

Cleaning capacity of hybrid instrumentation technique using reamer with alternating cutting edges system files: Histological analysis

EMILIO CARLOS SPONCHIADO JÚNIOR, TIAGO SILVA DA FONSECA¹, MATHEUS FRANCO DA FROTA¹, FREDSON MARCIO ACRIS DE CARVALHO², ANDRÉ AUGUSTO FRANCO MARQUES², LUCAS DA FONSECA ROBERTI GARCIA³

Abstract

Aim: The aim of the following study is to evaluate the cleaning capacity of a hybrid instrumentation technique using Reamer with Alternating Cutting Edges (RaCe) system files in the apical third of mesial roots of mandibular molars. **Materials and Methods:** Twenty teeth were selected and separated into two groups ($n = 20$) according to instrumentation technique as follows: BioRaCe - chemomechanical preparation with K-type files #10 and #15; and files BioRaCe BR0, BR1, BR2, BR3, and BR4; HybTec - hybrid instrumentation technique with K-type files #10 and #15 in the working length, #20 at 2 mm, #25 at 3 mm, cervical preparation with Largo burs #1 and #2; apical preparation with K-type files #15, #20, and #25 and RaCe files #25.04 and #30.04. The root canals were irrigated with 1 ml of 2.5% sodium hypochlorite at each change of instrument. The specimens were histologically processed and photographed under light optical microscope. The images were inserted onto an integration grid to count the amount of debris present in the root canal. **Results:** BioRaCe presented the highest percentage of debris in the apical third, however, with no statistically significant difference for HybTec ($P > 0.05$). **Conclusions:** The hybrid technique presented similar cleaning capacity as the technique recommended by the manufacturer.

Keywords: Cleaning capacity, endodontics, root canal treatment, rotary endodontics

Introduction

Chemomechanical preparation is a fundamental phase for the success of endodontic therapy, for it removes the remaining pulp tissue and microorganisms.^[1-3] The diameter of instruments should be gradually increased, under constant irrigation and aspiration, to obtain a conical-shaped root canal, with its smallest diameter in the apical region and larger diameter in the cervical region, the latter being the most commonly contaminated site, due to its proximity to the pulp chamber and oral cavity.^[4-6]

Departments of Endodontics, School of Dentistry, Federal University of Amazonas, ²State University of Amazonas, Manaus, AM, ¹Department of Restorative Dentistry, Araraquara School of Dentistry, University of São Paulo State, Araraquara, ³Department of Dental Materials and Prosthodontics, Ribeirão Preto School of Dentistry, University of São Paulo, Ribeirão Preto, SP, Brazil

Correspondence: Dr. Lucas da Fonseca Roberti Garcia, Rua Siró Kaku, No. 72, Apto. 73, Bairro Jardim Botânico, CEP: 14021 - 614, Ribeirão Preto, São Paulo, Brazil. E-mail: drlucas.garcia@gmail.com

Several factors influence the cleaning capacity of instrumentation techniques during chemomechanical preparation, such as the file type, technique sequence, irrigation solutions, and particularly the internal anatomical variations of the root canals.^[7-10] Modifications in the internal anatomy of the tooth contribute to the success or failure of endodontic treatment because debris may remain attached to the dentine walls, isthmus areas, and ramifications of severely curved or flattened root canals.^[3,7,11-13]

Two separate and distinct roots are found in the mandibular first molars, a mesial and a distal root, which may eventually present a third root as a result of the division of the mesial root or, less frequently, the distal root.^[14] Performing endodontic treatment in these teeth is moderately complex, particularly during chemomechanical preparation.^[11,12,14]

Considering the limitations imposed by the anatomical variations, the cleaning capacity of instruments and the preparation techniques have been studied at present. For years, stainless steel hand instruments were the only option available for endodontic treatment;^[15,16] however, due to the rigid nature of metal instruments, adequate preparation of curved root canals was limited.^[15,16] The nickel-titanium instruments shape the root canals without deforming the original root canal shape and they have become the most commonly used instruments in endodontics due to their elasticity. Therefore, it was possible to change several geometric characteristics of instruments such as the cross-sectional design, taper, shape of the cutting flutes, length of the helical flutes, among others.^[15-18]

Access this article online	
Quick Response Code: 	Website: www.contempclindent.org
	DOI: 10.4103/0976-237X.132330

The FKG-Reamer with Alternating Cutting Edges (RaCe) system was developed by FKG Dentaire and designed for mechanical devices with continuous right-hand rotation.^[19] The cutting edges are disposed parallel to the long axis of the instrument, which, combined with the alternating helical angles, reduce the speed rate preventing the effect of threading and locking of the file inside the canal, thus reducing torque variation and minimizing plastic deformation, as well as the risk of instrument fracture due to torsion.^[19-21] After the machining process, the instruments go through electrochemical treatment to reduce the scratches during the fabrication process, improving the mechanical behavior of the files.^[19] The instruments may have straight cross-sectional triangular or quadrangular design, without a radial guide, with three or four fillet-shaped lateral cutting edges and three or four helical channels.^[19-21]

The instruments of the RaCe system are commercially available in two sets called Easy RaCe and BioRaCe, and they have the same metallurgical characteristics.^[19] The basic BioRaCe set is used in root canals with common diameters and curvature, and it is composed of the following instruments: BR0 (#25.08), BR1 (#15.05), BR2 (#25.04), BR3 (#25.06), BR4 (#35.04), and BR5 (#40.04). The special BioRaCe set is used to complement instrumentation and it is composed of the following instruments: BR4C (#35.02) and BR5C (#40.02) for atretic canals or severely curved canals, and BR6 (#50.04) and BR7 (#60.02) for large canals.^[20,21]

Therefore, hybrid techniques using RaCe system files need to be evaluated whether they present adequate cleaning capacity without diverting the original trajectory of the canal since these techniques use more rigid instruments, and cervical preparation recommended by the manufacturer is not performed, reducing the cost of root canal treatment and making it more accessible without losing quality and excellence.^[13]

Thus, the aim of this study was to evaluate histologically the cleaning capacity of a hybrid instrumentation technique using RaCe system files in the apical third of mesial canal roots of mandibular molars. The hypothesis tested was that there was no difference in the cleaning capacity between the two types of instrumentation techniques tested.

Materials and Methods

Twenty human mandibular molars provided by the Human Tooth Bank of the School of Dentistry of the State University of Amazonas, with the consent of the Ethics Committee of the institution, were used in this study. The teeth that presented no previous endodontic treatment, similar length, and curvature degree between 20° and 40° were selected.

The mesial roots of the teeth were sectioned with the aid of diamond tips 2200 (KG Sorensen, Barueri, SP, Brazil) close

to the cement-enamel junction, standardizing the length to 14 mm.

The samples were embedded in an acrylic resin base for chemomechanical preparation. To verify if the root canals were unobstructed, K-type file #10 (Dentsply-Maillefer, Ballaigues, Switzerland) passed through the apical foramen, followed by withdrawal of 0.5 mm to establish the working length. The samples were randomly separated into two groups ($n = 20$), as follows:

- **BioRaCe:** Chemomechanical preparation with BioRaCe instruments (FKG Dentaire, La Chaux-de-Fonds, France) in accordance with the manufacturer's recommendations. The initial exploration of root canals was performed with K-type files (Dentsply-Maillefer) #10 and #15 in the working length. Next, the instrument BR0 (25.08) was used at 5 mm from the apex and instruments BR1 (15.05), BR2 (25.04), BR3 (25.06), and BR4 (35.04) in the working length
- **HybTec:** Hybrid instrumentation technique with initial exploration of the root canals with K-type files (Dentsply-Maillefer, Ballaigues, Switzerland) #10 and #15 up to the working length, #20 at 2 mm from the working length, and #25 file 3 mm below the working length. Cervical preparation was performed using Largo reamers 1 and 2 at 6 mm from the working length. Next, debridement in the apical third was performed with stainless steel K-type files #15, #20 and #25 and the root canal was finished with RaCe instruments #25.04 and #30.04 (FKG Dentaire), both respecting the working length.

The rotary instruments were coupled to an X-Smart electric motor (Dentsply-Maillefer) with torque of 1 N/cm² and speed of 300 rpm. At each change of instruments, the root canals were irrigated with 1 ml of 2.5% sodium hypochlorite. All experimental procedures were performed by one operator.

After chemomechanical preparation, the roots were submitted to histological processing. The specimens were dehydrated in increasing grades of alcohol (70%, 90%, 95%, and 100%), immersed into xylol and embedded in paraffin. The specimens were sectioned in a microtome into semi-serial cuts 5-mm thick in the longitudinal direction, with 10 cuts being discarded and 5 stained with hematoxylin and eosin.

Histological analysis was performed blindly by a single examiner under optical light microscope (AxioStar Plus, Carl Zeiss, Oberkachen, Germany) at ×40 magnification [Figure 1].

Each image obtained was placed on a squared integration grid with 18 frames on each side, totaling 324 squares, on which area of each root canal and the area occupied by debris were calculated. After counting the squares that covered the total area of the cross-section of the root canal, the total number of squares that covered the areas with debris in the same image

was counted to obtain a percentage for each image. For this calculation, the number of squares with debris was divided by the total number of cross-sectional squares. The mean of debris of the apical third of each tooth resulted from the reading of 12 histological cuts. The normal distribution of data was tested by the Kolmogorov-Smirnov test for homogeneity of variance. One-way ANOVA was used, and the Kruskal-Wallis *post-hoc* test was performed for multiple comparisons ($P < 0.05$).

Results

The mean values in percentage of the presence of debris in the root canals are presented in Table 1.

The results demonstrated that there was no statistically significant difference ($P > 0.05$) between the studied groups. Figures 2 and 3 represent the histological images of groups BioRace and HybTec, respectively.

Discussion

The present study assessed the cleaning capacity of a hybrid instrumentation technique used in the apical third of mesial roots of mandibular molars in comparison with the BioRace system. Based on the results obtained, the hypothesis tested was accepted. Furthermore, the aim of the study was to also analyze if the use of a hybrid technique with fixed taper

rotary instruments offers an advantage or disadvantage in comparison with the rotary sequence recommended by the manufacturer of the BioRace system.

Mesial roots of mandibular molars were chosen because they are more common in Endodontics offices, in addition to having an isthmus between the two main root canals,^[12,17] which makes endodontic treatment difficult.^[11,14] To standardize the results, the specimens were embedded in an acrylic resin base to simulate the oral cavity during routine endodontic treatment.^[6,11,22]

Furthermore, the apical region was selected for analysis because it is a “critical area” for the pathogens, host and the professional.^[7] Due to the close contact with the periradicular tissues, which are a source of nutrients; the pathogens cause damage to the apical region.^[2,4,7] It is dangerous to the host, since the defense mechanisms are concentrated in this area, causing an inflammatory process, which in turn, tries to delimit the infectious process and confine it to the root canal, preventing the spread of infection to the alveolar bone.^[2,4,7,16,21]

The success of endodontic treatment depends on the ability of the professional to eradicate infection in the apical third and promote adequate sealing of the root canal systems against microorganisms and oral and tissue fluids.^[2,16,21]

The periapical region may suffer the consequences of pathological changes in the pulp, either by the action of the products of decomposition or by direct action of microorganisms and their toxins, as well as iatrogenic intervention during endodontic treatment causing different

Table 1: Mean values (%) and standard deviation of debris in the apical third in each group

Groups	
BioRace	HybTec
20.63±4.5	16.61±4.1

There was no statistically significant difference for any of the studied groups ($P > 0.05$)

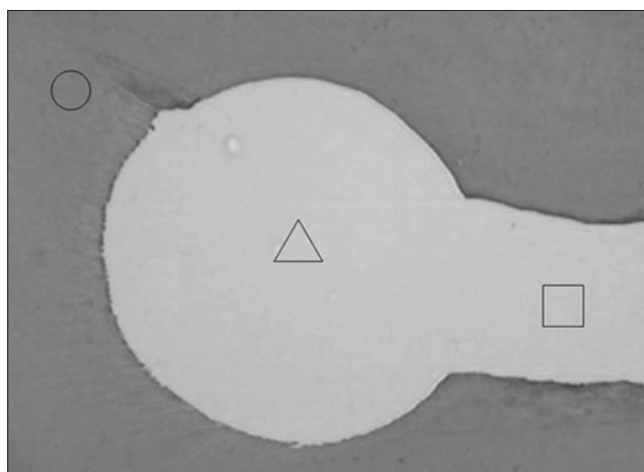


Figure 1: Photomicrographs of the root canals. Area of analysis - Canal lumen (triangle), dentine (circle), and isthmus region (square) (H and E, ×40)

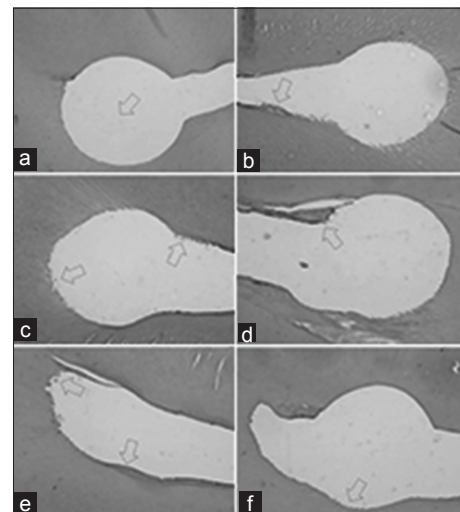


Figure 2: BioRace - (a) Canal lumen (arrow) free of debris. (b) Debris adhered to the isthmus region (arrow). (c) Canal walls and isthmus free of debris (arrows). (d) Remaining pulp tissue near the isthmus region (arrow). (e) Debris adhered to the wall and inside the canal lumen (arrows). (f) Area untouched during instrumentation (arrow) (H and E, ×40)

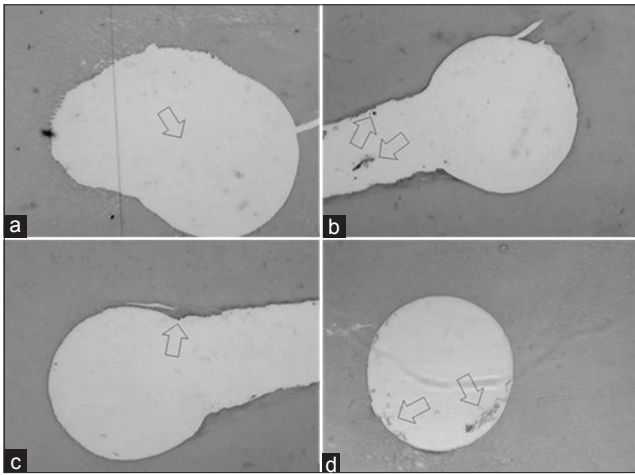


Figure 3: HybTec - (a) Canal lumen (arrow) free of debris. (b) Small amount of debris in the isthmus region (arrow). (c) Debris adhered to the canal wall and isthmus region (arrows). (d) Presence of debris inside the root canal (arrows) (H and E, $\times 40$)

periapical reactions.^[1,4,23] This region is the central nervous, vascular and lymphatic system of the entire periodontium and when traumatized it may produce an undesirable response in the entire periodontal structure leading to a painful condition.^[1,4,23] It is considered as one of the areas of the organism with the highest metabolic activity and the periapical region in contemporary endodontics plays a key role in the biological aspect of endodontic treatment.^[4] Thus, further research is needed in order to develop techniques that respect the anatomy and peculiarities of this region.^[10,24]

It is a consensus among endodontists that the greatest biological objective of endodontic therapy is to treat apical periodontitis by disinfecting and sealing the root canal system.^[10] However, there is disagreement with regard to the best way to attain this goal. Shaping and cleaning of enlarged root canals facilitate the action and penetration of irrigation solutions, removal of debris and infected dentine, thus promoting greater cleaning capacity.^[3] Microorganisms present in the pulp chamber and in the coronal portion of the root canal can be easily removed by irrigation solutions at the beginning of endodontic therapy; however, pathogens remaining in hidden areas of the root canal may still lead to apical periodontitis.^[12,25] Only after root canal preparation can these bacteria be eradicated.^[12,25]

An important objective of mechanical instrumentation of the root canal systems is the complete incorporation of the original canals in the shape of the preparation, which means that all surfaces of the root canal are touched by the instruments; however, this goal is not possible using the current techniques and devices available,^[25] as it was found in the histological analysis of the present study. Another mechanical objective is to maintain the greatest thickness

possible of the root dentine in order not to weaken the root structure and prevent vertical fractures. Thus, it is imperative to find ways to promote effective cleaning using the smallest apical diameter possible.^[7,11,26]

The present study showed that instrument #30.04 used to finalize the hybrid technique was as effective as instrument #35.04 used to finalize an exclusively rotary sequence. Therefore, preparation was more conservative as it used less rotary instruments, promoting less fatigue of files, and consequently reducing the risk of fracture during the procedure. Khademi *et al.*^[2] demonstrated that instrument #30 allows irrigation solutions to reach the apical third and Arvaniti and Khabbaz^[25] showed that instrument #30.04 suffices to promote effective cleaning.

Large areas of the canal walls, particularly in the apical third, but also in flattened canals and isthmus areas, cannot be cleaned mechanically using the tools available at present, which means that microorganisms can survive in these untouched areas, and in combination or not with remaining pulp tissues, it may lead to the prolongation or onset of an inflammatory process.^[2,7,14] There are residual bacteria and other microorganisms both in these difficult-to-access areas and in the dentinal tubules.^[11] The 2.5% sodium hypochlorite was used as the irrigation solution in the present study due to its antimicrobial properties and high solvency for organic material.^[11,12,14]

Therefore, the combination of different preparation techniques with Ni-Ti systems and hand files is suggested in order to take advantage of their qualities and prevent the problems caused by each of them.^[5,11] Different combinations are possible in hybrid techniques. The most commonly used techniques involve initial exploration of the root canals using hand instruments, followed by cervical preparation and final apical preparation with Ni-Ti rotary instruments.^[5,11] It must be understood that the sequences can be changed according to each case and the most relevant factors are the anatomical variations.^[27] The root canals can be oval-shaped in the apical foramen region, but a rotary file will create a round-shaped canal preparation due to its kinematics.^[5,11] Previous approximation using hand files provides greater contact with the root canal walls, improving the cleaning capacity and consequently, leading to good prognosis even in teeth with periradicular inflammation.^[13,28]

Studies using analysis of histological sections show important areas which were not prepared with conventional rotary instruments.^[5,11,29] The aim of hybrid techniques is to increase the apical diameter through a procedure that additionally minimizes the concentration of forces at the tip of the rotary instruments, reducing the risk of file fracture.^[11] The technique allows the use of several instruments. The Largo burs provide straight-line access to the apical region, reducing contact of the rotary instruments with cervical and middle thirds, as

we could see in the present study.^[27,28] Apical preparation can be performed with different tapered instruments, such as the Universal ProTaper system (Dentsply-Maillefer) or fixed tapered instruments such as the K3 (Sybron Endo, West Collins Orange, CA, USA), Profile (Dentsply-Maillefer), Hero (Micromega, Besançon, France), and RaCe (FKG Dentaire) systems, being the latter used in the present study.^[1,11,27,28]

Current cleaning and shaping concepts promote the removal of organic and inorganic material, infected or not, from inside the root canal system and at the same time, produce a tapered, conical funnel-shaped canal preparation in the apical direction with the objective of optimizing cleaning and obturation.^[19,25,28] A preparation in the crown-apex direction consists in previously debriding the cervical and middle thirds, then working in the apical third, reducing the extrusion of septic material in the periapical region, which is the main etiological factor for exacerbation of asymptomatic periapical inflammatory processes after completion of endodontic treatment or between sessions.^[10,12,14,18]

The concentration of bacteria in the root canal system is proportionally larger when closer to the pulp chamber and reduces in the apical direction due to caries being the main route for microbial access.^[12] The diameter of the main canal, as well as the thickness and density of the dentinal tubules, decrease in the crown-apex direction. These characteristics justify the greater enlargement in the cervical and middle regions of the root canal.^[12] In addition, conical preparation promotes a more apical penetration of the irrigation solution, facilitating the removal of debris during irrigation and aspiration.^[14,18]

The results in the present study demonstrated that the use of a hybrid technique, using less rotary instruments, reduces treatment costs and promotes less fatigue to files, reduces the risk of fracture and promotes a more conservative preparation when compared with the one recommended by manufacturer. However, further studies are needed in order to evaluate if the technique causes deviations in the original trajectory of the root canal and its clinical effectiveness.

Acknowledgments

The authors would like to thank to FAPEAM, through the Institutional Program of Scholarships for Scientific Initiation of the Federal University of Amazonas, for financial support.

References

1. Tan BT, Messer HH. The quality of apical canal preparation using hand and rotary instruments with specific criteria for enlargement based on initial apical file size. *J Endod* 2002;28:658-64.
2. Khademi A, Yazdizadeh M, Feizianfard M. Determination of the minimum instrumentation size for penetration of irrigants to the apical third of root canal systems. *J Endod* 2006;32:417-20.
3. Mickel AK, Chogle S, Liddle J, Huffaker K, Jones JJ. The role of apical size determination and enlargement in the reduction of intracanal bacteria. *J Endod* 2007;33:21-3.
4. Weller PJ, Svec TA, Powers JM, Ludington JR Jr, Suchina JA. Remaining dentin thickness in the apical 4 mm following four cleaning and shaping techniques. *J Endod* 2005;31:464-7.
5. Bonaccorso A, Cantatore G, Condorelli GG, Schäfer E, Tripi TR. Shaping ability of four nickel-titanium rotary instruments in simulated S-shaped canals. *J Endod* 2009;35:883-6.
6. Markvart M, Darvann TA, Larsen P, Dalstra M, Kreiborg S, Bjørndal L. Micro-CT analyses of apical enlargement and molar root canal complexity. *Int Endod J* 2012;45:273-81.
7. Baugh D, Wallace J. The role of apical instrumentation in root canal treatment: A review of the literature. *J Endod* 2005;31:333-40.
8. Schäfer E, Vlassis M. Comparative investigation of two rotary nickel-titanium instruments: ProTaper versus RaCe. Part 1. Shaping ability in simulated curved canals. *Int Endod J* 2004;37:229-38.
9. Schäfer E, Erler M, Dammaschke T. Comparative study on the shaping ability and cleaning efficiency of rotary Mtwo instruments. Part 1. Shaping ability in simulated curved canals. *Int Endod J* 2006;39:196-202.
10. Fornari VJ, Silva-Sousa YT, Vanni JR, Pécora JD, Versiani MA, Sousa-Neto MD. Histological evaluation of the effectiveness of increased apical enlargement for cleaning the apical third of curved canals. *Int Endod J* 2010;43:988-94.
11. Gonçalves LC, Junior EC, da Frota MF, Marques AA, Garcia Lda F. Morphometrical analysis of cleaning capacity of a hybrid instrumentation in mesial flattened root canals. *Aust Endod J* 2011;37:99-104.
12. Alves FR, Almeida BM, Neves MA, Moreno JO, Rôças IN, Siqueira JF Jr. Disinfecting oval-shaped root canals: Effectiveness of different supplementary approaches. *J Endod* 2011;37:496-501.
13. Pinheiro SL, Araujo G, Bincelli I, Cunha R, Bueno C. Evaluation of cleaning capacity and instrumentation time of manual, hybrid and rotary instrumentation techniques in primary molars. *Int Endod J* 2012;45:379-85.
14. Barbizam JV, Fariniuk LF, Marchesan MA, Pecora JD, Sousa-Neto MD. Effectiveness of manual and rotary instrumentation techniques for cleaning flattened root canals. *J Endod* 2002;28:365-6.
15. Troian CH, Só MV, Figueiredo JA, Oliveira EP. Deformation and fracture of RaCe and K3 endodontic instruments according to the number of uses. *Int Endod J* 2006;39:616-25.
16. Javaheri HH, Javaheri GH. A comparison of three Ni-Ti rotary instruments in apical transportation. *J Endod* 2007;33:284-6.
17. Yared G. Canal preparation using only one Ni-Ti rotary instrument: Preliminary observations. *Int Endod J* 2008;41:339-44.
18. Rödiger T, Hausdörfer T, Konietzschke F, Dullin C, Hahn W, Hülsmann M. Efficacy of D-RaCe and ProTaper Universal Retreatment NiTi instruments and hand files in removing gutta-percha from curved root canals-A micro-computed tomography study. *Int Endod J* 2012;45:580-9.
19. García M, Duran-Sindreu F, Mercadé M, Bueno R, Roig M. A comparison of apical transportation between ProFile and RaCe rotary instruments. *J Endod* 2012;38:990-2.
20. Rangel S, Cremonese R, Bryant S, Dummer P. Shaping ability of RaCe rotary nickel-titanium instruments in simulated root canals. *J Endod* 2005;31:460-3.
21. Pasternak-Júnior B, Sousa-Neto MD, Silva RG. Canal transportation and centring ability of RaCe rotary instruments. *Int Endod J* 2009;42:499-506.
22. Bürklein S, Hiller C, Huda M, Schäfer E. Shaping ability and cleaning effectiveness of Mtwo versus coated and uncoated EasyShape instruments in severely curved root canals of extracted teeth. *Int Endod J* 2011;44:447-57.
23. Schäfer E, Vlassis M. Comparative investigation of two rotary nickel-titanium instruments: ProTaper versus RaCe. Part 2. Cleaning effectiveness and shaping ability in severely curved root canals of extracted teeth. *Int Endod J* 2004;37:239-48.
24. Leonardi LE, Atlas DM, Raiden G. Apical extrusion of debris

- by manual and mechanical instrumentation. *Braz Dent J* 2007;18:16-9.
25. Arvaniti IS, Khabbaz MG. Influence of root canal taper on its cleanliness: A scanning electron microscopic study. *J Endod* 2011;37:871-4.
26. Al-Sudani D, Al-Shahrani S. A comparison of the canal centering ability of ProFile, K3, and RaCe Nickel Titanium rotary systems. *J Endod* 2006;32:1198-201.
27. Vaudt J, Bitter K, Neumann K, Kielbassa AM. *Ex vivo* study on root canal instrumentation of two rotary nickel-titanium systems in comparison to stainless steel hand instruments. *Int Endod J* 2009;42:22-33.
28. Ounsi HF, Franciosi G, Paragliola R, Al-Hezaimi K, Salameh Z, Tay FR, *et al.* Comparison of two techniques for assessing the shaping efficacy of repeatedly used nickel-titanium rotary instruments. *J Endod* 2011;37:847-50.
29. Limongi O, de Albuquerque DS, Baratto Filho F, Vanni JR, de Oliveira EP, Barletta FB. *In vitro* comparative study of manual and mechanical rotary instrumentation of root canals using computed tomography. *Braz Dent J* 2007;18:289-93.

How to cite this article: Junior ES, da Fonseca TS, da Frota MF, de Carvalho FA, Marques AF, Garcia LR. Cleaning capacity of hybrid instrumentation technique using reamer with alternating cutting edges system files: Histological analysis. *Contemp Clin Dent* 2014;5:203-8.

Source of Support: FAPEAM, through the Institutional Program of Scholarships for Scientific Initiation of the Federal University of Amazonas.

Conflict of Interest: None declared.

Staying in touch with the journal

1) Table of Contents (TOC) email alert

Receive an email alert containing the TOC when a new complete issue of the journal is made available online. To register for TOC alerts go to www.contempclindent.org/signup.asp.

2) RSS feeds

Really Simple Syndication (RSS) helps you to get alerts on new publication right on your desktop without going to the journal's website. You need a software (e.g. RSSReader, Feed Demon, FeedReader, My Yahoo!, NewsGator and NewzCrawler) to get advantage of this tool. RSS feeds can also be read through FireFox or Microsoft Outlook 2007. Once any of these small (and mostly free) software is installed, add www.contempclindent.org/rssfeed.asp as one of the feeds.