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Regression of low predictability periapical lesion through endodontic treatment in a single session: case report

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Abstract— *The endodontic treatment aims to heal the periapical tissues after the elimination of infected remains of the root canals systems, providing function to the tooth in oral environment. However, the prevalence of failure in these treatments becomes common, occasioning discomfort to the patient, due to the emergence of extensive lesions in the periodontium and painful symptomatology, consequently. In this way, the endodontic should plan comprehensively, analyzing all the diagnostic possibilities, treatment and prognostic. Basing on this, this study aims to report a case, about these perspectives, in what an extensive lesion in the periapex, of low predictability, regressed one year after conventional endodontic treatment in a single session. For this treatment we opted for radiographic methods and computerized tomography for diagnostic and control of the lesion. Therefore, basing on the therapeutic success of this case, it was verified that a precise diagnostic with an indicated endodontic treatment, can avoid an unnecessary surgical intervention and enable a favorable prognostic long-therm.*
***Keywords*—endodontic; apical periodontitis, single session.**

I. INTRODUCTION

The endodontic treatment consists in preventing and treating the periapical pathologies to provide a higher function and longevity to the tooth and periodontium. However, these authors emphasize that the prevalence of failures in the endodontic treatment is relatively high, and they can emerge with an inadequate chemical-mechanical prepare, iatrogenic, or reinfection of the root canals system in the direction of crown-apex, when the coronary sealing is unsatisfactory or when there are vertical fractures. In this perspective, failures in the endodontic treatment can causing the emergency of periapical lesions, that are polymicrobial, because it involves a combination of gram-positives and gram-negatives facultative anaerobic and strictly anaerobic bacteria. Thus, the endodontist should plan to base on methods of safe and efficient diagnostic, to choose the less aggressive treatment form and enable therapeutic success [1-4].

Normally, in the dental clinic, the intraoral radiography is the most used method to evaluate the periapical bony repair. However, that this method gives limited bi-dimensional information about size, extent and location of periapical lesion. Basing on the negative point of intraoral radiography, the conical beam computerized tomography (TCCB) becomes one of the safety methods of diagnostic and follow-up, and it is very used by the dental surgeons [4, 5].

After the analysis of the case and of the possibility of endodontic treatment, it can discuss about what is the better therapeutic. In case of teeth with endodontic failures and periapical lesion, there is the conventional treatment, based mainly in the root re-treatment and the surgical treatment, most related to the less conservative approaches [3-6].

When it is determined the treatment method more efficient, Wong et al. (2015) affirm that the endodontists have different opinion about the number of necessary sessions to the finalization of a case. Some people prefer treatments in single session, while others, multiple sessions [1, 7-9]. Therefore, influenced by the fact that a well done diagnostic attached to an adequate endodontic treatment can favor a favorable prognostic, this study aims to relate a case,

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about these perspectives, in what an extensive lesion in the periapex, of low predictability, regresses after conventional endodontic treatment in single session.

II. CASE REPORT

Woman patient, L.B.F 38 years old, was leaved to dental attendance due to the necessity of endodontic re-treatment accomplishment in the 36 element that six months ago was in treatment with a friend, but unsuccessfully. During the anamnesis it was not confirmed none systemic commitment that could interfere in the dental treatment.

In the initial radiographic exam there was observed an extensive lesion radiolucent circumscribed at the periapical region of the 36 element. While in the clinical exam, the patient did not report spontaneous pain, only reported that sometimes when she has an increase of volume in the deep groove vestibular region of the tooth involved. It was not reported pain in the vertical or horizontal percussion, only a bother in the palpation and there was not confirmed mobility. After the analysis of the data from the clinical and radiographic exam, it was requested a computerized tomography (CT) to the patient. With the aid of the complementary exam (CT) it was observed the presence of filling material in the 1/3 apical region (Fig. 1).

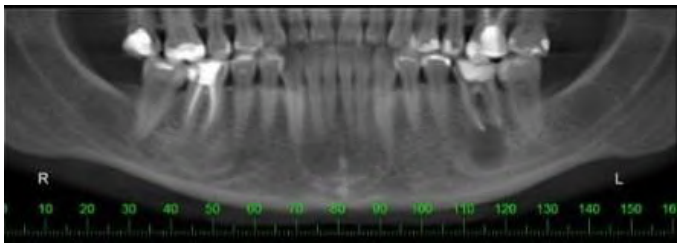

Fig. 1.Initial tomography showing extensive periradicular lesion associated with the element 36.

With previous agree from the treatment plan and when there is not impediment with the systemic health of the patient, it was done the endodontic non-surgical re-treatment of the dental unity in single session. After the antisepsis procedures, anesthesia and absolute isolations, it was done the regularization of the access with high rotation spherical drill KG #1014, followed by refinement of the access with ultrasonic tips coupled to the ultrasound.

The removal of the filling material and the formatting of the canal were done with Prodesing S e Logic (EASY, Brazil) rotary instrument. The prepare of the cervical third and medium was done softly, in brush strokes and with an amplitude limit of three millimeters in relation to the radiographic apex, this prepared was aided by the irrigation and aspiration with 2,5% sodium hypochlorite. The working length was obtained with a C-Pilot #10 manual instrument, 25mm longer (VDW, Munich, Germany) coupled with an ÁPEX foraminal location. To the final formatting of the canal it was used the LOGIC 35/05 lime (EASY, Brazil) with work longer in 0 related to the apical foramen, in each change of lime of the two systems used it was done foraminal patency with C-Pilot #10 manual limes, of 25mm longer (VDW, Munich, Germany). To the cone proof it was selected the M gutta-percha cone (Dentsply, Pensilvania, EUA), correspondent to the canal formatting instrument.

The working lenght was confirmed with the radiography of the cone proof. The remoting of the smear layer was done with the agitation of 17% EDTA (Fórmula & Ação, São Paulo, Brazil) with the EASY CLEAN tip, actioned in the low rotation pen, during three minutes, in three one minute applications, with EDTA renovation to each application. The final irrigation was done with 2,5% sodium hypochlorite. After the drying of the canal with absorbent paper tips, it was done the filling with AH Plus® endodontic sealer (Dentsply, Pensilvania, EUA), by the technique of vertical compaction.

After cleaning the pulp chamber, a temporary cement Coltosol (Vigodent, Rio de Janeiro, Brazil) plug was placed at the entrance of the canal and the tooth was restored with glass ionomer, and after one week an onlay was performed on porcelain (emax). Then, with the removal of the absolute isolation, the occlusion was checked, and the restoration finished. All treatment was performed in a single session. Immediate and one-year radiographic control after treatment (Fig. 2A and 2B) revealed signs of apical lesion repair through bone neoformation. And for this statement of repair, another CT scan was performed again, verifying the panoramic reconstruction (Fig. 3).

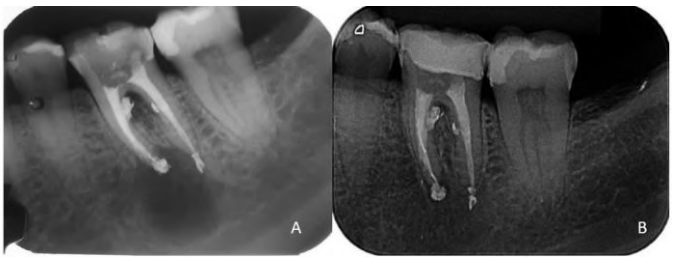

Fig. 2.A) Postoperative immediate radiographic control. B) One-year postoperative radiographic control.

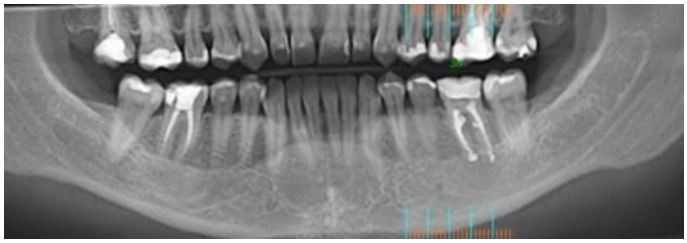

Fig. 3.Control tomography after one year of treatment demonstrating bone repair of extensive periradicular lesion associated with the element 36.

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III. DISCUSSION

The favorable prognostic of the reported case of chronical apical abscess suggests that the endodontist may has attention to the process of decision making to the therapeutic success in cases of endodontic failure with periapical lesion, because generally these teeth have a bad, questionable, or hopeless prognostic. The predictability of the treatment of these cases, to Fahmy et al. (2016), is based in periodontal, endodontic and restore parameters [1, 4, 10].

The analysis of the teeth periodontal consists in the evaluation of the quantity of insertion loss, in the depth of the probing bag of furcation wrapping. Besides, it should analyses the presence of pulp infection/necrosis and caries. However, even the cases considered hopeless, it can be treated with success, because the retention of a tooth with a bad prognostic is possible if the treatment follows a structured approach based in the oral hygiene of the patient, capacity of restauration of the tooth, and decision of the patient, after clearly clarifications of the case [2, 10].

Besides the analysis by clinical exam, it is known the importance of using methods of safety and trustworthy image diagnostic to favor the clinical decision making. With this, it was used in this case for the postoperative diagnostic and follow-up, the radiographic and tomographic methods. Related to these methods, are reported negative points in the radiographies when affirm that the quantity of details provided in the mesio-distal plane is acceptable, however the superposition of anatomic structures difficult the observation of details in the buccolingual plane [11]. In this form, the intraoral radiographies have limitations in the diagnostic and evaluation of the periapical bony repair after the conventional or surgical endodontic treatment [2, 7, 11].

However, it is highlighted that the radiographic method is one of the most viable to the dentist surgeon and to the patients, is very used in the dental clinic [4]. But, if it is necessary and indispensable, the TCCB may be requested to guarantee the desired success, because it provides tridimensional images of maxillofacial structures, what is used to the evaluation of periapical bony lesions and their repairs after the conventional or surgical endodontic treatment, because it has a higher accuracy in the detection of these lesions related to the bidimensional methods [6, 7, 11].

With the establishment of the diagnostic, the dentist should accomplish the less invasive treatment that may solve the problem, always based in scientific evidences. In this perspective, when still is possible improving the quality of the chemical mechanical prepare and fill of the previous filling material, the conventional approach is the main choose, because it is more conservative in the process of periapical tissue repair [1, 2, 7]. The author emphasizes that the endodontic re-treatment is one of the more common and satisfactory forms of non-surgical treatment, because it consists in the remoting of filling material, effective debridement and irrigator action in the conducts. Various techniques can be used to remove the gutta-percha, between them there are the use of solvents, heat, mechanical instruments and the combination of these methods [2].

However, though the re-treatment of root canals can give satisfactory results, the lesions cannot heal in some cases, making surgical treatment options required [4]. Thus, the author affirms with Jorge et al. (2015) that the endodontic surgery can be an option to cases where the conventional treatment was not successful, or even when is noted that, initially, that the surgical method is the better choice according to the case characteristics [6, 11, 12].

Basing on these positions, although it was confirmed the presence of an extensive periapical lesion in the reported case, it was opted to the accomplishment of an endodontic re-treatment due to the conservative of the method and the clinical possibility of the procedure. Besides, it was decided to preserve the case to the periodical verification of the tissue repair. As documented, the clinical evolution is satisfactory after one year of the intervention, where is not necessary the surgery accomplishment [13].

The reported case was treated in single session as a fast form of prevent the evolution of the lesion and after the loss of the dental element. In this case, there is many discussions about the number of necessary sessions to the finishing of an endodontic treatment: single or multiple session. The main reasons to the treatment of various visits is the need to a longer time to achieve the treatment, well accepted idea as a safe and common therapy. However, the author affirms that the argument began to be questioned when the use of contemporary endodontic techniques and equipment became common, as enlargement devices, electronic apical locators, nickel titanium files actioned by motor, and others artifices that maintained the treatment success rate and reduces the work time [7, 12].

In one of the studies done by Wong et al. [7] it was evaluated the success rate of 294 teeth endodontically treated in single and multiple session. With the results, it was confirmed that the success rates to the treatment of single visit ($n = 104$) and treatment of multiple visit ($n = 90$) were 88,9 and 87,4%, respectively. Besides, it was analyzed that the prevalence of postoperative pain after one week of single and multiple visit was 21 e 12%, while the prevalence of postoperative pain after, minimally, 18 months one week of single and multiple visit was 0,9 e 1,0%, respectively. Then, this study did not present significant statistical difference between the evaluated questions, concluding that both techniques are satisfactory, but the single session besides guarantees predictable success in the tissue heal, also reduces the necessary time to the treatment satisfying the patient preference [14].

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IV. CONCLUSION

The reported case of non-surgical endodontic re-treatment in single session was successful, because it eliminated the infectious processes of the root canals systems that permitted the periapical bony neoformation and unleashed the symptomatology absence. These results occurred due to the cleaning and disinfection of the canal systems, adequate electronic instrumentation, efficient filling and coronary sealing. Besides, it was confirmed that a precise diagnostic, attached to an indicated endodontic treatment, can avoid an unnecessary surgical intervention, enabling a favorable prognostic long-therm.

REFERENCES

[1] Siqueira Junior JF, Rôças IDN, Marceliano-Alves MF, Pérez AR, Ricucci D. Unprepared root canal surface areas: causes, clinical implications, and therapeutic strategies. Braz Oral Res. 2018 Oct 18;32(suppl 1):e65.

[2] Rotstein, I. Interaction between endodontics and periodontics. Periodontology 2000, [s.l.], v. 74, n. 1, p.11-39, 21 abr. 2017.

[3] Olcay K; Ataoglu H; Belli S. Evaluation of related factors in the failure of endodontically treated teeth: a cross-sectional Study. Journal Of Endodontics, [s.l.], v. 44, n. 1, p.38-45, jan. 2018.

[4] Rodríguez G, Patel S, Durán-Sindreu F, Roig M, Abella F. Influence of cone-beam computed tomography on endodontic retreatment strategies among general dental practitioners and endodontists. J Endod. 2017 Sep;43(9):1433-1437.

[5] Jorge ÉG, Tanomaru-Filho M, Guerreiro-Tanomaru JM, Reis JM, Spin-Neto R, Gonçalves M. Periapical repair following endodontic surgery: two- and three-dimensional imaging evaluation methods. Braz Dent J. 2015 Jan-Feb;26(1):69-74.

[6] Siqueira JF Jr, Alves FR, Versiani MA, Rôças IN, Almeida BM, Neves MA, Sousa-Neto MD. Correlative bacteriologic and micro-computed tomographic analysis of mandibular molar mesial canals prepared by self-adjusting file, reciproc, and twisted file systems. J Endod. 2013 Aug;39(8):1044-50.

[7] Wong AW, Tsang CS, Zhang S, Li KY, Zhang C, Chu CH. Treatment outcomes of single-visit versus multiple-visit non-surgical endodontic therapy: a randomised clinical trial. BMC Oral Health. 2015 Dec 19;15:162.

[8] Siqueira JF Jr, Guimarães-Pinto T, Rôças IN. Effects of chemomechanical preparation with 2.5% sodium hypochlorite and intracanal medication with calcium hydroxide on cultivable bacteria in infected root canals. J Endod. 2007 Jul;33(7):800-5.

[9] Siqueira JF Jr, Rôças IN, Lopes HP, Magalhães FA, de Uzeda M. Elimination of Candida albicans infection of the radicular dentin by intracanal medications. J Endod. 2003 Aug;29(8):501-4.

[10] Fahmy MD, Luepke PG, Ibrahim MS, Guentsch A. Treatment of a periodontic-endodontic lesion in a patient with aggressive periodontitis. Case Rep Dent. 2016;2016:7080781.

[11] Segura-Egea JJ, Martín-González J, Jiménez-Sánchez MDC, Crespo-Gallardo I, Saúco-Márquez JJ, Velasco-Ortega E. Worldwide pattern of antibiotic prescription in endodontic infections. Int Dent J. 2017 Aug;67(4):197-205.

[12] Alomaym MAA, Aldohan MFM, Alharbi MJ, Alharbi NA. Single versus multiple sitting endodontic treatment: incidence of postoperative pain - a randomized controlled trial. J Int Soc Prev Community Dent. 2019 Mar-Apr;9(2):172-177.

[13] Babić B, Barun J, Jukić Krmek S, Kotarac Knežević A, Salarić I, Ivanišević Malčić A. Clinical and radiographic sssessment of cases referred to endodontic surgery. Acta Stomatol Croat. 2019 Jun;53(2):132-140.

[14] Alsulaimani RS. Single-visit endodontic treatment of mature teeth with chronic apical abscesses using mineral trioxide aggregate cement: a randomized clinical trial. BMC Oral Health. 2016 Aug 23;16(1):78.