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BIOMECHANICAL BEHAVIOR OF ENDOSONICS

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Mladenovski, Ljupka Arsovski

Introduction:

- ultrasound in endodontics – endosonics
- way of work:



-Ni-Ti tip insertion and activation

-irrigation

-shaping

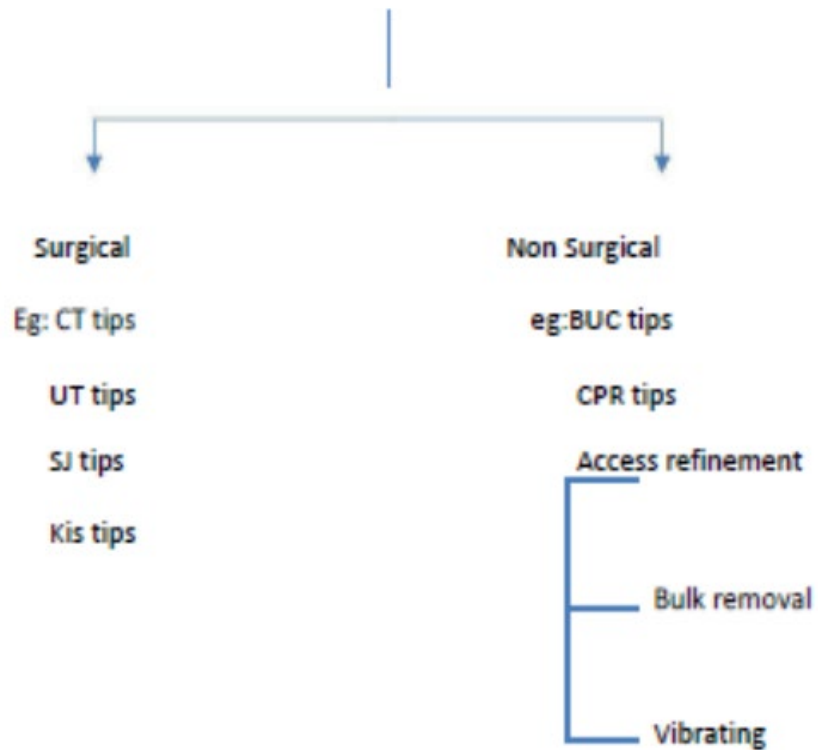
-flush out the debris and bacteria out of the canal system

Objective:

present the biomechanical work of endosonic in endocavity and its clinical application in modern day endodontic practice.

Types of endosonic

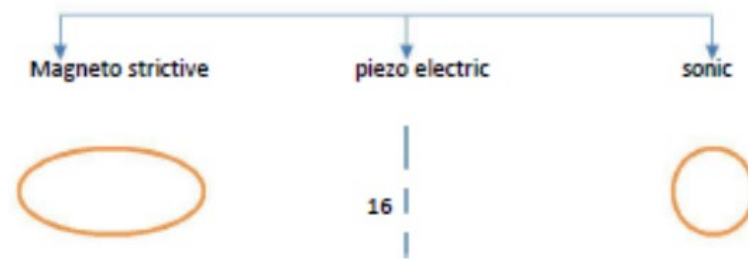
A) Based on the application




B) Based on materials



C) Based on the pathway of motion



Materials and methods: Literature review



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▪ Inclusion criteria:

- published articles written in English language,
- articles reporting results related to use and biomechanical work of endosonics,
- articles that are full reading text, with no publication date restriction

▪ Exclusion criteria:

- duplicate articles and
- articles with references that are not proven.

After implementation of inclusion and exclusion criteria, from the total 104 articles, 82 articles were discarded and only **22** articles were taken for detailed analysis.

Results and discussion

Table 1: Comparison of articles that have higher cleaning with different methods of biomechanical work of the endosonics

Author	Year	Higher cleaning efficiency with endosonics	Higher cleaning efficiency with acousting streaming of endosonics	Higher cleaning efficiency with cavitation of endosonics
Lee et al.	2004	✓		
van Der Sluis et al.	2007	✓		
Violich et al.	2010	✓		
Ahmad et al.	2009		✓	
Walmsley et al.	1988		✓	
Lumley et al.	2008		✓	
Lea et al.				✓
Tiong et al.				✓

- Gianluca Plotino et al.,
-piezoelectric units have advantages compared with magnetostrictive units.

- L. W. M. van der Sluis et al.,
-Passive ultrasonic irrigation can be performed with oscillating to induce powerful acoustic microstreaming.

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Review > J Endod. 2007 Feb;33(2):81-95. doi: 10.1016/j.joen.2006.10.008.

Ultrasonics in endodontics: a review of the literature

Gianluca Plotino¹, Cornelis H Pameijer, Nicola Maria Grande, Francesco Somma

Affiliations + expand
PMID: 17258622 DOI: 10.1016/j.joen.2006.10.008

Abstract

During the past few decades endodontic treatment has benefited from the development of new techniques and equipment, which have improved outcome and predictability. Important attributes such as the operating microscope and ultrasonics (US) have found indispensable applications in a number of dental procedures in periodontology, to a much lesser extent in restorative dentistry, while being very prominently used in endodontics. US in endodontics has enhanced the quality of treatment and represents an important adjunct in the treatment of difficult cases. Since its

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Review > Int Endod J. 2007 Jun;40(6):415-26. doi: 10.1111/j.1365-2591.2007.01243.x.
Epub 2007 Apr 17.

Passive ultrasonic irrigation of the root canal: a review of the literature

L W M van der Sluis¹, M Versluis, M K Wu, P R Wesselink

Affiliations + expand
PMID: 17442017 DOI: 10.1111/j.1365-2591.2007.01243.x

Abstract

Ultrasonic irrigation of the root canal can be performed with or without simultaneous ultrasonic instrumentation. When canal shaping is not undertaken the term passive ultrasonic irrigation (PUI) can be used to describe the technique. In this paper the relevant literature on PUI is reviewed from a MEDLINE database search. Passive ultrasonic irrigation can be performed with a small file or smooth

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- S.J. Lee et al.,
-ultrasonic irrigation
effective remove artificially
placed dentin debris.

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> Int Endod J. 2004 Sep;37(9):607-12. doi: 10.1111/j.1365-2591.2004.00857.x.

The efficacy of ultrasonic irrigation to remove artificially placed dentine debris from different-sized simulated plastic root canals

S-J Lee¹, M-K Wu, P R Wesselink

Affiliations + expand
PMID: 15317564 DOI: 10.1111/j.1365-2591.2004.00857.x

Abstract

Aim: To investigate the influence of diameter and taper of root canals on the effectiveness of ultrasonic irrigation to remove artificially placed dentine debris from simulated uninstrumented extensions in simulated root canals.

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▪ M. Ahmad et al.,
-ultrasound piezon Master 400 has
higher mechanical output than others
because of the oscillation mode.

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[Int Endod J. 1993 Mar;26\(2\):120-4. doi: 10.1111/j.1365-2591.1993.tb00553.x.](#)

The vibratory pattern of ultrasonic files driven piezoelectrically

M Ahmad ¹, R A Roy, A G Kamarudin, M Safar

Affiliations [+ expand](#)
PMID: 8330934 DOI: [10.1111/j.1365-2591.1993.tb00553.x](#)

Abstract

The pattern of oscillation of a Piezon-Master 400 ultrasonic file driven by a piezoelectric transducer was studied in air and on water. In addition, the displacement amplitudes of the files were measured. The findings were compared with those observed with the Cavi-Endo unit reported in another study (Ahmad 1969). It was observed that the file vibrated such that a standing wave was formed on the file and it exhibited points of maximum deflection (antinode) and points of minimum deflection (node)

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CONCLUSION:

- ENDOSONIC HAS MANY ADVANTAGES IN CLINICAL ENDODONTICS (ENDOSONICS REDUCE THE NEED FOR INVASIVE PROCEDURE).
- Helps in finding calcified canals and removal of attached stones
- Improve cleaning and shaping of root canals particularly in difficult situations in which a specific angulation or tip design permits access
- Preserve more of the natural structure
- retreatment
- removal of separated broken instruments or posts
- Reduce treatment time
- Improve treatment outcomes

teaching ass. Verica Toneva Stojmenova 

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