

# Evaluation of the Prevalence of Endo-Periodontal Lesions According to the New Classification of Periodontal and Peri-Implant Diseases

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## ABSTRACT

**Objective:** The study aimed to determine the prevalence of endo-periodontal lesions (EPL) in individuals with periodontitis, to evaluate these lesions according to the new Classification of Periodontal and Peri-Implant Diseases and Conditions (2017-Classification), and to investigate the relationship of EPLs with various parameters.

**Methods:** The files of patients diagnosed with periodontitis were retrospectively evaluated in terms of age, gender, periodontal disease stage, EPL grade, number of EPL, radiographic shape, oral location, caries, presence of restoration, and furcation involvement of the tooth with EPL.

**Results:** EPL was detected in 77 patients, consisted of 35 females and 42 males (mean age: 43.97±11.60), from a total of 800 patient files in the study. It was determined that the patients mostly received Stage III (n=43, 55.8%) in terms of periodontal diagnosis, and the teeth diagnosed with EPL had mostly Grade 3 (n=50, 64.9%) and cone-shaped (n=49, 63.6%) according to radiographic appearance. It was determined that EPL was mostly detected in mandibular molars (n=32, 41.6%), and the majority of teeth with EPL did not have root canal treatment (n=63, 81.8%), a prosthetic restoration (n=59, 76.6%), or caries (n=58, 75.3%). No significant difference was found between age groups and genders in terms of EPL number, grade, radiographic shape, and localization. In addition, there was no statistically significant difference between the number of teeth with EPL and the stage of periodontal disease.

**Conclusion:** Prevalence of EPL was 9.62% in this study. Within the limitations of this study, it can be stated that according to the 2017-Classification, the number, grade, radiographic shape, and localization of EPL in periodontitis patients did not differ according to gender and age ranges. EPL was observed more in Stage III periodontitis patients and in mandibular molar teeth, and the rate of EPL-Grade 3 and radiographic images with cone-shaped was higher in these patients.

**Keywords:** panoramic radiography, peri-implant diseases, periodontal diseases, periodontitis, prevalence

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## INTRODUCTION

There is a relationship between the periodontium and the dental pulp for anatomical, pathological, or iatrogenic reasons [1]. Due to this relationship, these two structures are in communication and interaction [2]. In fact, this relationship may lead to the emergence of lesions that affect periodontal and pulpal tissues at the same time [3]. These lesions, called endo-periodontal lesions (EPL), can occur acutely or chronically through the connection between pulpal and periodontal tissues [4]. However, microorganisms play a fundamental role in the inflammatory processes causing the development of these lesions. Seven bacterial species have been identified in root canals and periodontal pockets [5], which are reported to belong specifically to the yellow, purple, and green microbial complexes [5]. DNA extraction and PCR amplification were performed in microbial analysis of samples obtained from teeth diagnosed with EPL [6]. The polymicrobial nature of EPL was highlighted and the predominance of important Periopathogens was detected [6].

Predisposing factors for EPL include various chemicals used in dentistry, iatrogenic conditions during endodontic treatments (e.g., root canal perforations, coronal leakage, vertical root fractures due to excessive force used during lateral condensation of gutta-percha) or periodontal treatments (e.g., decreased blood flow due to excessive scaling and root planning) [7]. Genetic factors, lifestyle (e.g. smoking, stress, nutrition), systemic diseases (diabetes, obesity) can also be considered as predisposing and etiological factors [8]. Deep periodontal pockets may be detected in relation to these lesions, and/or a negative/altered response to pulp viability tests may be

received [4]. In addition, it is possible to observe a variety of clinical scenarios and radiographic findings (such as bone loss at the apical or furcation site), such as spontaneous or palpation/percussion pain, purulent discharge/suppuration, tooth mobility, sinus tract/fistula, and discoloration of enamel and/or gingiva [9].

The Classification of Periodontal and Peri-Implant Diseases and Conditions (2017-Classification) is a new classification system presented considering evidence-based studies. With the classification, information about the pathogenesis and etiology of the disease and their relationship with other diseases has been updated [10]. This up-to-date information includes the introduction of EPL in new categories [4]. Accordingly, EPL was categorized in two ways as the presence and absence of root damage. EPLs without root damage are divided into two groups, to be seen in patients with and without periodontitis. These lesions are then defined as Grade I, II, and III according to the number of periodontal pockets around the tooth and the depth and width of the pocket [4]. Here, evaluating the condition of the lesion at the time of detection, such as whether there is a fracture in the tooth, root perforations and periodontitis, and the extent of periodontal damage in the affected tooth, and in particular classifying the lesion according to the symptoms that will affect the treatment is aimed [4]. In other words, it provides a clinical focus based on the signs and symptoms that have a direct effect on the prognosis and treatment of the tooth [11]. With this new concept, it can be thought that the primary origin (endodontic or periodontal) of EPL does not have a priority in the treatment of EPL.

The fact that dentists and dental interns have insufficient knowledge and awareness about EPL [12]. Dentists need more study materials on this subject in the undergraduate curriculum [13]. It shows the need for an in-depth examination of this issue. The study by Ruetters et al. [14] is one of the studies reporting the prevalence of EPL according to the 2017-Classification. In this study, 1008 panoramic X-rays were evaluated, and 866 patients were included [14]. According to the results of this study, the prevalence of EPL was reported as 4.9%. It was also reported that most of the lesions were detected in patients with Stage III-IV periodontitis. According to the data of another recent study, the presence of EPL is affected by age, number of teeth, and different periodontal conditions, and EPL is most commonly observed in molars [15].

### Main Points

- A limited number of studies evaluated endo-periodontal lesions (EPL) according to the Classification of Periodontal and Peri-Implant Diseases and Conditions.
- Assessing prevalences of EPL could be an important addition to periodontal diagnosis and treatment.
- In this study, the EPL rate was determined as 9.62% in the patients examined in the specified time period.
- EPL was observed more in Stage III periodontitis patients and in mandibular molar teeth.

It is noteworthy that in the literature review, a limited number of studies evaluated EPL according to the 2017-Classification [14, 15]. Thus, the present study aims to define EPL according to the 2017-Classification in individuals with localized or generalized periodontitis over a certain period of time, to evaluate the prevalence of EPL and their relationship with various parameters. The null hypothesis of the presented study is that the prevalence and types of EPL in the evaluated population are not different from the distribution observed in the literature.

## MATERIALS AND METHODS

Approval was obtained from the Non-Interventional Ethics Committee of Yüzüncü Yıl University for this retrospective study (Decision number: 2024/08-04, Date: 2024-07-12). The study has a retrospective design. The data were obtained by examining patients' archive records. These records consisted of anamnesis forms, clinical periodontal records, dental information, and radiographs. First of all, the files were planned to be examined between September 2022 and July 2024. However, due to the lack of clinical and radiographic data, 800 patients who were diagnosed with periodontitis between April 2024 and July 2024 and who met the study criteria were included in the evaluation. Due to the retrospective nature of the study, routine clinical consent forms were obtained so that patients' data could be used anonymously. The flowchart of the study is presented in Figure 1.

The study inclusion criteria comprised of: a) patients diagnosed with localized or generalized periodontitis with periodontal clinical parameters; b) with a panoramic radiography of such sufficient quality as to allow assessment; c) patients who had teeth without a history of root damage or trauma.

The exclusion criteria comprised of: a) patients who were under the age of 18; b) those who are receiving orthodontic treatment; c) patients who experienced a complication during trauma, endodontic treatment, or reported a result that would cause the possibility of root fracture. Because the primary aim of this study was to examine the prevalence and clinical/radiographic features of EPL, the grade of periodontal disease, systemic status of the patients, and drug use were not taken into account. Presence of furcation involvement applied to all molars and maxillary first premolars. Radiographic evaluation was performed by a single clinician (ETS), and a maximum

of 50 X-rays were evaluated per day. Kappa coefficients were calculated to determine the agreement between the EPL radiographic shape and periodontitis stage measurements. Kappa coefficients were found to be 0.74 and 0.84, respectively. When the clinician (ETS) was unsure, she consulted another clinician who had nine years of experience (DA).

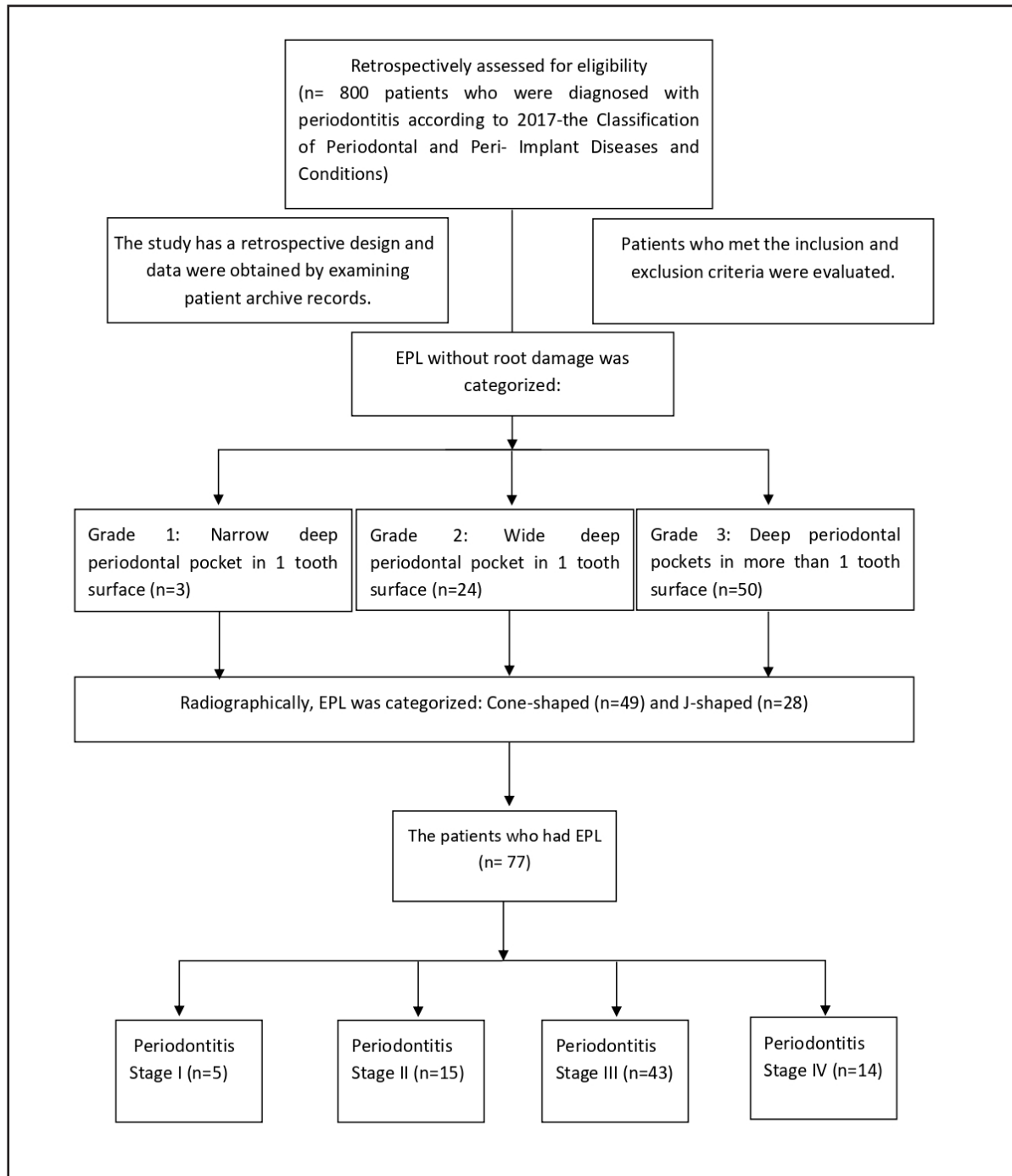
Teeth with EPL were excluded from the staging presented by periodontal diagnosis [15]. According to the 2017-Classification, teeth with EPL are categorized as Grade I in the presence of narrow deep periodontal pockets on one surface of the tooth, Grade II in the presence of large deep periodontal pockets on one surface of the tooth, and Grade III in the presence of deep periodontal pockets on more than one surface of the tooth [4, 9]. Radiographically, teeth with EPL are divided into two categories as cone-shaped and J-shaped [15]. When assessing the stage of periodontal disease, interdental clinical attachment loss and greatest radiographic bone loss in the area were assessed. Then, the complexity factors were assessed, and the stage was diagnosed [9].

## Statistical Analysis

Sample size calculation: In the previous studies, the prevalence of EPL was observed between 14.89% [16] and 15.34% [17]. Accordingly, when determining the sample size in the study, the proportion (p) of EPL was considered to be 15% (in this case, q = 90%). Also the effect size (d, effect size) was considered to be 0.025 for a 5% Type-I error ( $\alpha = 0.05$ ) and a power value of approximately 80% at a 95% confidence level. Thus, minimum sample size was calculated as the following equation.

$$n = [(p \times q) \times Z^2] / d^2, n = (0.15 \times 0.85 \times 1.962) / 0.025^2 = 784 \text{ patients.}$$

Descriptive statistics for the continuous variables were presented as mean, standard deviation, minimum and maximum values while count and percentages for categorical variables. Independent sample t test was performed for the comparison of group means. Chi-square test was performed to determine the relationship between categorical variables. Statistical significance level was considered as 5% and SPSS (IBM Corp. Armonk, NY, Ver: 21) statistical program was used for all statistical computations.



**Figure 1.** The flowchart of the study methodology

**RESULTS**

In the study, 800 patients with periodontitis were included, and EPL was detected in a total of 77 patients (9.62%). Patients with EPL consisted of 35 females and 42 males (mean age: 43.97±11.60). There was no statistical difference between the genders in terms of age, the Decayed, Missing, and Filled teeth index, and total number of teeth (Table 1). In the study, it was

observed that the majority of the patients did not have dental implants (n=72, 93.5%), and the patients were mostly diagnosed with Stage III (n=43, 55.8%) in terms of periodontal diagnosis (Table 2). It was determined that the teeth diagnosed with EPL were mostly in Grade 3 (n=50, 64.9%) according to the EPL classification and had cone-shaped (n=49, 63.6%) (Table 2). EPL was mostly detected in mandibular molars (n=32, 41.6%), and

it was determined that the majority of teeth with EPL did not have root canal treatment (n=63, 81.8%), a prosthetic restoration (n=59, 76.6%), or caries (n= 58, 75.3%) (Table 2). Age groups and gender differences were not statistically significant in terms of the number of teeth with EPL, EPL-grade, radiographic shape, and localization of the tooth with EPL (Tables 3 and 4). There was no significant difference between the stage of periodontal disease and the number of EPL teeth (Table 5). In addition, there was no significant difference in the radiographic shape of EPL in terms of jaw and tooth localization (Table 6).

Evaluations made according to age groups, gender, stage of periodontal disease, radiographic shape of EPL, EPL tooth and arch localization, root canal treatment status of the tooth, prosthetic restoration, presence of caries, and furcation involvement with EPL-grade are presented in Table 7. Accordingly, a significant relationship was found between EPL-grade and the radiographic shape of the lesion (P=0.009) and arch localization (P=0.012). It was determined that the cone-shaped lesion was mostly in Grade 3, and the J-shaped lesion was mostly in Grade 1. In addition, EPL-Grade 1 was mostly in the maxilla, and EPL-Grade 2 and 3 were mostly in the mandible.

**Table 1.** Distribution of age, DMFT index and total number of teeth according to gender

Variables	Gender	n	Mean±Std. Dev.	P value
Age (years)	Female	35	43.60±10.81	0.798
	Male	42	44.29±12.35	
	Total	77	43.97±11.60	
DMFT index	Female	35	9.37±5.12	0.722
	Male	42	9.79 ±5.03	
	Total	77	9.60±5.04	
Total number of teeth	Female	35	21.69±4.65	0.463
	Male	42	20.71±6.53	
	Total	77	21.16±5.73	

DMFT: The Decayed, Missing, and Filled teeth, Std. Dev: Standard deviation

P<0.05: Statistical significance Independent Samples t-test

**Table 2.** Baseline characteristics of the study population and characteristics of teeth with endo-periodontal lesions

Variables		n	%
Gender	Female	35	45.5
	Male	42	54.5
Age groups (years)	20-30	10	13.0
	31-40	23	29.9
	41-50	24	31.2
	≥ 51	20	26.0
Presence of dental implant	Yes	5	6.5
	No	72	93.5
Stage	Stage I	5	6.5
	Stage II	15	19.5
	Stage III	43	55.8
	Stage IV	14	18.2

Number of teeth with EPL	1	59	76.6	
	2	11	14.3	
	≥3	7	9.1	
EPL-Grade	Grade 1	3	3.9	
	Grade 2	24	31.2	
	Grade 3	50	64.9	
Radiographic shape of EPL	Cone-shaped	49	63.6	
	J-shaped	28	36.4	
Teeth type with EPL	Incisor-canine	15	19.5	
	Premolar	19	24.7	
	Molar	43	55.8	
Arch localization of teeth with EPL	Maxilla	22	28.6	
	Mandible	55	71.4	
Tooth groups (type of the tooth and arch localization)	Maxillary incisors-canines	6	7.8	
	Maxillary premolars	5	6.5	
	Maxillary molars	11	14.3	
	Mandibular incisors-canines	9	11.7	
	Mandibular premolars	14	18.2	
	Mandibular molars	32	41.6	
Regional localization (regardless of the jaw)	Right region	47	61.0	
	Left region	30	39.0	
Regional localization	Maxilla	Right region	12	15.6
		Left region	10	13.0
	Mandible	Right region	37	48.1
		Left region	18	23.4
Presence of root canal treatment	Yes	14	18.2	
	No	63	81.8	
Presence of prosthetic restoration	Yes	18	23.4	
	No	59	76.6	
Presence of caries	Yes	19	24.7	
	No	58	75.3	
Presence of furcation involvement (for all molars and maxillary first premolars)	Yes	32	41.6	

EPL: Endo-periodontal lesions, Chi-square test

**Table 3.** Relationship between age groups and baseline characteristics of teeth with endo-periodontal lesions

Variables			Age groups (years)				P value
			41-50	≥51	20-30	31-40	
Number of teeth with EPL	1	n	8	20	17	14	0.337
		%	13.6%	33.9%	28.8%	23.7%	
	2	n	2	1	3	5	
		%	18.2%	9.1%	27.3%	45.5%	
	≥3	n	0	2	4	1	
		%	0.0%	28.6%	57.1%	14.3%	
EPL-Grade	Grade 1	n	0	2	1	0	0.538
		%	0.0%	66.7%	33.3%	0.0%	
	Grade 2	n	2	6	7	9	
		%	8.3%	25.0%	29.2%	37.5%	
	Grade 3	n	8	15	16	11	
		%	16.0%	30.0%	32.0%	22.0%	
Radiographic shape of EPL	Cone-shaped	n	8	15	16	10	0.410
		%	16.3%	30.6%	32.7%	20.4%	
	J-shaped	n	2	8	8	10	
		%	7.1%	28.6%	28.6%	35.7%	
Teeth type with EPL	Incisors-canines	n	0	7	3	5	0.412
		%	0.0%	46.7%	20.0%	33.3%	
	Premolars	n	2	5	7	5	
		%	10.5%	26.3%	36.8%	26.3%	
	Molars	n	8	11	14	10	
		%	18.6%	25.6%	32.6%	23.3%	
Arch localization of teeth with EPL	Maxilla	n	1	7	8	6	0.569
		%	4.5%	31.8%	36.4%	27.3%	
	Mandible	n	9	16	16	14	
		%	16.4%	29.1%	29.1%	25.5%	
Tooth groups	Maxillary incisors-canines	n	0	3	0	3	0.212
		%	0.0%	50.0%	0.0%	50.0%	
	Maxillary premolars	n	1	2	1	1	
		%	20.0%	40.0%	20.0%	20.0%	
	Maxillary Molars	n	0	2	7	2	
		%	0.0%	18.2%	63.6%	18.2%	
	Mandibular incisor-canine	n	0	4	3	2	
		%	0.0%	44.4%	33.3%	22.2%	
	Mandibular premolars	n	1	3	6	4	
		%	7.1%	21.4%	42.9%	28.6%	
	Mandibular molars	n	8	9	7	8	
		%	25.0%	28.1%	21.9%	25.0%	

EPL: Endo-periodontal lesions, Chi-square test,  $P < 0.05$ : Statistical significance

**Table 4.** Relationship between gender and baseline characteristics of teeth with endo-periodontal lesions

Variables			Gender		P value
			Female	Male	
Number of teeth with EPL	1	n	27	32	0.989
		%	45.8%	54.2%	
	2	n	5	6	
		%	45.5%	54.5%	
	≥3	n	3	4	
		%	42.9%	57.1%	
EPL-Grade	Grade 1	n	2	1	0.745
		%	66.7%	33.3%	
	Grade 2	n	11	13	
		%	45.8%	54.2%	
	Grade 3	n	22	28	
		%	44.0%	56.0%	
Radiographic shape of EPL	Cone-shaped	n	25	24	0.194
		%	51.0%	49.0%	
	J-shaped	n	10	18	
		%	35.7%	64.3%	
Teeth type with EPL	Incisors-canines	n	8	7	0.731
		%	53.3%	46.7%	
	Premolars	n	9	10	
		%	47.4%	52.6%	
	Molars	n	18	25	
		%	41.9%	58.1%	
Arch localization of teeth with EPL	Maxilla	n	9	13	0.612
		%	40.9%	59.1%	
	Mandible	n	26	29	
		%	47.3%	52.7%	
Tooth groups	Maksillary incisors-canines	n	3	3	0.795
		%	50.0%	50.0%	
	Maksillary premolars	n	3	2	
		%	60.0%	40.0%	
	Maksillary molars	n	3	8	
		%	27.3%	72.7%	
	Mandibular incisors-canines	n	5	4	
		%	55.6%	44.4%	
	Mandibular premolars	n	6	8	
		%	42.9%	57.1%	
	Mandibular molars	n	15	17	
		%	46.9%	53.1%	

Chi-square test, P&lt;0.05: Statistical significance

**Table 5.** Relationship between the number of teeth with endo-periodontal lesions and stages of periodontal disease

Periodontal Status			Number of teeth with EPL			P value
			≥3	1	2	
Stage	Stage I	n	5	0	0	0.123
		%	100.0%	0.0%	0.0%	
	Stage II	n	12	3	0	
		%	80.0%	20.0%	0.0%	
	Stage III	n	34	6	3	
		%	79.1%	14.0%	6.9%	
	Stage IV	n	8	2	4	
		%	57.1%	14.3%	28.6%	

EPL: Endo-periodontal lesions, Chi-square test, P<0.05: Statistical significance

**Table 6.** Association between radiographic shape of endo-periodontal lesions and teeth localization

Variables		Radiographic shape of EPL				P value
		Cone-shaped		J-shaped		
		n	%	n	%	
Arch localization of teeth with EPL	Maxilla	12	24.5%	10	35.7%	0.294
	Mandibulla	37	75.5%	18	64.3%	
Teeth type with EPL	Incisors-canines	11	22.4%	4	14.3%	0.108
	Premolars	15	30.6%	4	14.3%	
	Molars	23	46.9%	20	71.4%	
	Maxillary incisors-canines	4	8.2%	2	7.1%	0.259
	Maxillary premolars	4	8.2%	1	3.6%	
	Maxillary molars	4	8.2%	7	25.0%	
	Mandibular incisors-canines	7	14.3%	2	7.1%	
	Mandibular premolars	11	22.4%	3	10.7%	
	Mandibular molars	19	38.8%	13	46.4%	

EPL: Endo-periodontal lesions, Chi-square test, P<0.05: Statistical significance

**Table 7.** Comparison of endo-periodontal lesions grades with age, gender, periodontal disease stage, and tooth characteristics

Variables		EPL-Grade						P value
		Grade 1		Grade 2		Grade 3		
		n	%	n	%	n	%	
Age groups (years)	20-30	0	0.0%	2	8.3%	8	16.0%	0.538
	31-40	2	66.7%	6	25.0%	15	30.0%	
	41-50	1	33.3%	7	29.2%	16	32.0%	
	≥51	0	0.0%	9	37.5%	11	22.0%	

Gender	Female	2	66.7%	11	45.8%	22	44.0%	0.745
	Male	1	33.3%	13	54.2%	28	56.0%	
Stage	Stage I	0	0.0%	2	8.3%	3	6.0%	0.105
	Stage II	0	0.0%	9	37.5%	6	12.0%	
	Stage III	2	66.7%	12	50.0%	29	58.0%	
	Stage IV	1	33.3%	1	4.2%	12	24.0%	
Radiographic shape of EPL	Cone-shaped	1	33.3%	10	41.7%	38	76.0%	<b>0.009*</b>
	J-shaped	2	66.7%	14	58.3%	12	24.0%	
Tooth type with EPL	Incisors-canines	2	66.7%	3	12.5%	10	20.0%	0.260
	Premolars	0	0.0%	7	29.2%	12	24.0%	
	Molars	1	33.3%	14	58.3%	28	56.0%	
Arch localization of teeth with EPL	Maxilla	3	100.0%	8	33.3%	11	22.0%	<b>0.012*</b>
	Mandible	0	0.0%	16	66.7%	39	78.0%	
Presence of root canal treatment	Yes	1	33.3%	5	20.8%	8	16.0%	0.692
	No	2	66.7%	19	79.2%	42	84.0%	
Presence of prosthetic restoration	Yes	0	0.0%	7	29.2%	11	22.0%	0.492
	No	3	100.0%	17	70.8%	39	78.0%	
Presence of caries	Yes	0	0.0%	9	37.5%	10	20.0%	0.158
	No	3	100.0%	15	62.5%	40	80.0%	
Presence of furcation involvement	Yes	0	0.0%	8	33.3%	24	48.0%	0.161
	No	3	100.0%	16	66.7%	26	52.0%	

EPL: Endo-periodontal lesions, Chi-square test, \*P<0.05: Statistical significance

## DISCUSSION

EPL was observed more in Stage III periodontitis patients and in mandibular molar teeth, and the rate of EPL-Grade 3 and cone-shaped radiographic images were higher in these patients in this study. Based on the results of the study, it can be emphasized that in depth clinical and radiographic evaluations should be made and attention should be paid to the possibility that EPL may be seen more common in certain periodontal stage types and certain teeth.

Periodontitis is a disease that progresses with soft tissue and alveolar bone destruction around the teeth and can turn into severe forms with the deepening of the periodontal pockets when left untreated [18]. Moreover, in severe forms of this disease, degenerative changes may develop in the dental pulp through the main, lateral, and accessory canals of the roots or dentinal canals [1, 19]. In addition, the pulp can cause apical infection to pass to the periodontal tissues through these pathways, and as a result, EPL may develop [1]. EPL was investigated in this study due to the inseparable nature of these two structures.

Although numerous classifications of endodontic-periodontal disease have been proposed, the classification introduced by Simon et al. [20] in 1972 has been used quite frequently. This classification includes evaluations according to the primary source of the lesion. However, with the 2017-Classification, another perspective came to the fore for EPL. In this perspective, the primary source of the disease was not at the forefront for diagnosis, and the current condition of the existing disease and the prognosis of the tooth with EPL were prioritized [1, 4]. In other words, assisting the treatment planning constituted the main concept in the 2017-Classification. Determining the prevalence of these lesions can be considered the first step in shaping this concept. In recent studies conducted according to the 2017-Classification, EPL was detected in 31.6% [15] and 4.9% [14] of the examined radiographs. In the current study, this rate was determined as 9.62%. In addition, previous studies found EPL to be 4% [21], 6.58% [22] (non-diabetic group) 13.15% [22], 14.89% [16], 15.34% [17], 17.3% [23], and 36% [24] according to the previous classification. These variations may be due to

the epidemiological and methodological factors (the difference in the number of radiographs, radiographic diversity, inclusion/exclusion criteria) and the classification-related factors.

The patient's general condition (poor oral hygiene, oral pathogens, parafunctional habits, lifestyle, systemic status, age) or dental conditions (anatomical issues, developmental malformations, trauma, malocclusion, internal or external root resorption, iatrogenic complications during treatment) may contribute to the development of EPL [8, 25, 26]. Sălceanu et al. [27] highlighted being age 60-years or older as one of the significant independent risk factors for endodontically treated EPL. When the distribution of EPL in terms of gender and age was examined, Prashaanthi et al. [23] detected EPL in 26 of 150 patients (17.3%) and reported that the rate of EPL was higher in patients between the ages of 31-40 and in males. Gunec et al. [15] determined the mean age of patients with EPL as 49 and found EPL to be more common among female. In the present study, the mean age of patients with EPL was approximately found to be 44, and the EPL rate was found to be higher in males, and between the ages of 41-50 (31.2%) and 31-40 (29.9%). However, no significant difference was found in the parameters examined according to age range and gender.

Gunec et al. [15] reported that teeth with EPL were mostly localized in patients with Grade A or B bone loss, and that the majority of patients with Stage I or II bone loss had teeth with EPL. In the present study, the grade of periodontal disease was not evaluated; the stage of the disease, which is under the influence of complexity factors such as pocket depth, bone loss, and furcation problems, was evaluated. As a result, the EPL rate was found to be higher in Stage III periodontitis patients. However, no significant relationship was found between the number of EPL teeth and stage. Unlike the previous study, EPL was found to be higher in patients with severe periodontitis in this study. This suggests that EPL may be encountered at any stage of periodontitis. The population differences in this study may be a possible explanation for the different results. Assessing the individuals' access to dental care, including periodontal or endodontic treatment, may be important in this regard. This finding may indicate that patients with severe periodontitis are referred to our clinic before opting for tooth extraction.

Radiographically, J-shaped radiolucent areas may be associated with root fracture. Therefore, endodontic consultation was emphasized in the clinical data of the patients selected in

the current study, and patients who were traumatized, had complications during endodontic treatment, and had data that would cause the possibility of root fracture were excluded from the study. Similar to the previous study [15], the rate of EPL with cone-shaped radiographic findings was found to be high in the current study (63.6%). However, no significant relationship was found between the radiographic shape of EPL and age range, gender, tooth, or arch localization. In addition, similar to previous studies [14, 15], EPL was mostly detected in molars in this study. However, even with the same classification and the same type of radiographic examination being used for EPL, the number of patients, the factors examined, and the study in different populations may have caused different results to be obtained between studies.

In current study, the absence of a restoration or caries in the majority of teeth with EPL was not similar to the previous study [15]. However, the result that this does not have a significant relationship with the grade of EPL should not be ignored. Cucolo et al. [28] examined the prevalence of EPL in molar and non-molar teeth and found the rate of caries or restoration to be high in both groups. These results highlight the need for prioritizing the prognosis and treatment of the tooth rather than its primary source, as suggested by the 2017-Classification, since the primary source of the EPL may vary.

### Limitations

The results of the study should be evaluated with the limitations of the study. This study did not assess the grade of periodontal disease, and the patient's systemic diseases and medications were ignored. Furthermore, due to its retrospective design, the study relied on archival clinical examination data. Other limitations are the small number of samples due to covering a certain period of time, the single centre nature of the study, the lack of CBCT, the lack of extent and distribution for stages, and the fact that the rates of teeth with EPL remaining in the mouth and their prognosis could not be included in the study design. This study aims to emphasize the importance of not ignoring EPL and performing both endodontic and periodontal evaluations. Future prospective and more comprehensive studies, addressing the limitations of the presented study, may contribute to the diagnosis and treatment of these lesions.

### CONCLUSIONS

Prevalence of EPL was 9.62% in this study. Within the limitations of this study, it can be stated that according to the

2017-Classification, the number, grade, radiographic shape, and localization of EPL in periodontitis patients did not differ according to gender and age ranges. EPL was observed more in Stage III periodontitis patients and in mandibular molar teeth, and the rate of EPL-Grade 3 and radiographic images with cone-shaped was higher in these patients.

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**Informed Consent:** Patients who signed an informed consent form were included in this retrospective study.

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**Author Contributions:** Elif Töre Sari: design, fundings, materials, data collection and/or processing, critical review.

Dicle Altındal: conception, design, supervision, analysis and/or interpretation, literature review, writing, critical review.

## REFERENCES

- [1] Evans M (2023) The endodontic-periodontal juncture: Where two worlds meet. An overview of endo-perio lesions. *Aust Dent J.* 68 Suppl 1:S56–S65. <https://doi.org/10.1111/adj.12993>
- [2] Rotstein I (2017) Interaction between endodontics and periodontics. *Periodontol* 2000. 74:11–39. <https://doi.org/10.1111/prd.12188>
- [3] Ardila CM, Vivares-Builes AM (2022) Clinical Efficacy of Treatment of Endodontic-Periodontal Lesions: A Systematic Scoping Review of Experimental Studies. *Int J Environ Res Public Health.* 19:13649. <https://doi.org/10.3390/ijerph192013649>
- [4] Herrera D, Retamal-Valdes B, Alonso B, Feres M (2018) Acute periodontal lesions (periodontal abscesses and necrotizing periodontal diseases) and endo-periodontal lesions. *J Periodontol.* 89:S85–S102. <https://doi.org/10.1002/JPER.16-0642>
- [5] Gambin DJ, Vitali FC, Casanova KAS, DE Carli JP, Mazzon RR, Gomes BPPA, Trentin MS, Duque TM (2024) Prevalence of species of yellow, purple and green microbial complexes in endo-perio lesions: a systematic review. *Braz Oral Res.* 38:e048. <https://doi.org/10.1590/1807-3107bor-2024.vol38.0048>
- [6] Mahajan A, Razi MA, Kundu M, Qamar S, Chandra S, Deep A (2024) Comparative Evaluation of Microbial Flora of Endodontic Origin in Teeth with Endo-Perio Lesions. *J Pharm Bioallied Sci.* 16:S856–S858. [https://doi.org/10.4103/jpbs.jpbs\\_1060\\_23](https://doi.org/10.4103/jpbs.jpbs_1060_23)
- [7] Al-Fouzan KS (2014) A new classification of endodontic-periodontal lesions. *Int J Dent.* 919173:1-5. <https://doi.org/10.1155/2014/919173>
- [8] Takahashi K, Yamazaki K, Yamazaki M, Kato Y, Baba Y (2022) Personalized Medicine Based on the Pathogenesis and Risk Assessment of Endodontic-Periodontal Lesions. *J Pers Med.* 12:1688. <https://doi.org/10.3390/jpm12101688>
- [9] Papapanou PN, Sanz M, Buduneli N, Dietrich T, Feres M, Fine DH, Flemmig TF, Garcia R, Giannobile WV, Graziani F, Greenwell H, Herrera D, Kao RT, Kebschull M, Kinane DF, Kirkwood KL, Kocher T, Kornman KS, Kumar PS, Loos BG, Machtei E, Meng H, Mombelli A, Needleman I, Offenbacher S, Seymour GJ, Teles R, Tonetti MS (2018) Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Periodontol.* 89:S173–S182. <https://doi.org/10.1002/JPER.17-0721>
- [10] Caton JG, Armitage G, Berglundh T, Chapple ILC, Jepsen S, Kornman KS, Mealey BL, Papapanou PN, Sanz M, Tonetti MS (2018) A new classification scheme for periodontal and peri-implant diseases and conditions-Introduction and key changes from the 1999 classification. *J Clin Periodontol.* 45:S1–S8. <https://doi.org/10.1111/jcpe.12935>
- [11] Kuoch P, Bonte E (2020) Endoperiodontal Lesions and Chicago's New Classification of Periodontal and Peri-implant Diseases and Conditions. *J Contemp Dent Pract.* 21:798–802
- [12] Siddiqui AY, Radhan R, Almalki F, Alghamdi F, Alsubhi

- A, Alaamri A, Alzahrani KT (2022) Knowledge and awareness of Endo-Perio lesions among dentists and dental interns in Saudi Arabia. *Med Sci.* 26:1-8. <https://doi.org/10.54905/disssi/v26i121/ms85e2121>
- [13] Khandelwal A, Billore J, Gupta B, Jaroli S, Agrawal N (2020) Knowledge, attitude and perception on endo-perio lesions in practicing dentists- A qualitative research study. *JAMDSR.* 8:31–34. <https://doi.org/10.21276/jamdsr>
- [14] Ruetters M, Gehrig H, Kronsteiner D, Schuessler DL, Kim TS (2022) Prevalence of endo-perio lesions according to the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Disease in a university hospital. *Quintessence Int.* 53:134–142. <https://doi.org/10.3290/j.qi.b2091245>
- [15] Güneç HG, Paksoy T, Atalay C, Aydın K (2023) Retrospective evaluation of the prevalence of endodontic-periodontal lesions on panoramic images in the latest classification of periodontal and peri-implant diseases. *J Health Sci Med.* 6:737–744. <https://doi.org/10.32322/jhsm.1293681>
- [16] Altaf A, Jeelani M, Basher A (2019) Assessment of prevalence of Endo-perio lesions among patients of known population: An observational study. *Int J Appl Dent Sci.* 5:111–113
- [17] Qasim H, Karam B, Mousa H, Mohamed S (2023) Prevalence of Tooth Involved (Perio-Endo) Lesion Among Duhok Population: Across Sectional Study. *JDU.* 26:302–307. <https://doi.org/10.26682/sjuod.2023.26.2.26>
- [18] Slots J (2017) Periodontitis: facts, fallacies and the future. *Periodontol 2000.* 75:7–23. <https://doi.org/10.1111/prd.12221>
- [19] Gautam S, Galgali SR, Sheethal HS, Priya NS (2017) Pulpal changes associated with advanced periodontal disease: A histopathological study. *J Oral Maxillofac Pathol.* 21:58–63. <https://doi.org/10.4103/0973-029X.203795>
- [20] Simon JHS, Glick DH, Frank AL (1972) The Relationship of Endodontic-Periodontic Lesions. *J Periodontol.* 43:202–208. <https://doi.org/10.1902/jop.1972.43.4.202>
- [21] Dako T, Lazăr A, Mărțu M, Lazăr L (2021) Prevalence of Endo-Perio Lesions Among Adult Patients. An Observational Study. *Rom. J. Med. Dent. Educ.* 10:16–21
- [22] Abdullah R, Ayoub S (2023) Prevalence of true combined endodontic-periodontal lesions in adult patients with and without diabetes: A cross sectional survey. *Int J Appl Dent. Sci.* 9:316-319. <https://doi.org/10.22271/oral.2023.v9.i1e.1699>
- [23] Prashaanthi N, Rajasekar A, Shantha Sundari K (2021) Prevalence of Endo Perio Lesion - An Institutional Study. *IJDOS.* 8:2858–2862. <https://doi.org/10.19070/2377-8075-21000580>
- [24] Robo I, Heta S, Haxhiu E, Qirjazi B, Ostreni V (2022) Endo-perio Lesions — Radiographic Diagnosis of Specific Classifications. *SN Compr Clin Med.* 4:211. <https://doi.org/10.1007/s42399-022-01291-1>
- [25] Foce E, Ahmed HMA, Hashem AAR (2022) Classifications and Management of Endodontic-Periodontal Lesions. In: Ahmet HMA and Dummer PMH (eds) John Wiley & Sons, Ltd, pp 591–616.
- [26] Rotstein I, Simon JH (2004) Diagnosis, prognosis and decision-making in the treatment of combined periodontal-endodontic lesions. *Periodontol 2000.* 34:165-203. <https://doi.org/10.1046/j.0906-6713.2003.003431>
- [27] Sălceanu M, Melian A, Dascălu C, Giuroiu C, Concita C, Topoliceanu C, Melian D, Frumuzache A, Solomon SM, Mărțu MA (2025) Endo-Periodontal Lesions in Endodontically Treated Teeth with Periapical Pathology. *Diagnostics (Basel)* 15:1663. <https://doi.org/10.3390/diagnostics15131663>
- [28] Cucolo FCC, Bonvalente MC, Barroso EM, Toledo BECD, Camargo GADCG, Souza, AAE, Zuza EC (2021) Endo-perio lesions prevalence in non-molar and molar teeth: a pilot study. *Rev odontol UNESP.* 50:e20210037. <https://doi.org/10.1590/1807-2577.03721>

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