

# Efficacy. ProTaper Next. removing filling materials from oval-Shaped canal during root canal retreatment

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**Abstract:** AIM: Assess efficacy removing filling material from oval-Shaped canals. Pro-Taper Next rotary files. Methods: 60 extracted human mandibular premolars instrumented up a size F2. ProTaper Universal Then filled gutta-Percha, AH-Plus sealer using continuous wave condensation technique. Then teeth divided 3 groups (N = 20). Filling material removed hand files (H) ProTaper Universal Retreatment (PTUR), ProTaper Next (PTN)... Debris extruded apical foramen collected, weighted. Working time recorded. Then teeth split longitudinally Observed

**KeyWords:** ProTaper next; Root canal retreat; NiTi files; Removal of filling material [Chinese Journal of conservation, 2018, 28(4.): 214]

Some studies show that the failure rate of root canal therapy is 15%~32%<sup>[1]</sup>. Microbial infection is the main reason for its failure.<sup>[2]</sup> As the preferred treatment and thoroughly remove the root canal filling<sup>[3]</sup>. Filling is a key link in root canal re-treatment. Root canal filling Removal methods include hand instruments, Nickel Titanium Machine, Portable Heat Exchanger, Chao<sup>[4]</sup>. Among them, nickel-titanium instruments have high efficiency because of their, It is widely used in root canal re-treatment because of its easy operation.

In recent years, with the improvement of material and instrument design, many new types of nickel-titanium files can be used not only for root canal shaping, but also for removing filling materials in root canal re-treatment.<sup>[5]</sup> ProTaper next (PTN) des more space. There are research reports, PTN In the bend There is still a lack of systematic study on the effect of the oval root canal filling removal.

The purpose of this study is to compare PTN With traditional re-treatment File ProTaper universal Retreatment (PTUR), Hand H The effect of root canal filling removal by file is expected to provide a reference for clinicians to choose re-treatment devices.

## 1. Materials and Methods

### 1.1 Main materials and instruments

PTUR, PTN, H File, X-Smart (Dentsply maillefer, Switzerland ); #25/0.06 Cone tip (BPKorea ); Ah plus (Dentsply, Switzerland ); Fluid Resin (3mUSA); Electronic Balance (Sartorius, Germany); Stereomicroscope (Olympus, Japan ); AutoCAD Software (Autodesk, Canada).

### 1.2 Sample Selection

Collection of mandibular premolars extracted for orthodontic treatment 60 I. Inclusion criteria: Root Tip development is complete; pulp treatment is not performed; root canal integrity and single root canal, root canal no

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absorption, Calcification, etc; Root canals are oval, reference Wu Wait.<sup>[8]</sup> The screening method Distance root tip 5mm Ratio of buccal tongue diameter to distal middle diameter of root canal > 2.; Root Curvature < 5 ° (Schneider Evaluation Method<sup>[9]</sup>). Removing teeth Stones on the Root Surface, Soft tissue soaked in saline for backup. 1.3. Method

Subtract 1mm Determined as working length; Using Emery car needles to grind part of the Crown, so that all samples working length is 16mm And then

ProTaper universal Crown-Down Technology ready F2 (#25/0.08). Use for each replacement 2 mL 25g/L NaClO Chong

Root canal washing, ready for use after completion 170 5 mL g/L EDTA Flush root canal 1 min 25g/L NaClO And distilled water

Agent to continuous wave Vertical Pressure Methods filling root tube fluid Resin Temporary closed root canal orifice after placed 37, 100% Humidity incubator in 4 Weeks stay sealant completely curing after for the following experimental.

### 1.3 Root canal treatment

Will 60A filling complete of sample random divided HFile, PTUR, PTN 3 Group (N = 20) Removal temporary a material respectively according to the following methods remove the root tube filling.

HFile Group: Respectively #3, #2 GG Drilling to gradually in-depth method removal root tube upper of gutta-percha #35~# Natural 20 HFile Crown down technology removal root tube lower of filling # Natural 20 HFile to work length then will root tip again preparation #40.

PTUR GROUP: InX-Smart Flooding dynamic horse up (Speed 500 r/min Torque 2 NCM) Under respectively D1 (#30/0.09), D2 (#25/0.08), D3 (#20/0.07) Remove the root on 1/3, Root in 1/3, Root Tip 1/3 Regional of filling material D3 To work length in turn "with machine with nickel titanium the mechanical F2, F3, F4 (#40/0.06) Complete root tube again pre- (Speed are

When instruments into root tube start timing exit root tube when suspended time Don't including replacement instruments and flushing root tube of time. When groups preparation ISO #40 And instruments blade no obvious debris when root tube preparation complete record Operation Total time (Accurate 0.01 s). At the same time record instruments Separation, Side Wear and complications of situation.

With tightly wrap package in vitro teeth outer surface only exposure root tip will in vitro teeth fixed in drilling of centrifuge tube cover. With su gan jiao seal connection parts to prevent liquid extravasation in centrifuge tube in Injection

ML 15g/L Agar solution will teeth fixed in centrifuge tube in and inverted make root immersion in agar solution in until SOLIDIFICATION." With Electronic Balance (D = 0.000 1g) The collection device Weighing after (Containing agar of centrifuge tube but don't contains teeth and tubes and caps) Will the device fixed in glass bottle in to observe the root tip of overflow situation at the same time avoid again Treatment Process operator fingers touch centrifuge tube (Figure 1). HFile Group,

## 2. Results

There were no complications such as device separation and root canal lateral puncture in each group. Clinical Operation Time (S) PTN Group (304.57 ± 49.83) With PTUR Group

290.97 ± 60.01) There was no statistical difference (P > 0.05) Two group was significantly less HFile Group (442.86 ± 50.43) (P < 0.05)

Table 1). Root tube overall filling residues (%) Observe the results display groups were can't completely clear root tube of filling, PTN Group

6.51 ± 1.75), PTUR Group (6.15 ± 1.06), HFile Group

6.94 ± 1.46) Root Tube Filling residues compared with no statistical difference (P > 0.05); Each group between root

on1/3,Root in1/3,Root Tip1/3

Filling of residues compared with no statistical difference ( $P>0.05$ );

In each group root on1/3,Root in1/3Of filling residues were significantly less than root tip1/3( $P<0.05$ )And root on1/3And root in1/3Compared no significant difference ( $P>0.05$ )(Table1).

Each group root tip debris of tui chu liang of compare the results display,PTNGroup at least,PTURFollowed,HGroup most between the two groups compared with statistical difference ( $P<0.05$ )(Table2).

Root canal treatment when should be as much as possible to remove root tube of filling material Material to exposure residual of necrosis organization and bacteria is completely the root tube[10]

Flushing,Disinfection of premise is also improvement in treatment success rate of key; Evaluation root tube filling clear efficiency can be indirect prediction root tube again treatment of Effect.This study aims to Through comparePTN,PTUR,Hand

HFile removal root tube filling of effect to clearPTNIn root canal treatment in Application Prospect.

Filling residues of evaluation methods main haveMicro-CTScanning Method,XLine Method,Teeth splitting method and.Micro-CTScanning method can from three-dimensional angle more accurate evaluation residual filling

Residual chip of detection don't sensitive lack of accuracy.With the stereo microscope of application teeth splitting method gradually was the methods is a kind of simple effective of evaluation methods.Has been study show that this methods is better

Filling lost.This study the teeth splitting method detection were filling residual have3A sample (Hand instruments Group2A,PTURGroup was damage and the replace. Root tube form is influence root tube again treatment Root Filling of clear effect Of important factors one compared round root tube oval root tube filling[5] Fill of the removal of more difficulty.This study selection of is single tube mandibular premolar are oval root tube screening methods referenceWU

Treatment for an arcane apical preparation diameter greater than initial preparation diameter filling of residues can significantly reduce.Therefore, this study in the root tip and then expand the were preparation#40.Solvent is removal filling of commonly used auxiliary methods but have scholars think was dissolved softening of gutta-percha will adhesion in

No dissolving agent was used in each group. The results show that the operation time needed to remove the root filling is, PTN,PTURGroup significantly lessHThe file group indicates that nickel-titanium instruments can remove the filling material more quickly and improve the working efficiency.

FasterPTN,TFAREciprocThe results may be related to the selection of central incisor as the research model and operator factors..

Studies have shown that there is no re-treatment equipment can be completely clear[19-20] Filling in the root canal.In this experiment, all groups have certain PTNAndPTURThe removal effect is similar, and is significantly better than the hand equipment.The difference may be due to different experimental designs,OzyurekThe experiment is in handHNot used in file groupGgCrown filling was removed by drilling, and no apical expansion was carried out in each group..

The preparation process of Root Canal re-treatment, the release of infected substances and root canal flushing fluid is the cause of inflammation.,Cause postoperative pain Good agar debris collection model using agar gel close to human tissue density (15g/L)By simulating periapical tissue, there is a certain resistance to the extrusion of debris. This method is more close to the clinical situation than the classic empty bottle collection model..The results show thatPTN,PTURThe amount of debris released by the group was significantly less than that of the hand.HFile Group,Pulling action can produce piston effect easy to Will debris of extrusion the root tip hole.In addition this results also display,PTNGroup isPTURGroup debris Also show that again treatment root tip debris of tui chu liangPTN,TFALess

InREciproc.PTNRoot Tip debris of tui chu liang is less its reason may from its unique of non-symmetry Rectangular Cross Section Design and on the snake-like movement has more of debris overflow space can timely will

debris to coronal launched. In addition also may and instruments of Taper related in relative should be diameter consistent when, PTNIsPTURTaper smaller its the produce of to root tip extrusion role also is small.

Comprehensive on the in this experimental conditions under we can from: In removal elliptical-shaped root tube of filling when, PTNNickel-titanium file system is security effective of and root tip debris of launch of is less. However this research conclusion not be applied to other root tube form and in vitro teeth Experimental and Clinical actual there are still some gap its clinical effect still to be further proved.

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