EXPERIMENTAL RESEARCH ON THE USE OF ULTRASOUND TO FIND HIDDEN CANALS AND CALCIFIED AND ACHIEVE ACCESS TO THE PULP CHAMBER

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ABSTRACT: To find the hidden channel and calcified, and to achieve easier access to the root canals is provided a first endodontic instrument and the specific activity of the central channel to allow the entry of a cooling fluid in the work area and to create the phenomenon of ultrasonic cavitation; Ultrasonically activated endodontic instruments proposed to remove the obstacles intracanalicular, and techniques advantages the following: a minimum of damage to the tooth and surrounding tissues, decreases the time required removal 4 ... 8 times better as it allows a restoration risk of weakening, perforation or the root fracture and no noise. Should be chosen very carefully during ultrasonic activation pin or silver cone because of risk and excess heat damage periapical and apical tissues and risk of rupture cone tip silver. Extracting fragments of broken endodontic instruments from root canals is sometimes an extremely difficult even for the most experienced clinician, since it is still possible of endodontic treatment, or lead to surgery.

KEY WORDS: canals, calcified, cavitation, instrument.

1. INTRODUCTION

When searching for hidden and calcified canals should be kept in mind that in most cases secondary dentin or opaque whitish while the pulp chamber is closed and gray. Experimentally it was found that ultrasound has increased efficiency when they break and remove calcifications covering the opening of these channels. To remove the disadvantages that have different rotary variants currently used in experiments using an endodontic instrument as shown in figure 1. /1/,/2/,/9/.

The instrument is provided with a central channel that allows the entry of liquid (hydrogen peroxide solution of Ca (OH) 2, any solvent) in place of action in order to create cavitation contribute significantly to the removal of hard coatings. The active part ends with a blade tip with a certain radius of connection that allows work areas to remove deeper channel secondary dentin and existing calcifications.

Experimental results on finding hidden canals and calcified

Experiments were made using ultrasonic endodontic device, model AP-DEU-02 CC ultrasonic system and calculated to work in the resonance, an endodontic instrument stainless steel ultrasonic activated form the frequency ultrasound in the range 40…60 kHz (the figure is calculated tool to work in the resonance at 25.25 kHz) ultrasonic intensity 143.5 W/cm2, where longitudinal wavelength 0.2 m.

The tool is made from heat-treated stainless steel having good stress resistance as well as a slight flexibility to avoid cracking in the machined. The “gooseneck” endodontic instrument provides a shock absorption that occur when ultrasonic activation to an active-enamel interface, thus greatly increasing the durability of the instrument. It has the advantages that it provides a less aggressive cutting area and has a much higher resistance than that currently used instruments and the diamond tip having a cutting aggressive and tends to fracture.
Finding channels and making access to the root canals using this technique is shown in figure 2. /1/,/7/,/8/.

Experiments have shown that the ultrasonic method has the following advantages over traditional methods: increased efficiency because time is halved, introduced thermal stresses are lower, quality is much better machined surfaces, there is shock and break their requests and missing tool noise and therefore a low stress for the patient.

Experimental research and original contributions on the use of ultrasound to remove obstacles intracanalary

Problem removing intracanal obstructions is sometimes complicated for the best and skilled clinicians. I developed numerous techniques and appropriate tools for removing these obstacles. Depending on the nature of the obstacles (debris broken instruments, silver cones, pivots and pins scrap broken, hard paste, condensed gutta etc.) Their position in the tooth tissues and the need for disposal. Theoretical and experimental research undertaken in the thesis were made according to the nature of obstacles and their position in the dental tissue.

Intraradyculares abutment teeth removal and reprocessing through nonsurgical endodontic treatment is a particular problem for clinicians and not always possible due to problems caused by debris removal pivots or pins.

Experiments were conducted primarily on removing pivots intraradycular and remnants of broken pins. In experiments have enabled ultrasonic endodontic instruments used in figure 3. /1/,/2/,/6/.

Figure 2. Finding channels and access cavity preparation: a - schematic diagram of b, c - preparing access cavities c, f - longitudinal section of the distal d, g - longitudinal section of the buccal

Figure 3. Ultrasonically activated endodontic instruments used for removing pivots and remnants of broken pins: a - the removal of access to the pivot, b - pin-scaling c - used as the active part of the peak-scaling pivot d - cross section through the active part of the tool used for removing material endodontic access, e - cross section the active part of the endodontic instrument used for scaling
Removal of a pivot scheme using ultrasonic activation is shown in figure 4. This was done in the following way: with a traditional or activated ultrasonic endodontic instrument is executed by the access cavity pivot. The same instrument is dug around the pivot support running a cavity (Fig. 4). It then uses activated ultrasonic endodontic instrument in Figure 4, placing first in the top ball I (a small cavity created by a classical instrument) and gently pressed axial pivot that begin to vibrate ultrasonically. Because each particle vibration of the pin, with a certain frequency and a certain amplitude, the combination of the material dezincrusting swivel bracket. The question then endodontic instrument in zone II and activates ultrasonic few seconds until reaching the pivot to move freely can then be removed easily. Then proceed to the appropriate root canal retreatment affected.

Ultrasonic technique to remove broken abutment using endodontic instruments shown in figure 3 presents the following advantages: minimal damage to the tooth and surrounding tissues, increased efficiency (time required to remove the pin is 4 ... 8 times lower than that of traditional techniques) allows proper restoration because it eliminates the risk of weakening, perforation or root fracture, no noise and reduce stress for both the patient and clinician. /1/,/4/,/5/,/6/.

Traditional techniques used for the extraction of silver cones are different intracanal obstructions have a number of disadvantages: consumes a lot of labor, sometimes consuming dentinal tissue to be removed to access the silver cone and enable it with a gripping endodontic instrument appropriate, it may break during removal operation making it impossible to remove the shortfall, may hinder subsequent retreatment removal of silver cones etc.

Figure 4. Pin removal using ultrasonic energy diagram: a - schematic drawing b - pin removal

The issues are complicated in the case of multiple heads swivel embedding, it is necessary to the execution of a help channel more and more attention and more time ultrasonic activation as helpful cavity takes longer to be processed and should be removed a large amount of dentin.

Figure 5. Radiographic appearance of a pivotal steps carved into the root canal.

Figure 6. Steps removal of silver cones canal using conventional techniques: a, b - schematic diagram of the execution cavity help around the silver cone to near apical third and the introduction of endodontic instruments around the cone, c - introducing endodontic instruments around the silver cone "in vitro" d - catching silver cone head with a suitable and endodontic instrument to extract

Experiments conducted on the use of ultrasound to remove silver cones assumed canal endodontic instrument using an ultrasonic activated as shown in figure 6, to help run the cavity surrounding the coronal part of the cone (Fig. 6) and then activate the ultrasonic silver cone using endodontic instrument tip ball.
should be discontinued when withdrawn activated ultrasonic endodontic instrument.

Then proceed to light extraction cone of silver and root canal retreatment.

Removal of silver cones intracanal technique using ultrasonic energy has a number of advantages, the most important being:

- Do not eat much dentin tissue because it allows precise execution cavity help existing material on the channel and it is inlaid silver cone. In some cases it is necessary to eat a small amount of dentine tissue depending on the position of the cone and the root canal silver, silver cone size of the root canal;
- Requires a minimum of labor consumption is reduced since the time required for 8 ... 9 times the conventional techniques, the ultrasonic activation of the implementation of the support stay 10 ... 30 s, and the ultrasonic activation of the silver plug 30 ... 60 s;
- Minimize the possible damage that may occur due to the position the silver cone.

2. CONCLUSIONS

1. The ultrasonic treatment using two types of ultrasonic devices that operate on the principle of magnetostriction phenomenon or principle piezoelectricității;

2. The most important part of an ultrasonic endodontic device is ultrasonic system to be so calculated, designed and manufactured to excite in him a certain type of Ultrasonic Wave (required by the specific application) and activated with ultrasonic endodontic instrument to work in the resonance;

3. To find the hidden channel and calcified, and to achieve easier access to the root canals is provided a first endodontic instrument and the specific activity of the central channel to allow the entry of a cooling fluid in the work area and to create the phenomenon of ultrasonic cavitation;

4. Ultrasonically activated endodontic instruments proposed to remove the obstacles intracannallary, and techniques advantages the following: a minimum of damage to the tooth and surrounding tissues, decreases the time required removal 4...8 times better as it allows a restoration risk of weakening, perforation or the root fracture and no noise.

5. Should be chosen very carefully during ultrasonic activation pin or silver cone because of risk and excess heat damage periapical and apical tissues and risk of rupture cone tip silver.
6. Extracting fragments of broken endodontic instruments from root canals is sometimes an extremely difficult even for the most experienced clinician, since it is still possible of endodontic treatment, or lead to surgery.

3. REFERENCES