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# Decision making of the endodontic-periodontal interrelation

# Tomada de decisão da interrelação endodôntico-periodontal

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## ABSTRACT

This present work was aimed at evaluating the clinical knowledge of general practitioners (GPs), attending a specialization course on Endodontics in the cities of Recife - Brazil and João Pessoa - Brazil, as regards the endo-perio lesions, owing to the difficulties, noticed when stablishing their diagnosis and, therefore, when performing the therapeutic decision. On this purpose, a questionnaire with three case-reports, concerned with those lesions, was answered by a sample of 54 GPs. During the interviews, they were inquired on their possible diagnosis and treatment, by means of digitalized radiographies and case decriptions. The results revealed a great range of variation, even higher than what was expected, in reference to the diagnosis and proposed therapies, associated to a low frequency related to the right decision-making. In conclusion, the majority of the interviewed students does not retain the required scientific knowledge towards the studied subject.

**Key-words:** Endodontics, Periodontics, Decision-making.

## 1 INTRODUCTION

Endoperiodontal lesions are defined in the scientific literature as pathological changes that compromise the pulp and periodontal tissues of the same dental element simultaneously, where there may or may not be a cause and effect relationship between the lesions. A pathological condition originating in one of the structures, if left without adequate treatment for a period of time, leads to the destruction of part of the adjacent structure, simulating a false origin of the lesion and making diagnosis difficult for the professional. (LASCALA; PAIVA, 1991, DE DEUS, 1992,

RUIZ; MENDONÇA; ESTRELA, 2001, GUSMÃO, 2003, SANTIAGO; SOARES; PINTO, 2005)

Researchers and clinicians have long recognized the close relationship between the dental pulp and the periodontium. The interdependence of these two tissues is flagrant to the point that they are close and related since the embryonic stage, even with the same vascular supply. The anatomical interrelation of the periodontium and root canal system, through the natural communication routes between these tissues, such as the apical foramen, lateral and accessory canals, as well as the occasional communications between them, characterized by perforations, fractures and dentinal tubules lacking the protection of the root cementum, may justify such a high occurrence of lesions involving these two tissues.

Neves; Barbosa (1994) performed a radiographic analysis of teeth with periodontal lesions, selecting 601 radiographs of teeth with healthy crowns. According to the results, 48.4% of the teeth presented periapical lesions associated with periodontal lesions, proving pulp involvement via periodontium. In view of the above, they suggested meticulous overall case evaluation when diagnosing and planning initially periodontal cases.

Microbiological similarities between infected root canals and advanced periodontitis confirm the possibility of cross infection in these cases. Figueiredo; Toledo; Salvador (2000) agreed with other authors, in their review of the literature, when they stated that in endoperiodontal lesions the microbiota of the root canal is more complex and pathogenic than when the lesion is purely endodontic. As an example, *Spirochetes are* rare organisms in the root canal system, but frequent in periodontal pockets, and are found in cases diagnosed as endoperiodontal lesions. Therefore, these should be considered as a single lesion, regardless of their origin.

Clinical signs such as periodontal pockets, suppuration, fistulas, swelling of marginal gingiva, tooth sensitivity to percussion, increased tooth mobility, and radiographic findings such as angular bone defects, for example, do not result exclusively from periodontal disease associated with plaque, but may also result from irritants present in the root canal system of the affected tooth. Often, the difficulties inherent in diagnosis generate controversy around the subject, leading to the classification as an endo-perio lesion of situations that are characteristically pulpal or periodontal, without any aspect of interrelationship.

Chang; Lin (1997) considered that endodontic lesions may simulate a periodontal lesion both clinically and radiographically as a result of the formation of lesions in the furcation region and drainage of abscesses arising from pulp necrosis through the periodontal ligament region. In these cases, the diagnosis should involve several tests to be made accurately, such as palpation,

percussion and pulp sensitivity, a careful radiographic analysis and knowledge of the patient's medical and dental history, thus avoiding unnecessary treatments that may even harm the health of the dental element in question.

The true simultaneous occurrence of periodontal lesions and pulpal alterations, where there is no defined origin, is not frequent and its etiology is not fully known, being called Endo Periodontal Syndrome by some. This would be characterized by a set of determined and pathognomonic signs and symptoms of a particular disorder, such as the presence of localized periodontal lesion with deep pocket formation involving only one side of the root, mobility incompatible with bone loss or with the severity of the inflammatory response, and irreversible pulp alteration, described as inflammatory pulpopathy, occurring concomitantly. (CHAMBRONE, 1985, LASCALA; PAIVA, 1991, GUSMÃO, 2003)

Several classifications for endodontic-periodontal lesions are proposed in the current scientific literature, in general based on the etiology of these lesions, some being more referenced than others. However, none seems to be complete enough to be considered a standard classification for the subject, which leads to a divergence among professionals regarding the clinical diagnosis and treatment of these lesions.

Vakalis et al. (2005) conducted a pilot study to evaluate the effectiveness of the treatment protocol established for endo-perio lesions. To do so, they selected nine patients diagnosed with true endo-perio lesions and first performed endodontic treatment associated with scaling and root planing of the compromised dental elements. After one month the non-surgical periodontal treatment was repeated to favor the decontamination of the residual pockets. During the evaluation of the results they observed that, despite the limitation of this study, the treatment for these lesions prioritizing endodontics is effective, providing good clinical results and bone support gain in most teeth.

Knowing that the process of solving a clinical problem and the successful resolution of this problem is characterized by two major phases of decision making: the designation of a diagnosis at a level of specificity appropriate for therapeutic considerations and the selection of a treatment that affects the problem in order to solve or alleviate it (NETO, 1998), we decided to analyze, with students of specialization courses in Endodontics in the cities of Recife and João Pessoa, the decision making - diagnosis and therapeutic paradigm - for lesions of endodontic-periodontal involvement, in order to verify what type of concept is being adopted by them in their daily clinical practice.

## 2 MATERIALS AND METHODS

This cross-sectional study was carried out in specialization courses in Endodontics of two Higher Education Institutions of the city of Recife, which are the University of Pernambuco - UPE and the Federal University of Pernambuco - UFPE, of a Class Entity of the city of Recife - Sindicato dos Odontologistas do Estado de Pernambuco - SOEPE, and of two Study Centers of the city of João Pessoa: the Núcleo de Estudos e Aperfeiçoamento Odontológico - NEAO and the Centro Odontológico Especializado - COESP, in the period from November 2005 to February 2006.

The population studied consisted of 60 dental surgeons, students of the selected courses. The choice of this population was due to the fact that they were general practitioners or with postgraduate degrees in other areas of dentistry, but with interest currently focused on endodontics, characterizing a convenience sample.

The students were invited to participate in the research and sign the Informed Consent Form (ICF). Students were explained the objectives of the study and were given all the necessary information to consciously decide about their participation. Students who did not agree to participate in the study and, consequently, did not sign the informed consent form, or were not present at the location of the study on the date scheduled for the research were excluded from the sample.

All data were collected by the author of the research in the selected institutions, by means of a personal interview, whose objective was to obtain information from the students about the diagnosis and therapy to be instituted for the cases presented. In the interview, the researcher used the standardized or structured type of questioning, conducting the questions through a questionnaire.

This questionnaire presented three case scenarios composed of a digitized radiograph and a description of the clinical aspect. Two questions were asked for each case: one about the clinical-radiographic diagnosis of the lesion and another about the therapeutic paradigm of choice for the case. The questions were the same for the three case scenarios and were objective, with five response options for the diagnosis and four response options for the therapeutic paradigm.

### 2.1 CASE SCENARIO 1:

On clinical examination it was observed:

- Presence of pulp sensitivity - characteristic symptomatology of irreversible pulpitis

- Presence of periodontal pocket involving the distal surface of the root

**1) What is the clinical-radiographic diagnosis of this lesion?**

a) Endodontic lesion
b) Periodontal lesion
c) Primary endodontic lesion with secondary periodontal involvement
d) Primary periodontal lesion with secondary endodontic involvement
e) True endo-perio lesion

**2) Which therapy should be instituted?**

a) Endodontic treatment
b) Periodontal treatment
c) Root decontamination + Endodontic treatment + Periodontal treatment
d) Root decontamination + Periodontal treatment + Endodontic treatment

2.2 CASE SCENARIO 2:

On clinical examination it was observed:

- Absence of pulp sensitivity, Pain on horizontal and vertical percussion, Presence of edema in the region of the alveolar mucosa, Absence of periodontal pocket, Absence of fistula

**1) What is the clinical-radiographic diagnosis of this lesion?**

a) Endodontic lesion
b) Periodontal lesion
c) Primary endodontic lesion with secondary periodontal involvement
d) Primary periodontal lesion with secondary endodontic involvement
e) True endo-perio lesion

**2) Which therapy should be instituted?**

a) Endodontic treatment
b) Periodontal treatment
c) Root decontamination + Endodontic treatment + Periodontal treatment
d) Root decontamination + Periodontal treatment + Endodontic treatment

2.3 CASE SCENARIO 3:

On clinical examination it was observed:

- Absence of pulp sensitivity, Presence of fistula, Presence of periodontal pocket of + 10mm on the distal surface of the distal root, Grade I mobility, Presence of horizontal bone resorption compatible with the patient's age

**1) What is the clinical-radiographic diagnosis of this lesion?**

a) Endodontic lesion
b) Periodontal lesion
c) Primary endodontic lesion with secondary periodontal involvement
d) Primary periodontal lesion with secondary endodontic involvement
e) True endo-perio lesion

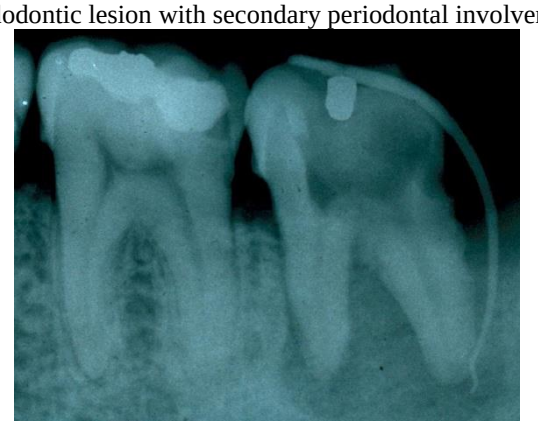
**2) Which therapy should be instituted?**

a) Endodontic treatment
b) Periodontal treatment
c) Root decontamination + Endodontic treatment + Periodontal treatment
d) Root decontamination + Periodontal treatment + Endodontic treatment

Figure 1 - True endopereal lesion (scenario case 1)

Figure 2 - Strictly endodontic lesion (scenario case 2)

Figure 3 - Primary endodontic lesion with secondary periodontal involvement (scenario case 3)



In the data analysis the variables established in the methods of this study were created: Verify the prevalence of the correct clinical-radiographic diagnosis, as well as the correct treatment to be instituted for the cases scenarios.

## 3 RESULTS

Table 1 shows the results of the clinical-radiographic diagnosis and therapy of all 54 students participating in the study according to the scenario. This table shows that: in each case, the percentage of correct answers for the therapeutic diagnosis was higher than the corresponding percentage of correct answers for the clinical-radiographic diagnosis; the percentage of correct answers for the clinical-radiographic diagnosis was lower in case 1 (22.2%) and higher (59.3%) in case 2; the highest percentage of correct answers for the therapeutic diagnosis was recorded in case 2, while the percentage of correct answers in the other two cases were close. Significant differences between the percentages of correct and incorrect diagnoses were registered in the clinical-radiographic diagnoses of cases 1 and 3 and in the therapeutic diagnosis of case 2.

Table 1 - Evaluation of the results of the clinical-radiographic and therapeutic diagnoses, of all students according to the case scenario

| Evaluation | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Case scenario | Evaluation | Right | | Wrong | | TOTAL | | p-value |
| | | | | | | | | |
| **1** | Clinical-radiographic diagnosis | 12 | 22,2 | 42 | 77,8 | 54 | 100,0 | $p^{(1)} < 0.0001$* |
| | Therapeutics | 31 | 57,4 | 23 | 42,6 | 54 | 100,0 | $p^{(1)} = 0.2763$ |
| | | | | | | | | |
| **2** | Clinical-radiographic diagnosis | 32 | 59,3 | 22 | 40,7 | 54 | 100,0 | $p^{(1)} = 0.1736$ |
| | Therapeutics | 39 | 72,2 | 15 | 27,8 | 54 | 100,0 | $p^{(1)} = 0.0011$* |
| | | | | | | | | |
| **3** | Clinical-radiographic diagnosis | 18 | 33,3 | 36 | 66,7 | 54 | 100,0 | $p^{(1)} = 0.0002$* |
| | Therapeutics | 32 | 59,3 | 22 | 40,7 | 54 | 100,0 | $p^{(1)} = 0.1736$ |

(*) - Significant difference at 5.0%.
(1) - Using the chi-square test for equality of proportions.

Table 2 shows the results of decision making (radiographic clinical diagnosis and therapy) by case for the entire sample studied, being considered correct only in the case of correct diagnosis and therapy together. This table shows that the highest percentage (59.3%) of correct decision making was recorded in case 2 and the lowest (16.7%) in case 1. At a level of 5.0% significant differences were recorded between the percentages of right and wrong in cases 1 and 3 ($p < 0.05$).

Table 2 - Decision making assessment (Radiographic and therapeutic clinical decision making) according to the case scenario

| Decision Making | | | | | | | |
|---|---|---|---|---|---|---|---|
| Case scenario | Right | | Wrong | | TOTAL | | p-value |
| | n | % | n | % | n | % | |
| 1 | 9 | 16,7 | 45 | 83,3 | 54 | 100,0 | p(1) < 0,0001* |
| | | | | | | | |
| 2 | 32 | 59,3 | 22 | 40,7 | 54 | 100,0 | p(1) = 0,1736 |
| | | | | | | | |
| 3 | 15 | 27,8 | 39 | 72,2 | 54 | 100,0 | p(1) = 0,0011* |

(*) - Significant difference at 5.0%.
(1) - Using the chi-square test for equality of proportions .

## 3.1 EVALUATION OF RECIFE'S STUDENT RESULTS

The results contained in Tables 3 and 4 refer to the 35 students from the city of Recife only. Table 3 analyzes the results of diagnosis and therapy, while Table 4 analyzes decision making (diagnosis + therapy together)

Table 3 - Evaluation of the results with the students in **Recife** according to the case scenario

| Evaluation | | | | | | | |
|---|---|---|---|---|---|---|---|
| Case scenario | Evaluation | Right | | Wrong | TOTAL | | p- value |
| | | % | n | % | n | % | |
| **1** | Clinical-radiographic diagnosis | 20,0 | 28 | 80,0 | 35 | 100,0 | $p^{(1)} = 0,0004$* |
| | Therapeutics | 57,1 | 15 | 52,9 | 35 | 100,0 | $p^{(1)} = 0,3980$ |
| **2** | Clinical-radiographic diagnosis | 51,4 | 17 | 48,6 | 35 | 100,0 | $p^{(1)} = 0,8658$ |
| | Therapeutics | 68,6 | 11 | 31,4 | 35 | 100,0 | $p^{(1)} = 0,0280$* |
| **3** | Clinical-radiographic diagnosis | 34,3 | 23 | 65,7 | 35 | 100,0 | $p^{(1)} = 0,0630$ |
| | Therapeutics | 62,9 | 13 | 37,1 | 35 | 100,0 | $p^{(1)} = 0,1282$ |

(*) - Significant difference at 5.0%.
(1) - Using the chi-square test for equality of proportions .

Table 4 shows that: in each case, the percentage of correct answers for the therapeutic diagnosis was higher than the corresponding percentage of correct answers for the clinical-radiographic diagnosis; the percentage of correct answers for the clinical-radiographic diagnosis was lower in case 1 (20.0%) and higher (51.4%) in case 2; the highest percentage of correct answers for the therapeutic diagnosis was found in case 2, while the percentage of correct answers in the other two cases were similar (57.1% in case 1 and 62.9% in case 2). At a 5.0% significance level, significant differences were recorded between the percentages of correct and incorrect clinical-radiographic diagnosis in cases 1 and 3 and therapeutic diagnosis in case 2 ($p < 0.05$). Thus, Table 4 shows that among the Recife students the results of decision making (clinical-radiographic diagnosis and therapy) per case. This table shows that the highest percentage (51.4%) of correct decision making was recorded in case 2 and the lowest (17.1%) in case 1. At the 5.0% level significant differences were recorded between the percentages of right and wrong in cases 1 and 3 ($p < 0.05$).

Table 4 - Decision making assessment (Radiographic and therapeutic clinical decision making) according to the case scenario

| Evaluation | | | | | | | |
|---|---|---|---|---|---|---|---|
| Case scenario | Right | | Wrong | | TOTAL | | p-value |
| | n | % | n | % | n | % | |
| **1** | 6 | 17,1 | 29 | 82,9 | 35 | 100,0 | $p^{(1)} < 0,0001$* |
| **2** | 18 | 51,4 | 17 | 48,6 | 35 | 100,0 | $p^{(1)} = 0,8658$ |
| **3** | 10 | 28,6 | 25 | 71,4 | 35 | 100,0 | $p^{(1)} = 0,0112$* |

(*) - Significant difference at 5.0%.
(1) - Using the chi-square test for equality of proportions .

## 4 DISCUSSION

The term endoperiodontal lesion is vague due to the fact that it does not differentiate between lesions that are primarily endodontic, primarily periodontal or lesions produced by

undefined factors that together would characterize the so-called Endoperiodontal Syndrome or true endoperiodontal lesion. The development of these lesions has been attributed to the presence of numerous access routes between the pulp and periodontal tissues.

Histological observations show that the presence of intercommunications allows both the periodontal infection via pulp, characterizing a retrograde periodontitis, as the pulp infection via periodontium, giving rise to a picture of retrograde pulpitis (BENDER; SELTZER, 1972, LANGELAND; RODRIGUES; DOWDEN, 1974, BARKHORDAR; STEWART, 1990, KOBAYASHI et al., 1990, DEUS, 1992). However the first involvement cited is more commonly accepted by researchers, since there is a vast literature favoring this viewpoint.

Most authors (BARKHORDAR; STEWART, 1990, LASCALA; PAIVA, 1991, EHNEVID et al., 1993a, EHNEVID et al., 1993b, JANSSON et al, 1995, CHANG; LIN, 1997, WEINE, 1998, RUIZ; MENDONÇA; ESTRELA, 2001, GUSMÃO, 2003, SANTIAGO; SOARES; PINTO, 2005) concluded in their studies that the lack of preparation of these lateral and accessory canals can lead to the formation of periapical or periradicular lesions that, if detected and treated correctly will have their repair in a relatively short period of time; However, if not treated in a timely manner, they may lead to plaque and tartar accumulation on the external surfaces of the tooth, inducing the formation of a pathological periodontal condition in the patient, or, if the patient is already affected by generalized periodontal disease, these lesions of pulp origin may increase the degree of fiber disorganization, worsening the symptomatology, hindering the treatment of the marginal lesion and worsening its prognosis.

Ehnevid et al. (1993a) evaluated the results of periodontal treatment against pulpal pathology. When comparing the healing pattern of the periodontium after periodontal therapy of teeth with and without pulpal disease, they concluded that root infection evident as periapical radiotransparency may delay or impair periodontal healing.

In relation to retrograde pulpitis, there is a divergence of authors regarding the extent of pulp damage that may occur due to an untreated lesion in the supporting tissues adjacent to the compromised tooth. Langeland, Rodrigues and Dowden, 1974, Torabinejad and Kiger, 1985, Berg, Blomlof and Lindskog, 1990, Borba et al. 2002, among others, believe that as long as the nerve vascular bundle in the region of the apical foramen is not affected by the marginal periodontal lesion, severe and irreversible damage to the dental pulp will not occur, since in some studies conducted on this subject some foci of localized pulp inflammation, irregular dentin production, calcification and resorption were observed.

In controversy, research by Bender; Seltzer (1972) suggested that the presence of an associated condition between caries lesions and marginal periodontal disease has higher rates of painful symptoms compared to those free of periodontal disease, and worse prognoses for the patient's overall health, as well as the presence of periapical or periradicular radiolucent lesions in teeth with healthy crowns of patients with generalized periodontal disease was observed in a study of radiographic analysis, proving pulp involvement via the periodontium. (NEVES; BARBOSA, 1994)

Microorganisms characteristic of periodontal lesions were found in necrotic pulp tissue of teeth with healthy crowns, making it evident that in endoperiodontal lesions the microbiota of the root canal system is more complex and virulent than in purely endodontic lesions (KOBAYASHI et al, 1990, KEREKES; OLSEN, 1990, FIGUEIREDO; TOLEDO; SALVADOR, 2000) A study of induced periodontitis in animals also showed the presence of necrotic foci and hyaline degeneration in healthy teeth (SALLUM et al., 1993).

Some authors (SIMON; GLICK; FRANK, 1972, SOARES; BITTENCOURT; TAVARES, 1998, FAVIERI; PIACSER; FREITAS, 1999, LAMBERTI et al., 2000, MARTINS et al., 2004, ANAND; NANDAKUMAR, 2005) consider the true endodontic-periodontal involvement as being that which comes from the coalescence of two isolated lesions in the same tooth, originating a single lesion.

The differential diagnosis between endoperiodontal lesions of pulpal origin and those of periodontal origin is not always easy, since in many cases patients present clinical signs and report symptoms compatible with both lesions. It is clear, therefore, that numerous clinical tests such as palpation, percussion and pulpal sensitivity, a careful radiographic analysis and knowledge of the patient's medical and dental history are necessary for a correct diagnosis to be made, as well as the most appropriate treatment for each case to be instituted and the prognosis of the case to become favorable. (PAUL; HUTTER, 1997, ROSSI, 2002)

The differential diagnosis of endoperiodontal lesions with root fractures, iatrogenic perforations and diseases of the pulp and periodontium alone must also be made with caution in order to minimize unnecessary treatment, which ends up compromising the tooth in question (LINDHE, 1992, MORAES, 1996, CHANG; LIN, 1997, ZUZA; TOLEDO, 2001)

In this study, when performing a literature review on the topic of endodontic-periodontal lesions, we found that there is no single classification for these lesions. What happens are several classifications proposed over the years of research by several different authors, who generally relate their way of grouping these lesions to their etiology.

The most referenced classification in the literature, however, is the one proposed by Simon; Glick; Frank (1972), which classifies endodontic lesions into primary endodontic lesion, primary endodontic lesion with secondary periodontal involvement, primary periodontal lesion, primary periodontal lesion with secondary endodontic involvement and true endodontic lesion, where the latter would describe a clinical picture characterized by pulp necrosis and deep pockets, assuming that pulpal and periodontal lesions occur independently in the same tooth, progressing until they unify to produce a radiographic image where it is not distinguished which lesion is characterized as the cause and which would be characterized as the consequence. Authors such as De Deus (1992), Lindhe (1992), Paul; Hutter (1997), Lamberti et al. (2000), Arróniz (2003), Anand; Nandakumar (2005) adopt this classification.

Another classification that draws attention is that proposed by Lascala and Paiva (1991), which in addition to describing the lesions considered involvements where there is a cause and effect relationship between the pathological conditions, highlights the definition of Chambrone (1985) for the so-called true endoperiodontal lesion as being characterized by a series of grouped and pathognomonic factors such as the presence of periodontal pocket, accentuated mobility not compatible with bone loss discernible on radiographs and inflammatory pulp disease, making it a clinical picture different from others. Corroborating this classification, Gusmão (2003) states that there are two types of combined pathology between periodontal and pulp tissues: The first, considered as involvement where there is a cause and effect relationship between the lesions, justified by the presence of the communication routes between the said tissues; and the second type of pathological relationship, this being infrequent, characterized by well-defined clinical signs, such as intense pulp pain caused by inflammatory pulpopathy, periodontal pocket and marked tooth mobility not compatible with the bone loss visualized by radiographic examination, there being a true fusion between the two lesions, making their diagnosis difficult.

Torabinejad; Trope, in 1997, classified these lesions in order to divide them into periodontal lesions of endodontic origin, periodontal lesions of periodontal origin, and true associated lesions that would present as two concomitant lesions on the same tooth and may communicate or not. One year later, Weine (1998) proposed a classification that related the signs and symptoms to the origin of the lesion, subdividing them into Class I, where the symptoms simulate, by clinical and radiographic observation, a periodontal disease, but are actually caused by inflammation and/or pulp necrosis; Class II, when the tooth has a pulp or periapical disease concomitant with a periodontal disease; Class III, when the tooth has no pulpal problem, but needs endodontic treatment associated with a root amputation, to achieve periodontal healing; and Class

IV, representing the cases that simulate, by clinical-radiographic observation, a pulp or periapical disease, but that in reality characterize a periodontal disease.

In turn, some authors disagree regarding the classification, such as Ruiz; Mendonça; Estrela (2001), who suggested a distinct classification for endoperiodontal lesions based on their origin and according to the patient's risk for periodontal disease, since the author considered that the greater the periodontal involvement of the patient, against the endodontic, the worse the prognosis of the case. Dividing the endoperiodontal lesions into lesions of endodontic origin - redividing this to patients with local risk, systemic or both for periodontal disease, and patients at no risk for periodontal disease, and lesions of periodontal origin - resulting from local risk factor, systemic or associated, and Walker (2001) who grouped in his classification lesions of endodontic origin that cause damage to the periodontium being these temporary or permanent with the denomination of endodontic lesion; To those of periodontal origin with pulpal repercussion or not, he calls periodontal lesion, and adds in his classification the iatrogenic lesions, usually endodontic as truly endoperiodontal lesions.

As a result of this divergence among authors on how to classify this type of associated lesion, the clinical difficulties of diagnosis become frequent, which leads dental professionals and students to consider this a difficult subject to understand, making the diagnosis and treatment decision variable issues, not based on scientific evidence.

Faced with this situation of difficulty in decision-making in cases of endoperiodontal lesions, this research sought to analyze what type of concept is being taken into consideration by current students of specialization in Endodontics. Thus, it was observed a lack of agreement between the diagnoses proposed by those surveyed for lesions presented in scenarios, which can be justified by the variety of classifications for the same lesion, associated with the lack of knowledge on the subject.

When it comes to the treatment of these pathological conditions that relate the pulp to the periodontium, it is certain that the correct diagnosis will define the most appropriate treatment for each case, since it is very common to misclassify pulpal or periodontal conditions as endoperiodontal lesions.

For those in which it is observed characteristics of pulpal lesion only, but that presents periodontal repercussions, such as abscess drainage via sulcus, the authors generally state that it should only be performed a radical endodontic treatment and it is expected a repair of the picture in time compatible with the extension of the periodontal lesion, being therefore considered temporary and not justifying its classification as endo-perio lesion. (LASCALA; PAIVA, 1991,

DE DEUS, 1992, LINDHE, 1992, CHANG; LIN, 1997, PAUL; HUTTER, 1997, WEINE, 1998, LAMBERTI et al, 2000, ARRÓNIZ, 2003, ANAND; NANDAKUMAR, 2005) Based on this idea, this research analyzed the opinion of specialization students in Endodontics, presenting them with a case scenario of strictly endodontic lesion with temporary repercussion in the periodontium, and observed that 72.22% of respondents would only perform the endodontic treatment, however, 18.52% would associate the endodontic treatment with periodontal, which in this case would be considered unnecessary.

In cases of patients with generalized periodontal disease who, during or after treatment, show mild to moderate pulp sensitivity, it is also recommended that proservation be performed, sparing that tooth from pulp excision, which could become a negative factor for reinsertion of periodontal ligament fibers, as noted by Lindhe (1992), Fachin; Luisi; Borba (2001), Walker (2001), Borba et al. (2002), and Arróniz (2003).

In cases of severe symptoms or detection of a picture of pulp necrosis associated with periodontal problem, the combined treatment is recommended by several researchers, (BENDER; SELTZER, 1972, LASCALA; PAIVA, 1991, NEVES; BARBOSA, 1994, WEINE, 1998, RUIZ; MENDONÇA; ESTRELA, 2001, FACHIN; LUISI; BORBA, 2001, WALKER, 2001, HAUEISEN; HEIDEMANN, 2002, ARRÓNIZ, 2003, VAKALIS et al., 2005) and should be initiated by Endodontics so that the endodontic lesion, when present, is cured and promotes maximum repair of periodontal fibers and structures before performing advanced periodontal treatment, since the prognosis of cases in general are related to the severity of periodontal disease that affects the patient.

In cases diagnosed as primary endodontic lesion with secondary definitive periodontal involvement, with formation of periodontal pockets by apical migration of plaque and tartar, the treatment of choice should also be combined, prioritizing once again the Endodontics to prevent recurrences of localized periodontitis and avoid unnecessary wear of the tooth structure in its external portion. (BARKHORDAR; STEWART, 1990, LASCALA; PAIVA, 1991, EHNEVID et al, 1993a, EHNEVID et al., 1993b, JANSSON et al., 1995, ABBOTT, 1998, HAUEISEN; HEIDEMANN, 2002, ARRÓNIZ, 2003, VAKALIS et al., 2005, BRITAIN et al., 2005)

In both cases cited (endo-perio lesion or perio-endo lesion) the initial periodontal treatment as supragingival root decontamination can be performed before endodontic treatment to better suit the oral environment and minimize bacterial contamination in the area to be treated. Advanced periodontal treatment can be initiated during the changes of intra-canal medication or at the end of

endodontic treatment, this issue is at the discretion of the professional. In this regard, this study showed that 59.26% of the respondents agreed with this procedure.

In cases of true endoperiodontal lesions where the origin of the lesion is not defined, the combined treatment is also recommended by Lascala; Paiva (1991), Tseng et al. (1996), Abbott (1998), Soares; Bittencourt; Tavares (1998), Favieri; Piacser; Freitas (1999), Lamberti et al. (2000), Fachin; Luisi; Borba (2001), Gusmão (2003), Arróniz (2003), Martins et al. (2004), Vakalis et al. (2005), Anand; Nandakumar (2005), among other authors, emphasizing that intra-canal medication should be changed until periodontal treatment is completed and the prognosis for the case is considered favorable, allowing obturation of the canal system. (ABBOTT, 1998)

Recent studies propose as periodontal surgical treatment the opening of a flap for root debridement associated with the use of an inorganic matrix of bovine bone to fill the bone defects caused by the lesion, and the adaptation of a resorbable collagenous membrane, justifying that the reinsertion of fibers and the bone gain in the marginal crest height reach values significantly higher than those reached in the treatment of only open scraping (TSENG et al., 1996, BRITAIN et al., 2005).

The final sample was characterized by 54 students of Specialization in Endodontics, 33 of these in the city of Recife and 21 in the city of João Pessoa. The female gender was the majority, represented by 42 students and only 12 male students. The ages of the interviewees ranged from 23 to 66 years, with a mean of 27 years. Although 24.07% of the sample (13 students) correctly diagnosed the regarding the treatment decision for the cases presented to the students participating in this research, the authors observed that, in general, professionals are aware that the treatment of endoperiodontal lesions should be performed in a combined manner, however they do not seem to be sure about the most indicated sequence to perform it. It was also verified the high frequency of unnecessary treatments, and also that most of the researchers were not able to correlate the correct diagnosis with the sequence of treatment indicated for each case.

For the case scenario 1, 24.07% of the respondents were successful in diagnosing the lesion presented as a true endo-perio lesion, and 57.41% indicated the combined endodontic and periodontal treatment for this lesion, however only 18.52% related the correct diagnosis with the treatment of choice indicated by the scientific literature. In the results of case scenario 2, it was found that slightly more than half of the respondents (59.26%) correctly associated diagnosis and treatment. And finally, for scenario case 3, only 27.77% of the students were successful in their decision making. This analysis of the results proves the lack of knowledge among professionals,

students of the specialization courses selected for this research, regarding the theme addressed here.

That said, and in order to help clarify the issue for professionals, as well as in the teaching-learning process, the authors of this research suggest a classification for lesions of endodontic-periodontal involvement, based on the principle that strictly endodontic or periodontal lesions with temporary repercussions on adjacent tissue should not be part of the classification of endoperiodontal lesions, since, when treated alone, i.e., without associated treatment, there is complete repair of the injured structures.

In view of this, the endoperiodontal lesions would be classified as:

- Periodontal lesion of pulp origin - This is when, in cases of drainage of purulent secretion via the periodontal sulcus, the lack of endodontic treatment for a prolonged period of time favors the continuous deposit of plaque and tartar, promoting the onset or worsening of a periodontal process with formation of pockets and apical migration of the supporting structures.
- Endodontic lesion of periodontal origin - Characterized by irreversibly altered, or even negative, responses to pulp sensitivity tests on teeth free of caries or extensive restorations, in the face of a picture of generalized periodontal disease of the patient that justifies the involvement of large volume lateral canals or compression of the apical vascular-nerve bundle of the compromised tooth, leading to invasion of the healthy pulp tissue by periodontopathogenic bacteria and their toxic products.
- True endoperiodontal lesion - This is a rare lesion, of still unknown etiology, which presents well-defined clinical characteristics such as: Absence of caries or restorations in the compromised tooth, absence of evident occlusal trauma, presence of periodontal pocket on one side only, exaggerated dental mobility not compatible with bone loss and irreversible pulpitis symptoms. In these cases there is a true fusion between the two lesions, and it is not possible to identify a cause and effect relationship.

Regarding the treatment of these lesions, the authors suggest that it should be performed in an associated manner for all of them, always prioritizing Endodontics, in order to avoid recurrence of periodontal lesions and, consequently, unnecessary wear in the cementum of the dental element. Supragingival root decontamination can be performed prior to endodontic treatment in order to better adapt the oral environment for the following procedures. With the repair of the largest

possible extension of tissue through the obturation of the root canal system and the beginning of regression of periapical lesions, the professional may indicate a conservative or more radical periodontal treatment, in this case, the adoption of surgical procedures.

## 5 CONCLUSIONS

In view of the results obtained in the present research, it seems licit to conclude that:

- Most of the students surveyed did not have the scientific knowledge to properly diagnose and therefore treat a case of a true endo-perio lesion.
- Regarding the strictly endodontic lesion, successful decision making was achieved by a large portion of the respondents.
- Faced with a primary endodontic lesion with secondary periodontal involvement, the students surveyed differed widely on the classification, and a minority adopted the correct decision making for the case.
- In the total group, the number of students surveyed who were successful in making the correct differential diagnosis between the three lesions presented and indicating the appropriate therapeutic paradigms according to the scientific literature was very low.

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