Journal Club Presentation

Dr. Anas F Mahdee
Professor in Endodontology
College of Dentistry University of Baghdad

It is a vital and core activity of any research to gather and discuss about a published article.

This discussion is to criticise the knowledge and evaluate the content presented in published article.

Critical appraisal

It is the process of carefully and systematically examining research to judge its trustworthiness, value and relevance in a particular context.

They are skills that enable practitioners to apply laws of logic to published clinical data so they may estimate the validity, reliability, and utility of the information presented in the article (Macrae et al., 2004).

NOT EVERYTHING THAT IS PUBLISHED IS CORRECT!!

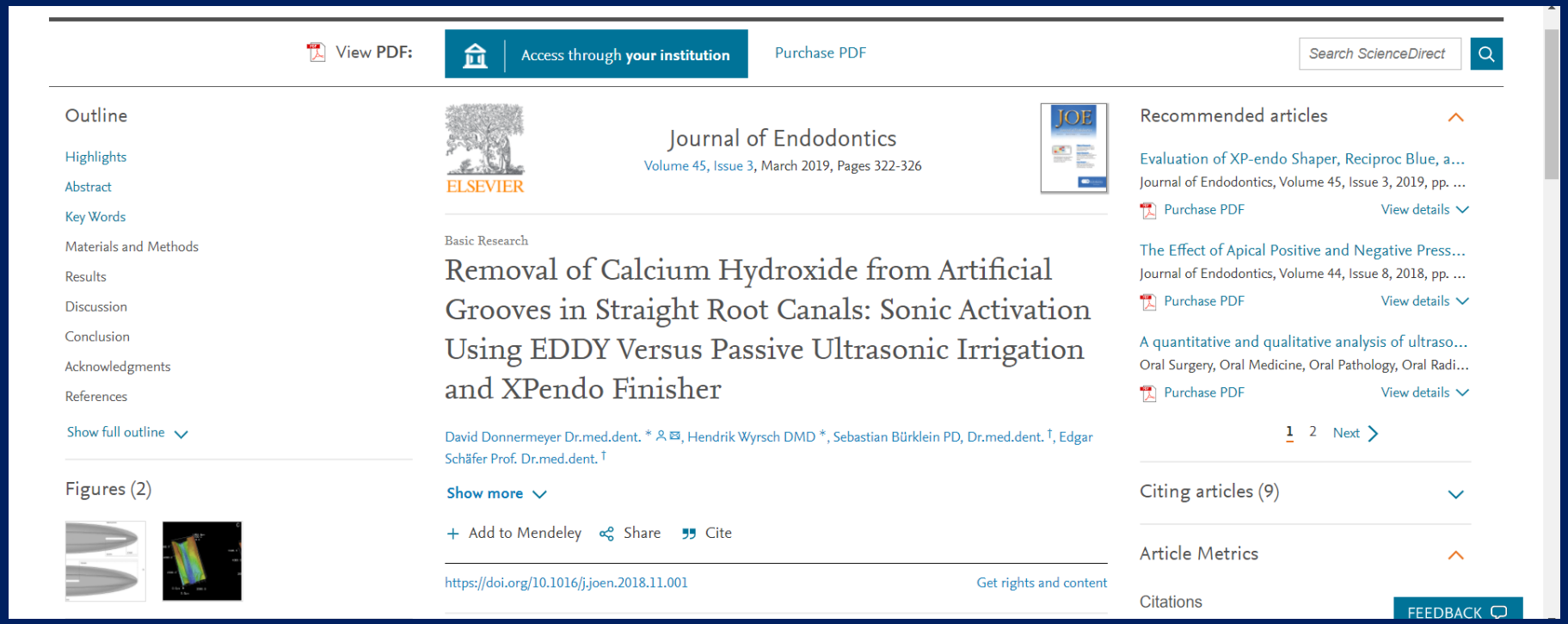
Amis of the Journal Club

- To develop the ability of researcher to critically analyse research articles and continuously evaluate the published scientific knowledge.
- To improve the critical appraisal skills for the researchers.

Amis of the Journal Club

- To understand the method of publication.
- To increase the knowledge about the research methodology and biostatistics.
- To improve clinical practice by increasing the exposure to the latest research findings.

Journal Club Presentation



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Outline

Highlights
Abstract
Key Words
Materials and Methods
Results
Discussion
Conclusion
Acknowledgments
References

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Figures (2)

ELSEVIER

Journal of Endodontics
Volume 45, Issue 3, March 2019, Pages 322-326

Basic Research

Removal of Calcium Hydroxide from Artificial Grooves in Straight Root Canals: Sonic Activation Using EDDY Versus Passive Ultrasonic Irrigation and XPendo Finisher

David Donnermeyer Dr.med.dent. *, Hendrik Wyrsch DMD *, Sebastian Bürklein PD, Dr.med.dent. †, Edgar Schäfer Prof. Dr.med.dent. †

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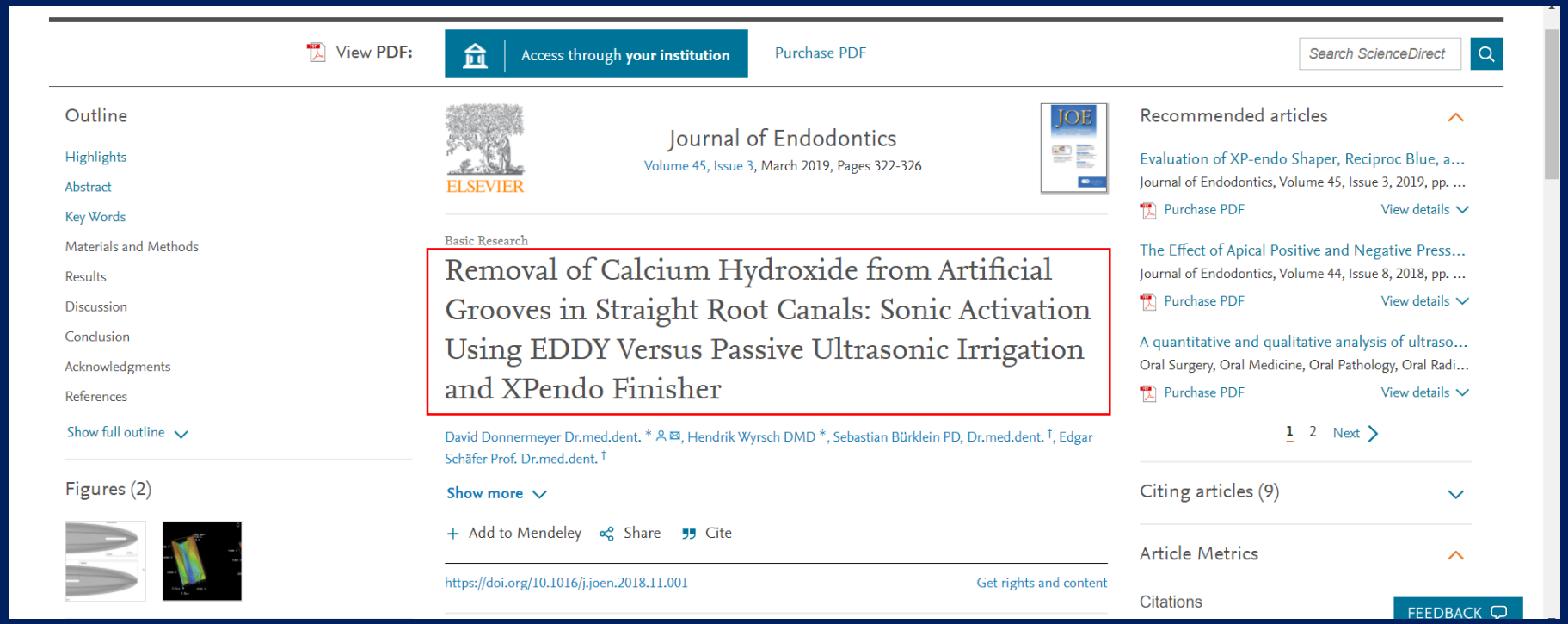

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  - ✓ Is this title long or short
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- Journal details:

  Names of Journal: JOE

  Journal description: Official journal of the American Association of Endodontists.

  Peer reviewed hybrid access journal.

  Impact Factor and Cite Score:

  (index for Clarivate) (index for Elsevier)

  Publisher: Elsevier

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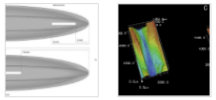

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Removal of calcium hydroxide from artificial grooves in straight root canals: sonic activation using EDDY versus passive ultrasonic irrigation and XPendo Finisher

D Donnermeyer, H Wyrsch, S Bürklein, E Schäfer - Journal of endodontics, 2019 - Elsevier

Introduction The aim of the present study was to compare sonic activation using EDDY (VDW, Munich, Germany), passive ultrasonic irrigation (PUI), and mechanical activation using the XPendo Finisher (FKG Dentaire, La Chaux-des-Fonds, Switzerland) for the removal of calcium hydroxide from artificial grooves in straight root canals. Methods The root canals of 90 human maxillary incisors with straight root canals were prepared using Mtwo files (VDW) up to size 40/.04, and the teeth were split longitudinally. A lateral groove in the …

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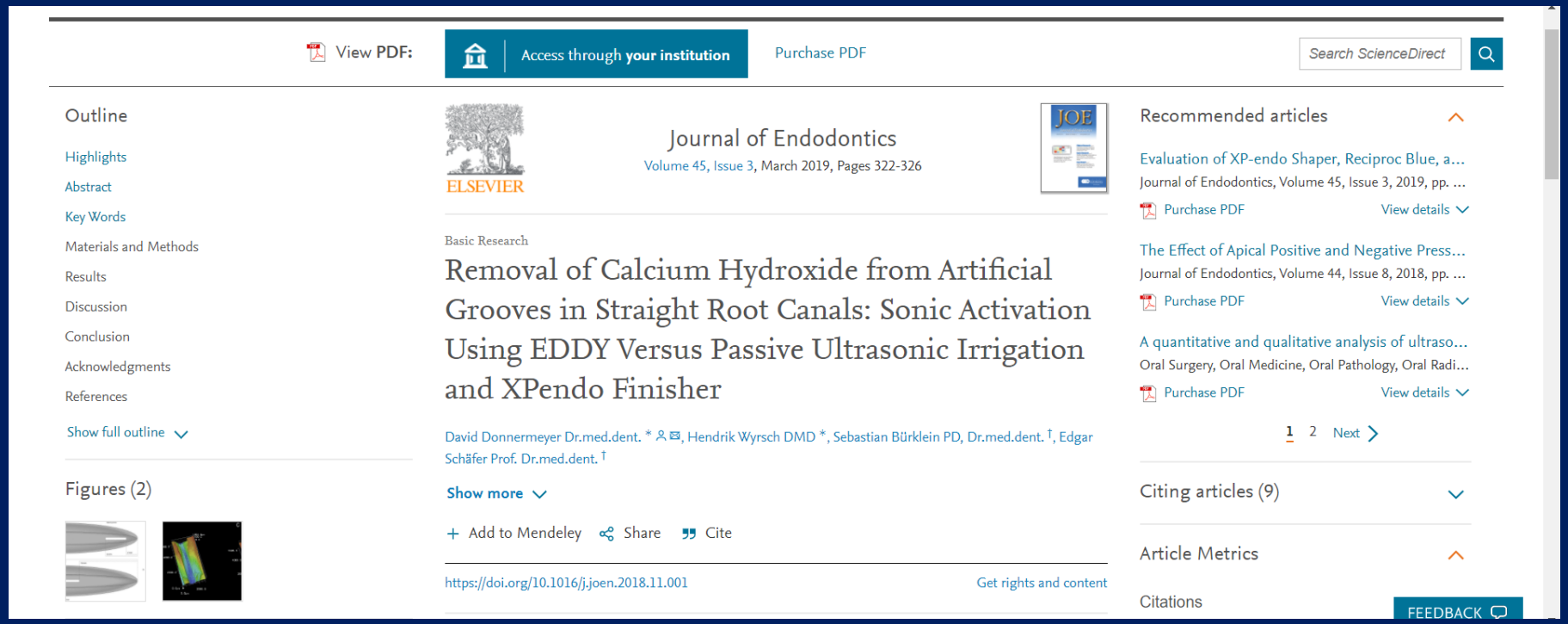

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Article Metrics

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- Type of study: Experimental in vitro study

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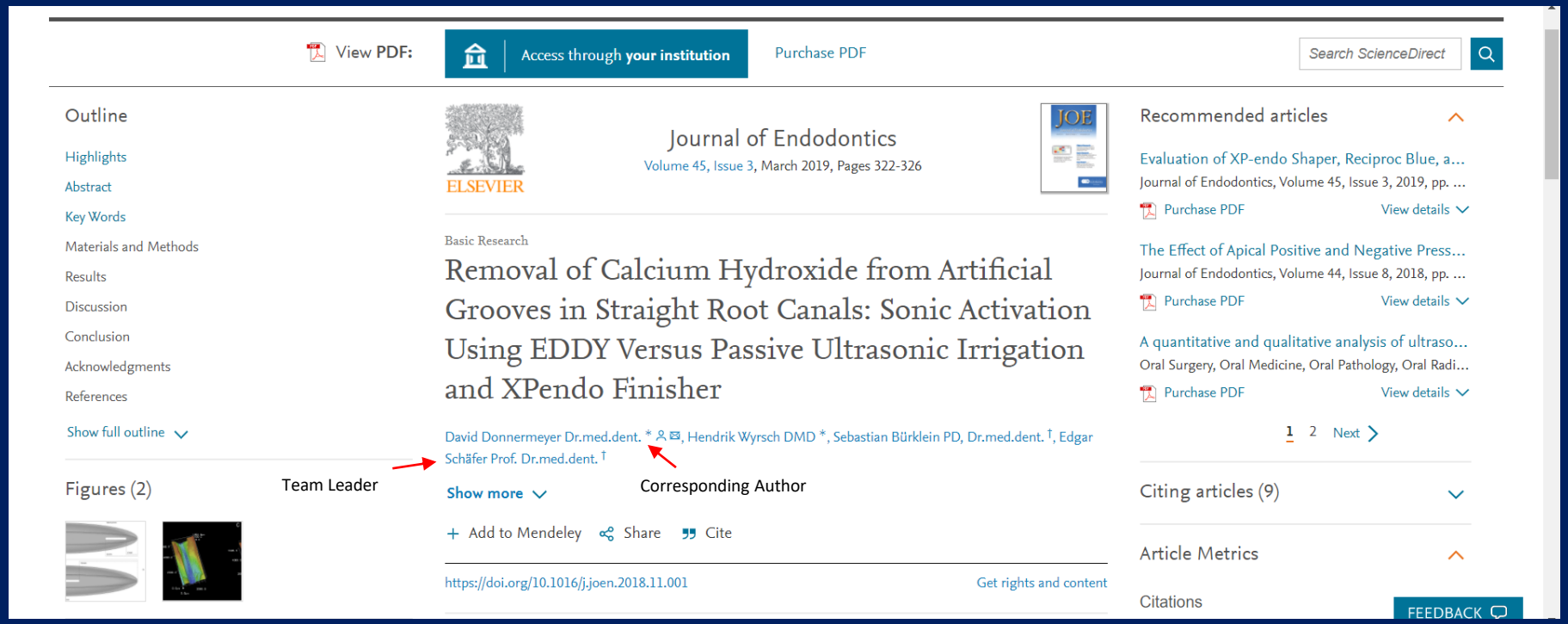

- Authors and Authorship

  Names, Affiliation, Contribution

  You can give some information about one of the authors if they are famous in the field

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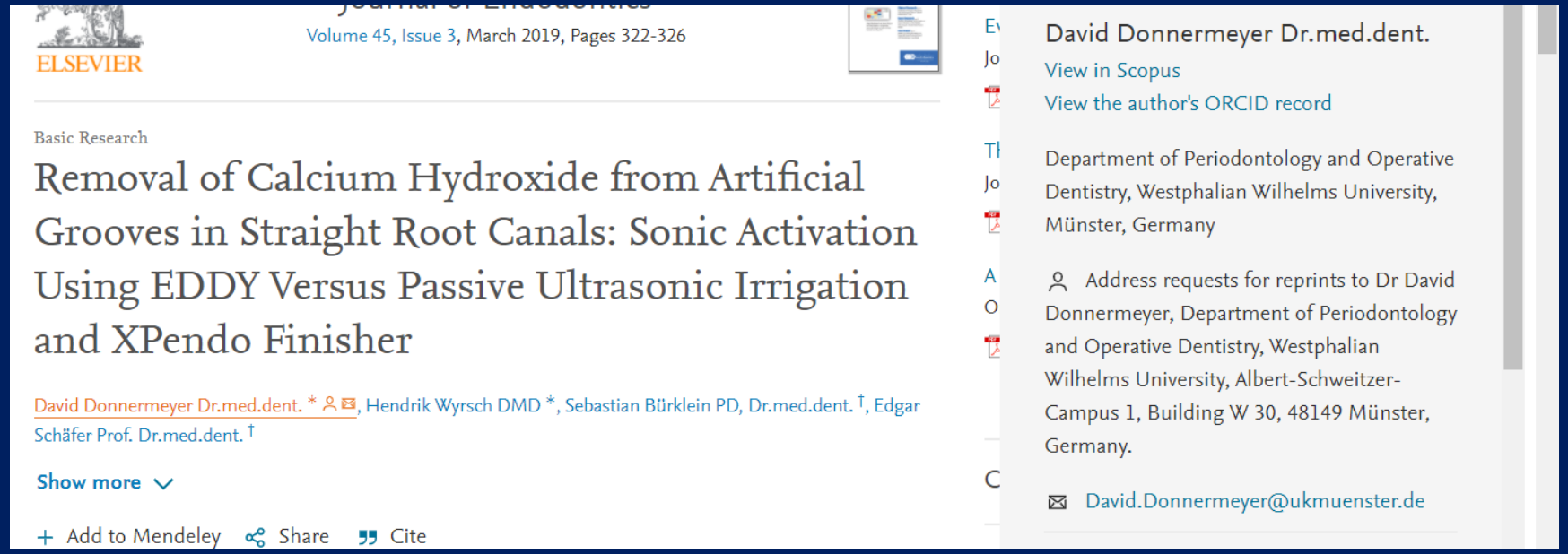

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David.Donnermeyer@ukmuenster.de

- Authors and Authorship

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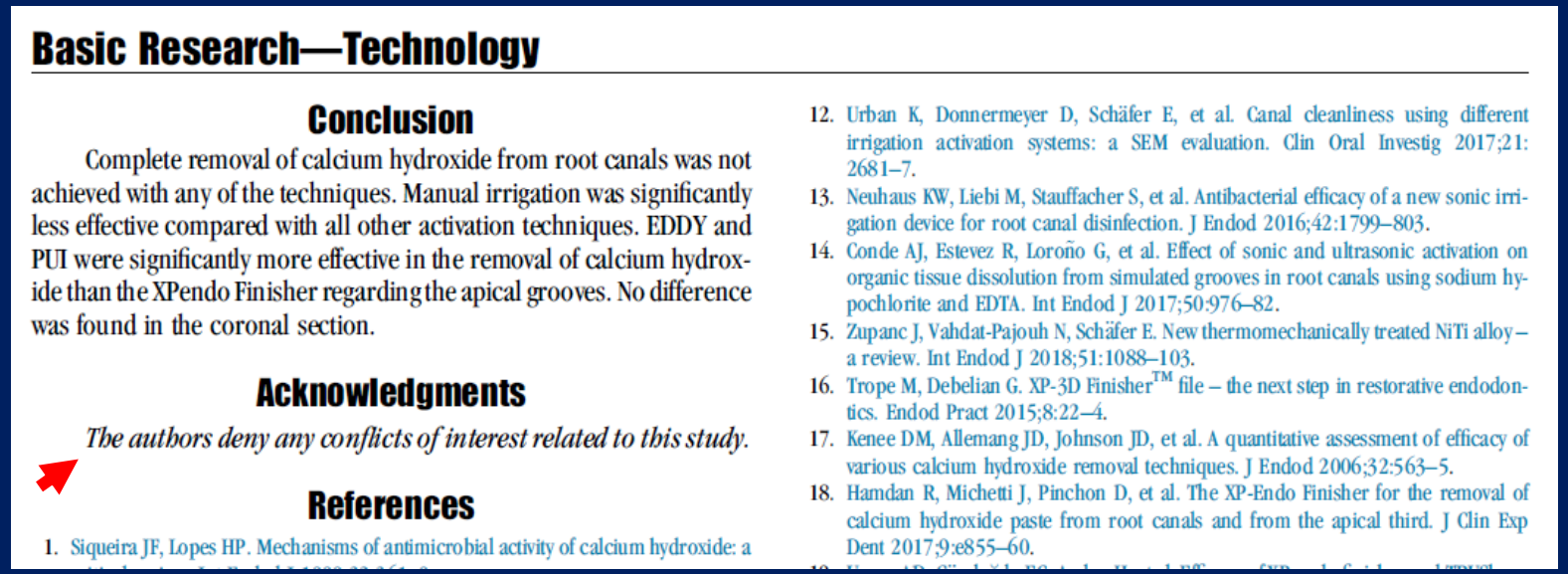
- Conflict of interest: it is important to evaluate the bais that the author may have with the results of the study



Basic Research—Technology

Conclusion

Complete removal of calcium hydroxide from root canals was not achieved with any of the techniques. Manual irrigation was significantly less effective compared with all other activation techniques. EDDY and PUI were significantly more effective in the removal of calcium hydroxide than the XPendo Finisher regarding the apical grooves. No difference was found in the coronal section.

Acknowledgments

The authors deny any conflicts of interest related to this study.

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Journal Club Presentation

- Introduction:

  Is the author give a good background about the literature in the flied of the topic.

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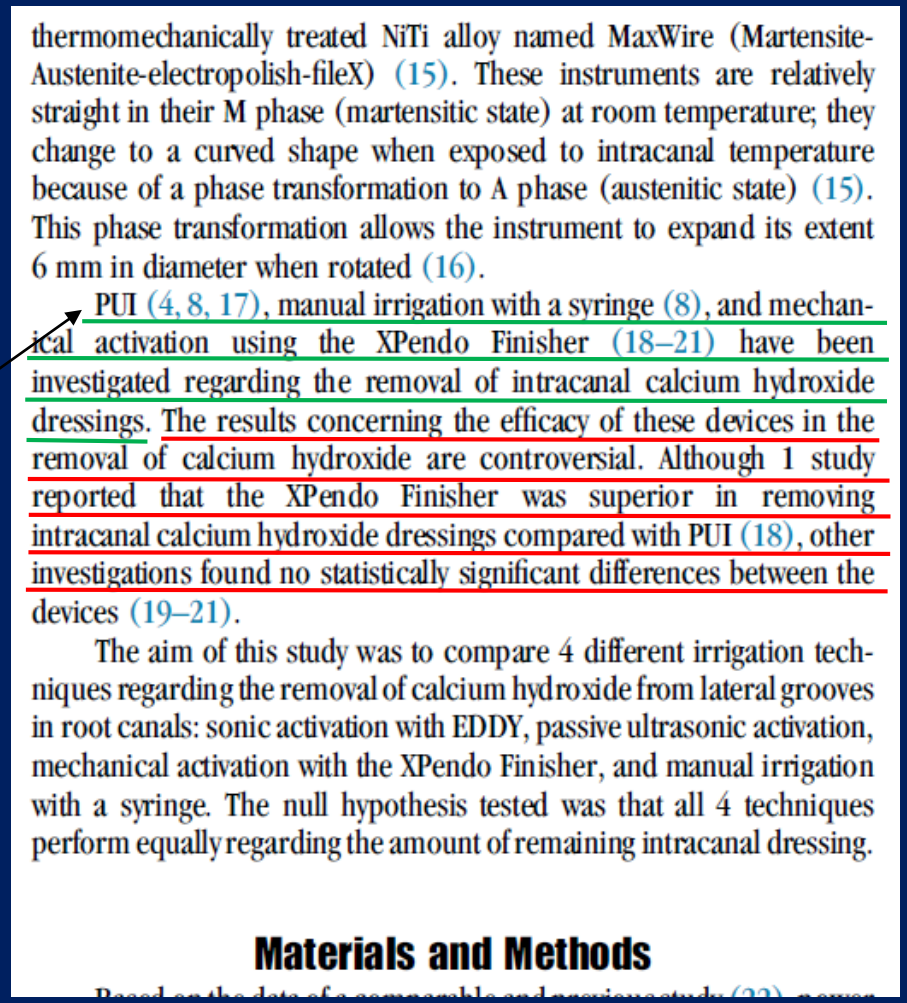
- Problem statement

  Is the problem vital and stated in a clear sentence.

Passive ultrasonic irrigation



thermomechanically treated NiTi alloy named MaxWire (Martensite-Austenite-electropolish-fileX) (15). These instruments are relatively straight in their M phase (martensitic state) at room temperature; they change to a curved shape when exposed to intracanal temperature because of a phase transformation to A phase (austenitic state) (15). This phase transformation allows the instrument to expand its extent 6 mm in diameter when rotated (16).

PUI (4, 8, 17), manual irrigation with a syringe (8), and mechanical activation using the XPendo Finisher (18–21) have been investigated regarding the removal of intracanal calcium hydroxide dressings. The results concerning the efficacy of these devices in the removal of calcium hydroxide are controversial. Although 1 study reported that the XPendo Finisher was superior in removing intracanal calcium hydroxide dressings compared with PUI (18), other investigations found no statistically significant differences between the devices (19–21).

The aim of this study was to compare 4 different irrigation techniques regarding the removal of calcium hydroxide from lateral grooves in root canals: sonic activation with EDDY, passive ultrasonic activation, mechanical activation with the XPendo Finisher, and manual irrigation with a syringe. The null hypothesis tested was that all 4 techniques perform equally regarding the amount of remaining intracanal dressing.

Materials and Methods

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- Problem statement

  Is the problem is vital and stated in a clear sentence.

- Aims/ Objectives

  Are the aims directed toward solving the problem.

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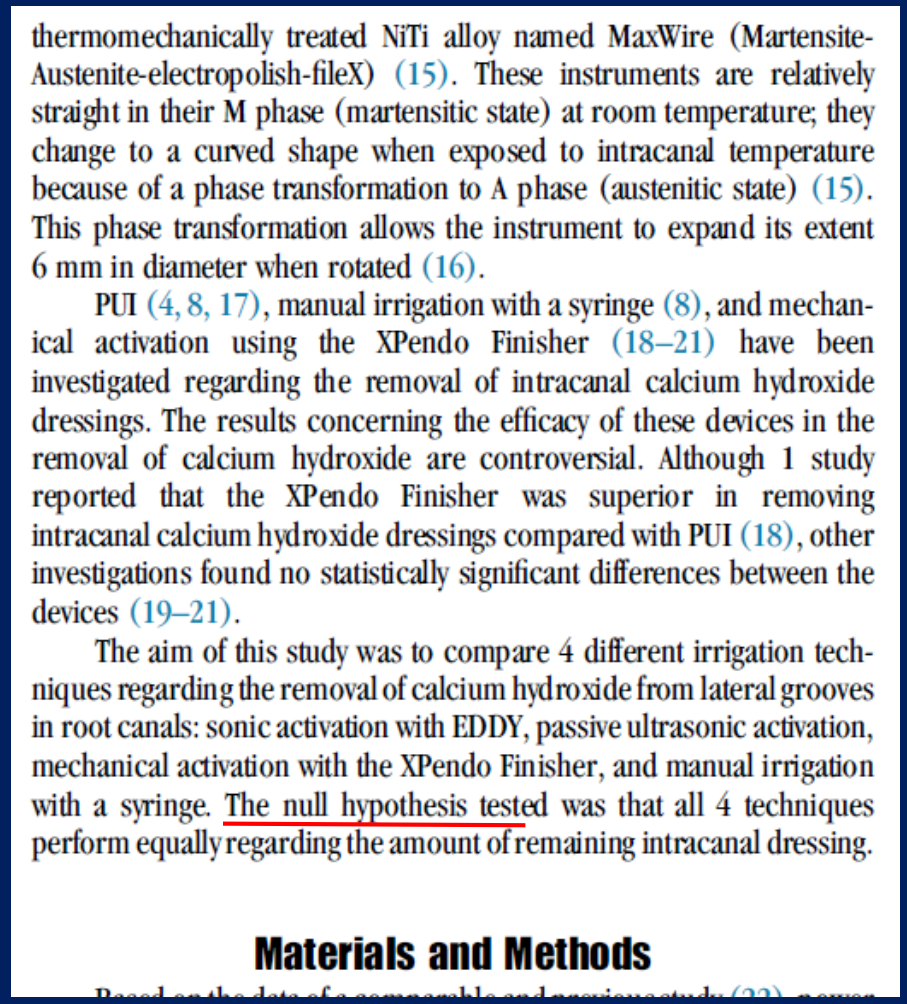
  Are the aims directed toward solving the problem.

- Hypothesis

  Is the hypothesis simple and correct.



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Materials and Methods

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- Materials and Methods: critically explore each part of the method to understand the research methodology and to compare the work with other similar methods in literature. This could include the dependant articles that the author may use in the design of their method.

Journal Club Presentation

Method design

Is methodology designed according to pilot study or previous investigations

Pilot study (if present)

Materials and Methods

Based on the data of a comparable and previous study (22), power calculation using G*Power 3.1 (Heinrich Heine University, Düsseldorf, Germany) indicated that the sample size for each group should be at least 17. Thus, 20 canals were used for each experimental group.

The present study is based on study designs previously suggested (8, 23). Ninety extracted central maxillary incisors with straight single roots (curvature <5°), a length of a minimum of 18 mm, intact root tips, and a single root canal were included. This was verified by viewing their buccal and proximal radiographs and the measurement

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Sample size

Validity of the sample size or population of the study.

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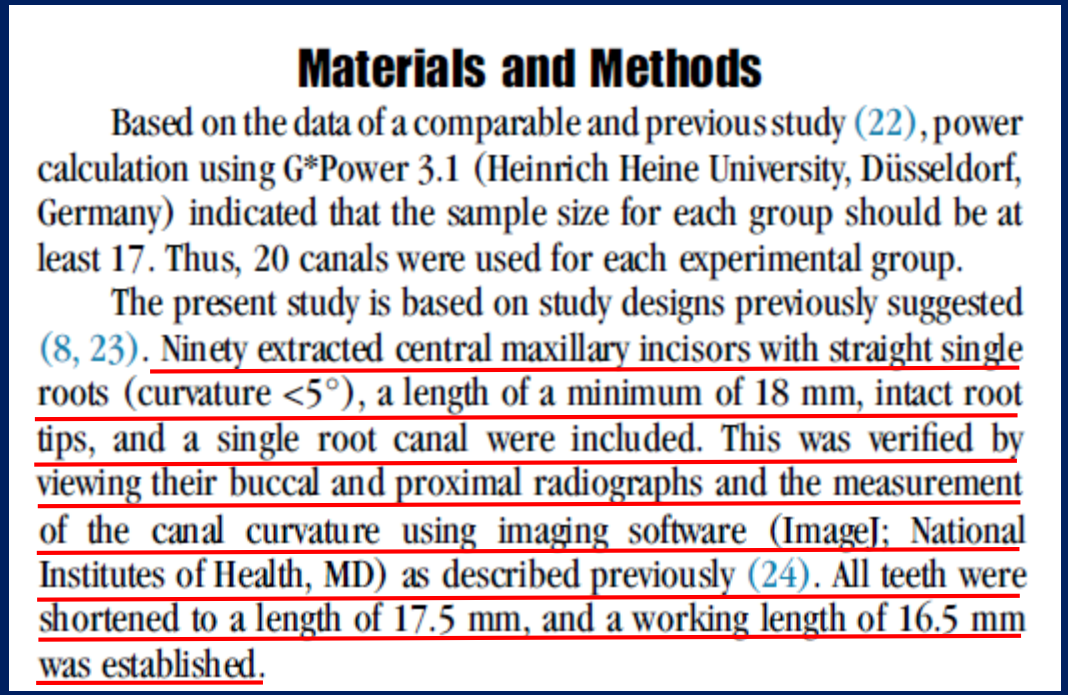
Sample type

- Criteria for sample selection.
- Inclusion or exclusion criteria.
- Are the selection procedure valid and not bias.



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Eg. The initial size for the selected root was not none

Journal Club Presentation

Sample preparation

-Explore the sample preparation critically to identify if there is a weak or unstandardized step during the procedure.
-Evaluate the steps of method during the presentation

After preparation of the access cavity, the root canals were instrumented using Mtwo NiTi files (VDW) up to size 40/.04 using the torque-limited electric motor VDW.Silver (VDW) with the settings according to the manufacturer's instructions. Apical patency was checked before instrumentation and after each instrument using ISO size 10 K-files (VDW). During instrumentation, irrigation was performed with a 30-G open-ended needle (Navitip; Ultradent, South Jordan, UT) and 1.5 mL NaOCl 3% after each instrument. The final irrigation was performed with 5 mL EDTA 17% (contact time of 1 minute). All irrigation solutions were used at a temperature of 20°C.

After the preparation of 2 longitudinal grooves at the mesial and distal root surface, the roots were split longitudinally. Gap-free reassembly of the 2 root halves was checked with a stereomicroscope under 20× magnification (Expert DN; Müller Optronic, Erfurt, Germany).

Two grooves (4-mm long, 0.2-mm wide, and 0.5-mm deep) were prepared at 2 levels at a distance of 2–6 mm from the apex on the buccal side of the root canal and at a distance of 10–14 mm from the apex on the oral side of the root canal (Fig. 1). Individual silicone molds (Silaplast; Detax, Ettlingen, Germany) were made for each root half to maintain a constant position, and photographs were taken under 10× magnification using a laser scanning microscope (VK-X100; Keyence, Osaka, Japan). The grooves were filled with an aqueous calcium hydroxide suspension, and photographs were taken at 10× magnification.

The root halves were reassembled and fixed with wax. The apical foramen was covered with wax in order to simulate a closed system (25), and the roots were embedded into plastic tubes with silicone (Silaplast). After storing the specimens in an incubator (Memmert, Schwabach, Germany) at 37°C and 100% humidity for 7 days, the roots were

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Sample grouping

-The sample grouping randomisation procedure has to be mentioned to avoid bias and ensure validity.
-All groups should have similar sample size (including controls).
-The control samples should be processed under similar conditions.

laplast). After storing the specimens in an incubator (Memmert, Schwabach, Germany) at 37°C and 100% humidity for 7 days, the roots were randomly divided into 5 groups. Further procedures were as follows (groups A–D, $n = 20$; group E, $n = 10$).

Not clear randomisation procedure

Group A: Sonic Activation with EDDY

Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The irrigant was activated with a frequency of 6000 Hz and an amplitude of 160 μm using an air scaler (KaVo SONICflex; KaVo, Biberach, Germany). The EDDY tip was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

Group B: PUI with VDW Ultra (VDW)

Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The irrigant was activated as recommended by the manufacturer with a frequency of 28,000 Hz using a file size of 25 (Irri-S 21/25, VDW). The Irri-S tip was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

Group C: Mechanical Activation with the XPendo Finisher

The XPendo Finisher NiTi file was used as recommended by the manufacturer at a speed of 1000 rpm and a maximum torque of 1 Ncm using the torque-limited electric motor VDW.Gold (VDW). Before each cycle of activation, 3 mL NaOCl 3% was applied to the root canal with a syringe. The XPendo Finisher file was placed 1 mm short of the working length, and in-and-out movements with an amplitude of 5 mm were performed. Irrigation was repeated 4 times for 30 seconds, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

Group D: Manual Passive Irrigation with a Syringe

A 5-mL syringe with a 30-G needle (Navitip) was placed 1 mm short of the working length into the canal, and in-and-out movements with an amplitude of 5 mm were performed; 3 mL NaOCl 3% was applied over 30 seconds. This was repeated 4 times, resulting in a total of 2 minutes of irrigation with a total of 12 mL irrigant.

Group E: The Control Group

No irrigation was performed. The root canals were dried with paper points, and the root halves were separated again. Photographs were taken at 10× magnification using the individual silicone molds and the laser scanning microscope (Fig. 2*A*–*C*).

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Testing procedure

-Types of the tests used and giving brief description about each.
-Are these tests performed in a correct way?

per points, and the root halves were separated again. Photographs were taken at 10× magnification using the individual silicone molds and the laser scanning microscope (Fig. 2*A*–*C*).

The amount of calcium hydroxide remaining in the grooves was independently scored by 2 calibrated and blinded operators according to the scoring system suggested by Lee et al (23). The calibration of the operators included scoring and discussion of 50 specimens 5 days before the blinded scoring procedure.

The following scores were used: 0, empty groove; 1, <50% of the cavity is filled with calcium hydroxide; 2, >50% of the cavity is filled with calcium hydroxide; and 3, the cavity is completely filled with calcium hydroxide. The scoring results were expressed as medians and analyzed using the Kruskal-Wallis test. The level of significance was set $P = .05$. The Cohen kappa value was calculated for interexaminer agreement.

Journal Club Presentation

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-Types of the tests used and giving brief description about each.
-Are these tests performed in a correct way?

Measurements

-How the variable measured?
-Check for miss information bias or detection bias.
-Check for masking or blinding.

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Statistical analysis

-How were the data analysed.
-Appropriate test.

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Journal Club Presentation

- Results

  - What are the results?
  - Are they clearly presented and understandable?
  - How were the results interpreted?
  - Are the interpretations appropriate?

TABLE 1. The Scoring Results of the Apical and Coronal Grooves

	Group	Median	Interquartile range	Minimum	Maximum
Apical	EDDY	1.0[a]	2.0	0.0	3.0
	PUI	1.0[a]	2.0	0.0	3.0
	XPendo Finisher	2.5[b]	1.0	1.0	3.0
	Manual irrigation	3.0[c]	0.0	2.0	3.0
	Control group	3.0[c]	0.0	3.0	3.0
Coronal	EDDY	2.0[a]	2.0	0.0	3.0
	PUI	2.0[a]	1.0	0.0	3.0
	XPendo Finisher	2.5[a]	1.0	1.0	3.0
	Manual irrigation	3.0[b]	0.0	2.0	3.0
	Control group	3.0[b]	0.0	3.0	3.0

PUI, passive ultrasonic irrigation.

Values with different superscript letters were statistically different at $P = .05$ (Kruskal-Wallis test).

Journal Club Presentation

- Discussion

-Is the discussion directed toward the research question of study and the aims.

-Is the author discuss the methodology and the standardisation procedures of the work.

-What are the strengths of the study?

-Is controversy presented about the topic (agreement, disagreement) and is the author discuss that according to the results of the study.

Journal Club Presentation

- Discussion

-What are the study weaknesses, limitations and flaws?

Do the author mention them?

transformation to A phase (austenitic state) (15, 16). In the present study, attempts have been made to standardize experimental conditions, and, therefore, all irrigation solutions were used at a temperature of 20°C. Based on the obtained results, it might be of interest to reevaluate the dressing removal capacity of XPendo Finisher files using increased and different temperatures of the irrigants.

Journal Club Presentation

- Conclusions

  -Is the conclusions summarising the findings of the study.

  -Do the findings contribute to the overall knowledge of the topic.

  -What additional questions does the study raise.

Journal Club Presentation

Pros and Cons

Give a summery about the Pros and Cons that you found in each section of the study. E.g.

Pros	Cons
Good study design	The procedure of randomised sample grouping is not presented.
Valid research question	The testing procedure is vague and not clear.

References

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