to localize the source of the association. Subsequently, 10 pairwise comparisons (1 df) were performed among the k=5 primary request reason categories. To control Type I errors arising from multiple comparisons, p-values were adjusted using the Bonferroni procedure; effects are summarized by odds ratios with 99.5% confidence intervals, equivalent to a significance level of $\alpha=0.05/10$.

To evaluate the strength of associations, Cramer's V and Phi coefficients were calculated for nominal variables, enabling the study to report not only the presence but also the magnitude of relationships.

In addition, to provide a more comprehensive understanding of the direction and strength of associations between variables, a supplementary correlation analysis was performed.

A post hoc power analysis was conducted using G*Power version 3.1.9.7 (Heinrich Heine University, Düsseldorf, Germany) based on the Pearson Chi-square statistic of the primary analysis ($\chi 2=1156.046$, df=91, n=1299). With a significance level of $\alpha=0.05$, the achieved power ($1-\beta$) was >0.99.

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) for Windows, Version 25.0 (SPSS Inc., IL, USA). $p<0.05$ was considered statistically significant.

Results

An analysis of the demographic and clinical characteristics of the 1352 patients evaluated in this study revealed a broad age distribution (Table 1). The 46–60 age group, representing 34.1% of the sample, constituted the largest proportion of patients. This was followed by individuals aged 0–30 years (31.1%), those aged 31–45 years (20.1%), and patients aged 61 years and older (14.7%). These findings indicate that CBCT requests predominantly concentrate within the middle-aged and older adult populations.

With respect to sex, female patients accounted for 56.1% of the sample, whereas males represented 43.9%. This find-

Table 1. The descriptive statistics of the patients

Variables	Groups	Frequency	Percentage	Cumulative percentage
Age	0–30	420	31.1	31.1
	31–45	272	20.1	51.2
	46–60	461	34.1	85.3
	61+	199	14.7	100
	Total	1352	100	
Sex	Female	759	56.1	56.1
	Male	593	43.9	100
	Total	1352	100	100
Imaging Indication	Implant	734	54.3	54.3
	Impacted Tooth and Impacted Tooth with Pathology	217	16.1	70.3
	Lesion	222	16.4	86.8
	Maxillary Sinus	48	3.6	90.3
	Other*	78	5.8	96.1
	Total	1299	96.1	96.1
	Unclassified**	53	3.9	3.9
	Overall total	1352	100	100
Requesting department	Oral and maxillofacial surgery	586	43.3	43.3
	Periodontology	413	30.5	73.9
	Oral and maxillofacial radiology	165	12.2	86.1
	Orthodontics	124	9.2	95.2
	Other***	64	4.8	100
	Total	1352	100	

*: Other imaging indications include condylar and temporomandibular joint disorders, root fractures, root canal resorption, post-operative evaluation and complications, tooth and jaw morphology, trauma, foreign bodies, cleft lip and palate, and orthognathic surgery. **: Unclassified refers to CBCT requests without a clearly defined clinical indication in the imaging records and, therefore, could not be assigned to a specific category. ***: Other requesting departments include endodontics, pedodontics, prosthetic dental treatment, and restorative dental treatment.

ing indicates that CBCT examinations were requested relatively more frequently for female patients.

A total of 1299 CBCT indications were evaluated in the study. The most frequent indication was implant planning, comprising 54.3% of all requests. Lesion evaluation ranked second with 16.4%, followed by the assessment of impacted and pathologically impacted teeth at 16.1%. Maxillary sinus assessment accounted for 3.6%, while requests categorized as "other" constituted 5.8% of the total. This distribution highlights that CBCT is most commonly used in clinical practice for surgical planning, particularly before implant procedures.

When the clinical departments initiating CBCT requests were examined, the majority originated from the department of oral and maxillofacial surgery (OMFS), accounting for 43.3% of all requests. This was followed by the department of periodontology (30.5%), the department of OMFR (12.2%), and the department of orthodontics (9.2%). Requests from other clinical units represented 4.8% of the total. These findings demonstrate that CBCT is most intensively used in surgical and periodontal diagnostic–treatment workflows.

Overall, the results of this study illustrate that CBCT is a key imaging modality particularly favored for implant planning, surgical assessment, and periodontal treatment procedures.

An evaluation of CBCT request indications by sex showed that implant planning was the most frequent indication in both female and male patients (Table 2). A total of 58.5% of female patients (n=425) and 53.9% of male patients (n=309) underwent CBCT imaging for implant-related procedures, indicating that implant procedures represent the primary field of application for both sexes.

CBCT requests for impacted or pathologically impacted teeth were observed in 17.9% of women (n=130) and 15.2% of men (n=87). This distribution suggests that CBCT examinations for the evaluation of impacted teeth were requested more frequently for female patients.

Table 2. Distribution of imaging indications by sex (n/%)

Indication	Sex				Total	
	Female		Male			
	n	%	n	%	n	%
Implant	425	58.50	309	53.90	734	56.50
Impacted tooth and impacted tooth with pathology	130	17.90	87	15.18	217	16.70
Lesion	112	15.42	110	19.20	222	17.09
Maxillary sinus	20	2.75	28	4.89	48	3.70
Other*	39	5.38	39	6.80	78	6.00
Total	726	100	573	100	1299	100

*: Other imaging indications include condylar and temporomandibular joint disorders, root fractures, root canal resorption, post-operative evaluation and complications, tooth and jaw morphology, trauma, foreign bodies, cleft lip and palate, and orthognathic surgery.

Table 3. Distribution of imaging indications by age groups (n/%)

Indications	Age groups – n (%)				Total – n (%)
	0–30	31–45	46–60	61+	
Implant	57 (15.12)	172 (63.70)	354 (77.80)	151 (76.60)	734 (56.50)
Impacted tooth and impacted tooth with pathology	172 (45.62)	25 (9.26)	16 (3.52)	4 (2.03)	217 (16.71)
Lesion	91 (24.13)	46 (17.03)	55 (12.08)	30 (15.23)	222 (17.09)
Maxillary sinus	9 (2.39)	17 (6.29)	16 (3.52)	6 (3.04)	48 (3.69)
Other*	48 (12.73)	10 (3.70)	14 (3.07)	6 (3.04)	78 (6.00)
Total	377 (100.00)	270 (100.00)	455 (100.00)	197 (100.00)	1299 (100.00)

*: Other imaging indications include condylar and temporomandibular joint disorders, root fractures, root canal resorption, post-operative evaluation and complications, tooth and jaw morphology, trauma, foreign bodies, cleft lip and palate, and orthognathic surgery.

CBCT requests for lesion assessment were more evenly distributed between sexes but were higher among men (19.2%, n=110), compared to women (15.4%, n=112). These findings indicate that imaging for pathological conditions may be relatively more frequent in male patients.

Requests for maxillary sinus evaluation were also more common among men (4.9%, n=28) than women (2.8%, n=20), demonstrating a sex-related difference in sinus-related imaging indications.

Other request indications were similarly distributed between sexes (5.4% among women; and 6.8% among men).

Overall, the distribution of the 1299 CBCT requests by sex demonstrates that implant planning is the most prevalent imaging indication for both male and female patients. In contrast, indications such as lesion assessment and sinus evaluation appear more frequently among men. These findings suggest that clinical utilization patterns of CBCT may vary meaningfully by sex.

An examination of the distribution of CBCT request indications across age groups revealed that implant planning was the most frequent indication in all age categories (Table 3). Notably, implant-related CBCT requests reached particularly high proportions in the 46–60 age group (77.8%, n=354) and among individuals aged 61 years and older (76.6%, n=151). This pattern clearly reflects the markedly increased need for dental implants in older age groups. The 31–45 age groups also demonstrated a substantial proportion of implant requests (63.7%). In contrast, implant-related CBCT requests were considerably lower in the 0–30 age group (15.1%), which is consistent with the naturally lower demand for implant therapy in younger individuals.

CBCT requests for the assessment of impacted and pathologically impacted teeth showed pronounced variation across age groups. Such requests were highest in the 0–30 age group, accounting for 45.6% (n=172) of all indications, indicating that this developmental period is the most frequently associated with impacted-tooth-related pathologies. With increasing age, these requests declined sharply, reaching minimal levels in the 46–60 age groups (3.5%) and among those 61 years and older (2.0%).

Requests for lesion evaluation displayed a more balanced distribution across the age groups. The proportion of lesion-related CBCT requests was 24.1% (n=91) in the 0–30

Table 4. Analysis of differences in imaging indications by department

Measure	Value	df	Asymptotic significance (2-sided)	Monte carlo sig. (2-sided)
Pearson Chi-square	822.397	16	p<0.001	0.001
Likelihood ratio	779.814	16	p<0.001	0.001
Fisher's exact test	764.500	–	–	0.001
Linear-by-Linear association	158.414	1	p<0.001	p<0.001
Phi	0.796	–	p<0.001	p<0.001
Cramer's V	0.398	–	p<0.001	p<0.001

N of valid cases: 1299. Note: Four cells (16%) had expected counts <5 (minimum expected count=2.33); therefore, Monte Carlo simulation (10,000 samples, 99% confidence interval) was applied. p<0.001 are reported as p<0.001. df: Degrees of freedom.

Table 5. Analysis of differences in imaging indications by age group

Measure	Value	df	Asymptotic significance (2-sided)	Monte carlo sig. (2-sided)
Pearson Chi-square	503.019	12	p<0.001	p<0.001
Likelihood ratio	518.397	12	p<0.001	p<0.001
Fisher's exact test	513.423	–	–	p<0.001
Linear-by-Linear association	141.563	1	p<0.001	p<0.001
Phi	0.707	–	p<0.001	p<0.001
Cramer's V	0.320	–	–	–

N of Valid Cases: 1299. Note: Monte Carlo simulation (10,000 samples, 99% confidence interval) was applied due to low expected cell counts. p<0.001 are reported as p<0.001. df: Degrees of freedom.

age group, 17.0% in the 31–45 age group, 12.1% in the 46–60 age group, and 15.2% in those 61 years and older. This distribution suggests that lesions requiring imaging assessment are encountered with relatively similar frequency across different age groups.

CBCT requests for maxillary sinus evaluation were low in all age groups; however, the 31–45 age group exhibited a slightly higher proportion (6.3%) compared with other groups.

Requests classified under "other" indications remained low and relatively similar across all age categories.

In summary, distinct differences were observed in CBCT request indications across age groups. While implant planning predominated in middle-aged and older adults, impacted tooth evaluation emerged as the most common indication among younger individuals. These findings highlight how CBCT utilization patterns reflect age-dependent clinical needs.

The relationship between CBCT request indications and the clinical departments initiating these requests was analyzed (Table 4). The results indicate that CBCT request indications differ significantly across clinical departments and reflect variations in CBCT utilization according to specialty-specific diagnostic and treatment workflows.

The analyses revealed that the variation primarily stemmed from department-specific clinical practices. The OMFS department predominantly requested CBCT imaging for implant planning and impacted/pathologically impacted teeth. The periodontology department was almost exclusively focused on implant-related requests. OMFR department showed higher frequencies of lesions and maxillary sinus evaluations, while orthodontics was especially associated with impacted tooth assessments. Other departments demonstrated distinctive patterns in lesion-related and miscellaneous CBCT indications.

Collectively, these findings demonstrate that differences in CBCT request indications are driven by specialty-specific usage patterns and highlight distinct diagnostic priorities among clinical disciplines.

The association between CBCT request indications and age groups was evaluated (Table 5). The analyses revealed that requests for evaluation of impacted and pathologically impacted teeth were significantly more frequent in the 0–30 age group compared with all other age categories. In contrast, implant-related CBCT requests were predominant in the 31–45 and 46–60 age groups, and similarly represented the most frequent indication in individuals aged 61 years and older. Requests for maxillary

Table 6. Correlation table

Correlations[b]				
Spearman's rho	**Sex**	**Indication**	**Department**	**Age**
Sex				
Correlation coefficient	1	0.042	-0.031	0.023
Sig. (two-tailed)		0.129	0.261	0.416
Indication				
Correlation coefficient			0.247**	-0.502**
Sig. (two-tailed)			0	0
Department				
Correlation coefficient			1	-0.187**
Sig. (two-tailed)				0
Age				
Correlation coefficient				1

Spearman's rho correlation coefficients are presented. Categorical variables were coded numerically for correlation analysis. Correlations marked with **are significant at the 0.01 level (two-tailed). p<0.001 are reported as p<0.001. List-wise n=1299.

sinus evaluation and other indications exhibited relatively low frequencies across all age groups.

These findings demonstrate that the distribution of CBCT indications varies meaningfully by age and reflects age-related clinical priorities in diagnostic imaging.

A correlation analysis was conducted to evaluate the relationships among sex, age, requesting department, and CBCT request indications. The results of the Spearman's rho test are presented in Table 6.

Sex showed only very weak correlations with the other variables: A weak positive correlation with the reason for the request ($r=0.042$, $p>0.05$), a weak negative correlation with the requesting department ($r=-0.031$, $p>0.05$), and a weak positive correlation with age ($r=0.023$, $p>0.05$). These findings indicate that sex was not a determining factor in CBCT request patterns.

By contrast, significant associations were observed for age and department. The indication for CBCT was moderately and negatively correlated with patient age ($r=-0.502$, $p<0.01$), suggesting that younger patients were more frequently referred for non-implant-related reasons such as, impacted teeth, whereas implant planning was predominant among older age groups. In addition, a weak but significant positive correlation was found between the request indication and the department ($r=0.247$, $p<0.01$), reflecting that certain clinical departments were more strongly associated with specific request reasons. A weak but significant negative correlation between department and age ($r=-0.187$, $p<0.01$) further supported the observation that referrals from some departments (e.g., orthodontics and pediatric dentistry) were concentrated in younger age groups, while others (e.g., prosthodontics and periodontology) were associated with older patients.

Overall, these results indicate that while sex had little influence on referral patterns, both patient age and the requesting department played a substantial role in shaping the distribution of CBCT indications.

Discussion

At present, CBCT is commonly utilized for assessing the alveolar bone and adjacent anatomical structures before implant surgery. Specifically, in the posterior maxilla, factors including alveolar bone trabeculation, the positioning of the maxillary sinus, and sinus pneumatization can contribute to implant failure.[16]

This study provides a comprehensive evaluation of CBCT referral patterns in a university dental faculty, highlighting both similarities and differences compared with the existing literature.

According to Geduk and Haylaz,[17] requests for CBCT for pre-operative implant planning constituted 29.5% of all CBCT indications. Implant evaluation constitutes a prevalent rationale for requests for CBCT. The department of periodontology often requests CBCT to assess adjacent anatomical structures before implant surgery. Tarım Ertaş and Kalabalık[8] reported a rate of 25.19% for implant-related CBCT requests, whereas Menziletoğlu et al.[18] identified this rate as 43.12%. The findings underscore the importance of CBCT as an imaging modality in implant planning. In this study, requests for CBCT related to implants accounted for 54.3% of total requests. Warhekar et al.,[19] Türker and Göller Bulut,[20] and Akarslan and Peker[21] documented comparable rates of 52.7%, 52.7%, and 42.04%, respectively. The department of OMFS was the most frequently requested, accounting for 43.3%, followed by periodontology at 30.5% and OMFR at 12.2%. The higher rate in our setting may be explained by the fact that implant procedures are performed extensively in OMFS and periodontology clinics at university hospitals, where costs are lower and multidisciplinary support is available.

Geduk and Haylaz[17] found that 20.6% of CBCT requests were for lesion assessment, ranking it as the second most prevalent indication, whereas Yalçın and Artaş[22] found that intraosseous lesions represented 23.07% of requests, predominantly initiated by the department of OMFS. Consistent with the existing literature, our study identified lesion evaluation as the second most common indication for CBCT utilization, occurring at a rate of 17.1%. These findings underscore the clinical reliance on CBCT for three-dimensional visualization of cysts, tumors, and bone pathologies.

The application of CBCT to evaluate the position of impacted teeth and their relationship with adjacent structures is well established.[23] Yalçın and Artaş[22] reported a rate of 6.73%, whereas Tarım Ertaş and Kalabalık[8] found it to be 32.13%. These differences may arise from variations in the average age of the patient population or regional factors. In contrast, in a referral-based retrospective study, Vollan et al.[24] identified impacted teeth and endodontic issues as the predominant indications for CBCT examinations. In this study, requests for CBCT imaging of impacted teeth accounted for 13.4%, placing them in third position. Importantly, our age-stratified analysis showed that impacted tooth referrals were highly concentrated in younger patients (particularly 0–14 years), while implant requests dominated in older groups. This highlights how demographic distribution strongly shapes referral trends.

In a study conducted on children and young individuals, Ismayılov and Özgür[25] reported that malocclusion and dentofacial anomaly were the most common indications for CBCT imaging (28.7%), while our findings demonstrate that in the 0–30-year age group, CBCT was most frequently requested for impacted teeth and impacted teeth with pathology (45.62%), which may reflect differences in age grouping, referral patterns, and institutional clinical priorities.

Yalçın and Artaş[22] indicated that requests for CBCT in sinus evaluation represented 2.38% of total requests. In the current investigation, the observed rate was 3.7%, contrasting with the 0.8% reported by Warhekar et al.[19] in 2015. The observed discrepancy may be attributed to demographic factors, including ethnicity, or to advancements in dental imaging and implant procedures in the last decade.

Yalçın and Artaş[22] reported that CBCT requests for temporomandibular joint (TMJ) evaluation constituted 1.29% of total requests, while Warhekar et al.[19] indicated a figure of 12.4%. In contrast, in our study, this rate was identified only within the "other" category, accounting for 5.8%, likely attributable to the preference for magnetic resonance imaging, which offers superior soft-tissue contrast for TMJ evaluation.[26]

In endodontics, CBCT is utilized to evaluate of root resorption, identify root canals, assess trauma, planning of endodontic surgery, and localization of fractured instruments[27] Matherne et al.[28] compared between CBCT and 2D digital imaging, revealing that a considerable number of root canals were overlooked with 2D techniques. In this study, the requests originating from the field of endodontics were inconsistent with the existing literature. This discrepancy may be attributed to a preference for two-dimensional alternative imaging techniques – such as angled radiographs or tube-shift methods – to minimize radiation exposure. These 2D approaches may allow clinicians to obtain the necessary diagnostic information without the need for CBCT.

Conclusion

According to the results of this study, most CBCT requests at our faculty comply with SedentexCT guidelines. Nevertheless, implementing structured protocols and enhancing staff training may further reduce unnecessary radiation exposure and optimize the appropriate use of CBCT in dental practice.

Ethics Committee Approval: The Gülhane Scientific Research Ethics Committee of the University of Health Sciences granted approval for this study (date: 06.05.2025, number: 2025-242).

Informed Consent: Informed consent was not required due to the retrospective nature of the study.

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