CORONAL-RADICULAR AND PERIODONTAL COMPLICATIONS IN CASES OF TEETH WITH ENDODONTIC TREATMENTS IN MEDICAL RECORDS

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Abstract:
INTRODUCTION: to present the bring to attention the coronal – radicular and periodontal changes that might occur in time, at the level of teeth that, have suffered an endodontic treatment in their medical history. At the same time, some accidents have been monitored, that are likely to occur during endodontic treatment.
MATERIAL AND METHOD: In order to follow these dental-periodontal changes a retrospective study has been performed. A number of 470 retrovalveolar, isometric and ortoradial radiographies have been analyzed. Teeth on these radigraphies have been divided into two groups.
RESULTS: After analyzing the qualities of radicular obturations we have obtained the following results: correct 46%, incomplete 37%, with trans-passing 6%, false path 1%, un-obturated 5%. After analyzing those results by teeth groups, the highest rate of correct obturations that we have discovered was in case of the frontal group (55%), and the highest rate of incomplete obturations in cases of molars (40%). The aspect of apical periodont in cases of teeth with endodontic treatment was as follows: 65% with no changes, 24,5% periodical granuloma , 9,5% a slight widening of the periodical space and 1% radicular cyst.
CONCLUSIONS: The incidence of cases when teeth with endodontic treatment that require a new endodontic intervention is quite increased.

Key words: endodontic, dental-periodontal, coronal-radicular.

INTRODUCTION

The present research intends to identify the coronal-radicular and periodontal modifications which might appear in time at the level of teeth which suffered an endodontic treatment in medical records, as well as the identification of various risk factors which contribute at their appearance. This work tries to accomplish a statistics of the number of correctly obturated radicle channels, as well as of the incorrectly obturated channels, and of their consequences.

MATERIAL AND METHOD

In order to pursue dental and periodontal modifications of teeth which were subjected to an endodontic treatment was done in retrospective study. 470 retroalveolar, isometric, ortoradial radiographies were done. The radiographies were analyzed with a negatoscope. The teeth from these radiographies were divided in two groups. 319 teeth make part from group 1 (Endo) representing endodontic treatments, with a total of 504 channels. The radiographies were done within 6 months - 3 years from the achievements of the channel obturations. 450 teeth are part of group 2 (Vitali), without endodontic treatment, considered vital.

The teeth from both lots were evaluated from a point of view of the coronal-radicular modifications and of the apical periodontitis. Within the coronal-radicular modifications, we followed the coronal and radicular fractures, the relapses of decay and secondary decays, radicular resorptions. Within the apical periodontitis, we analyzed the presence of the enlargement of the periradicular space as skullcap (radiological image of chronical fibrous apical periodontitis), presence of granulomas and cyst. Conventionally, the radiotransparence image over 0,5 cm was considered a cyst, and under 0,5 cm a granuloma.

On the other hand, we analyzed also the correctness of radicular obturations, with relations to their length and tightness. The channel obturation was considered incomplete if this was finished at more than 2 mm in comparison to the radiological apex, correct, at 0-2 mm towards the radiological apex or exceeding if the obturation material passed over radiological apex (in compliance to the criteria of the European Society of Endodontology). The radicular obturation was

considered tight if it had a uniform density, without porosities and free spaces.

From the point of view of the **odontal statute,** the teeth of the two lots were divided as such (table I):

RESULTS AND DISCUSSIONS

TABLE I.
Odontal statute of the teeth from the two lots

Odontal status	Endo	Vitaly
Prostethic restoration	188	105
Coronal obturation	131	204
No restoration	-	141
Total	**319**	**450**

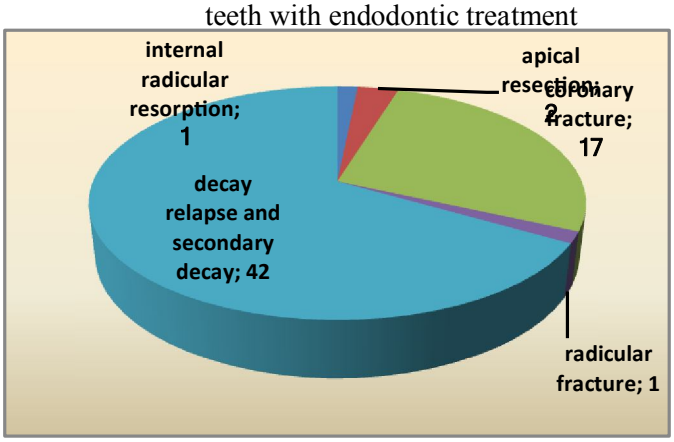
The coronal modifications analyzed at the teeth with coronal obturations of the two lots were the coronal fracture and secondary decays, respectively the decay relapse. The frequency of coronal fracture at the endodontically treated teeth is 12.9% (17 cases), and 1.9% (4 cases) at the ones which were not treated. This significant difference may have as cause the low mechanical resistance of the de-pulped teeth, through the fragility of the organic component, sacrifice exaggerated by the rough dental substance for easing the access and the voluminous obturations of mix. In which concerns the frequency of secondary decays and decay relapses, the difference between the two lots is not significant: 32% (42 cases) at the Endo lot and 30% (61 cases) at the Vitali lot (table II). The similar values may be explained through the common etymology of these decays in both cases: lack of beveling and finishing of the margins, lack of complete elimination of the altered dentine.

The following graphic (fig. 1.) shows the coronal modifications next to the **radicular** ones revealed at the teeth of Endo group.

TABLE II.
Coronal modifications analyzed at the two lots

	Endo		Vitaly	
	No	Percentage	No	Percentage
Coronal fracture	17	12.9%	4	1.9%
Relapse of decay /secondary decays	42	32%	61	30%

Fig. 1. Coronal-radicular modifications teeth with endodontic treatment



Analyzing the **quality of radicular obturations** at the teeth from the Endo lot, the results indicated that 228 (46%) channels had a correct obturation, 187 (37%) presented incomplete obturations, 31 (6%) channels had obturations in excess, 10 (2%) channels were obturated non-tight, 27 (5%) channels were not obturated at all, in 4 (1%) cases we found a channel obturation on a false way, in a case we noticed the radicular perforation fiven by a DCR, and in 16 (3%) cases the apical area was not correctly analyzed (tab. III).

Through the analysis of the quality of separate obturations **on groups of teeth** we obtained the following results (tab. IV), (tab. V), (tab. VI):

TABLE III.
Quality of radicular obturations

Radicular obturation	Number	Percentage
Correct	228	46 %
Incomplete	187	37 %
In excess	31	6 %
Non-tight	10	2 %
False way	4	1 %
Non-obturated	27	5 %
Radicular perforation	1	0 %
Inconclusive	16	3 %
Total	**504**	**100 %**

TABLE IV.
Quality of radicular obturations at the incisor-canine group

Radicular obturation	Number	Percentage
Correct	82	55 %
Incomplete	48	32 %
In excess	10	7 %
Non-tight	4	3 %
False way	2	1 %
Radicular perforation	1	1 %
Inconclusive	1	1 %
Total	**148**	**100 %**

TABLE V.
Quality of radicular obturations at premolars

Radicular obturation	Number	Percentage
Correct	58	45 %
Incomplete	48	38 %
In excess	12	9 %
Non-tight	3	2 %
False way	2	2 %
Non-obturated	2	2 %
Inconclusive	3	2 %
Total	**128**	**100 %**

TABLE VI.
Quality of radicular obturations at molars

Radicular obturation	Number	Percentage
Correct	88	39 %
Incomplete	91	40 %
In excess	9	4 %
Non-tight	3	1 %
Non-obturated	25	11 %
Inconclusive	12	5 %
Total	**228**	**100 %**

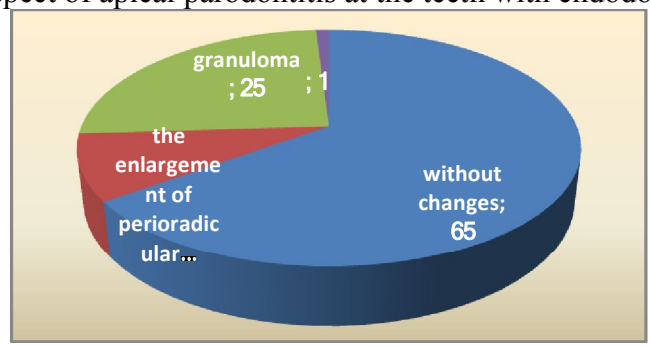
Looking at these results from an objective point of view, the lowest value obtained at molars might be due to a series of morphological and topographical features, such as their posterior position on the arcade, reduced visibility, more difficult accessibility, complicated and multiple radicular and channel morphology with frequent deviations from normal, supranumeral channels and emphasized curves. The most frequent example is the presence of the MV2 channel at the first superior molar.

In the frontal area, the endodontic treatment is made easier, the access being direct, good visibility, an adequate isolation may be done and the channels are unique, usually straight, or with slight curves.

From the 769 teeth analyzed 137 (17,8%) presented **modifications of the apical parodontitis**, in the sense of the appearance of the radiotransparence areas characteristic for chronic apical parodontitis (fibrous PAC, granuloma, cyst). From the lot 1 (Endo) the image of 112 (35%) of teeth suggested the presence of PAC, as follows (fig. 2). From adding the various forms of apical parodontitis results a percentage of 35% of the frequency of PA at the teeth with endodontic treatment. This value is situated between the values of the results of certain studies done in various countries of the world, being closer to the results

obtained in France, Belgium, Germany, USA (1, 2, 3, 4).

Fig. 2. The aspect of apical parodontitis at the teeth with endodontic treatment



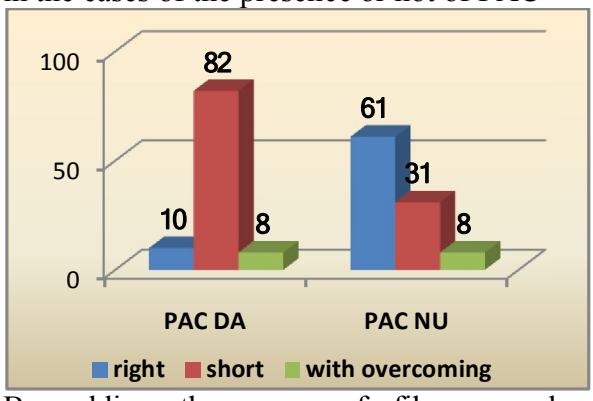
If we take as favoring factor of the appearance of chronic apial parodontitis the quality of endodontitic obturation, then the results point out that there are indeed very important statistical differences between an incomplete endodontic treatment and a complete one.

We made a comparison between the quality of radicular obturations in the case of the presence and absence of chronic apical parodontitis. The four cases of cyst granuloma were not taken into account (fig. 3).

Noticing the results of these comparisons, 82% from the teeth which represented the chronic apical parodontitis had incomplete channel obturations and only 10% had channel obturations considered correctly done. From the teeth with periapical modifications 61% presented radicular obturations correctly done and 31% had incomplete channel obturations. We have to mention here that it is possible that from the teeth with incomplete channel obturations some might have a favorable evolution of the infectious periapical process, as well as, most probably, this will happen with most of the cases which present a correct obturation, after an endodontic treatment correctly done, but probably recent.

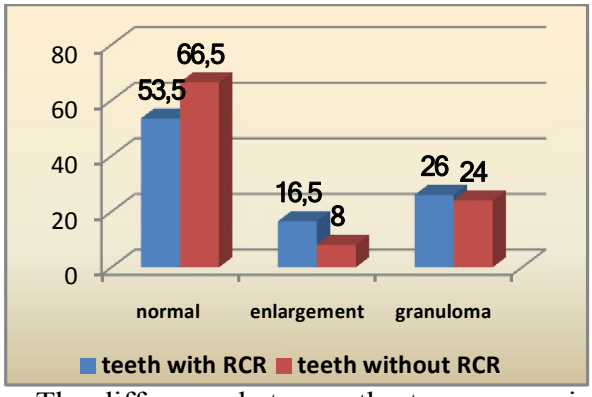
54 (17%) from the teeth of the first lot presented **coronal-radicular reconstitutions (RCR)**, from which 30 were DCR (coronal-radicular device) and 24 pivots type Dentatus. This percentage is significantly reduced than the values obtained through studies done in France (26%) and Sweden (59.4%) (fig. 4) (1,5).

Fig. 3. Quality of channel obturations in the cases of the presence or not of PAC



By adding the cases of fibrous and granulous PAC cases we obtain a percentage of 42.5% at the teeth with RCR and 32% at those without reconstitutions.

Fig. 4. Comparison of the apical parodontitis state of the teeth with RCR and without RCR



The difference between the two groups is not statistically significant. A study regarding the quality of endodontic treatment in Frace[1] revealed an incidence

of 28,6% of PAC at the teeth which had a DCR, meanwhile other authors found values of 16% , 71%, 77% of PAC at this type of teeth (1, 6, 7, 8).

In various studies was taken into discussion the possibility to reinfect the endodontic space when achieving the preparation for DCR, especially that in the last period it is more well-known the negative role of the coronal microinfiltration in the failure of endodontic treatment. In these studies was also analyzed the effect of mechanical preparation in the radicular channel, in order to achieve the space for DCR, and the idea that, due to the vibrations of rotating instruments obtained the adhesion is affected (with a low value) of the endodontic sealing at the walls of the radicular channel walls (9, 10, 11).

CONCLUSIONS

1. The number of teeth endodontically treated which require an endodontic reintervention is high.
2. The qualitative level of endodontic treatments is a low one, locally and worldwide.
3. The highest frequency of incorrect obturations was found in molars.
4. The PAC frequency at the teeth with endodontic treatment is higher than at those without radicular obturations.
5. The teeth with endodontic treatment are associated frequently with PAC, especially at those with incorrectly done radicular obturations (especially those with a length of over 2 mm shorter of apex).
6. The coronal modifications appeared at the teeth with radicular obturations have a medium frequency, but higher than at the untreated teeth.
7. A low percentage of the teeth with endodontic treatment were coronal-radicular redone.
8. The preparation for the application of a DCR cannot have a negative role through the stimulation of appearance of chronic apical parodontitis, and in the worst case may lead to some radicular perforations. Thus we can notice the importance of the accomplishment of the space for DCR immediately after the endodontic treatment when the clinician is familiarized with the anatomy of the respective radicular channel. In which concerns the chronic radicular parodontitis, their negative factor remains an inadequate endodontic treatment, followed by an incomplete channel obturation.
9. From an objective point of view, the endodontic failures are due to the presence of bacterial colonies, and in order to obtain a cure of the lesions of endodontic origin we have to eliminate or decrease them at the level of the radicular channel systems. Also, it is necessary to eliminate the nourishing support for these bacteria and the endodontic level. The coronal restoration must protect what was obtained through apical sealing.
10. From a subjective point of view, the doctor's abilities and his professional training highly influence the quality and prognosis of an endodontic treatment. The correct preparation of the channel and the learning of a correct radicular obturation technique are indispensable for an adequate result.

The endodontic status of the population would be better if the doctors would make an endodontic treatment with max. 2 mm shorter towards the radiological apex, and then they would make in antiseptic conditions (isolation with diga) the coronal restorations.

11. The accidents and incidents which appear during the endodontic treatment are as a consequence of not knowing in detail the morphology of the teeth and especially the morphological options for each tooth, correlated with the topography of the areas surrounding the tooth, of using an inadequate instrument and an incorrect working technique.
12. The indicators found show the importance of obtaining a competence in endodontitis and the training of as more specialists as possible in endodontitis.

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