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International Journal of Advanced Research

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REVIEWER'S REPORT

Manuscript No.: IJAR-58080

Title: COMPARATIVE EVALUATION OF SEALING ABILITY OF FOUR DIFFERENT ROOT REPAIR MATERIALS USED FOR FURCATION PERFORATION REPAIR: AN INVITRO STUDY.

Recommendation:

Accept as it is .....

Accept after minor revision.....Yes.....

Accept after major revision .....

Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	•			
Techn. Quality	•			
Clarity	•			
Significance		•		

Reviewer's ID: JPR-Dr. Sireesha Kuruganti

Detailed Reviewer's Report

Overall Assessment:

The manuscript investigates an important topic in endodontics by comparing the sealing ability of four root repair materials for furcation perforation repair using a protein leakage model. The topic is clinically relevant because successful management of furcation perforations directly influences treatment prognosis.

However, the manuscript contains numerous issues related to scientific writing, methodology, statistical analysis, presentation of results, interpretation of findings, language quality, and reporting standards. Significant revisions are necessary before publication.

Major Comments

1. Title needs improvement (Lines 3-5)

The title is lengthy and repetitive.

2. Abstract requires restructuring (Lines 7-21)

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Problems:

a) Missing numerical data

The abstract only provides some mean values without clear comparative statistics.

Include:

ANOVA results

p-values

Ranking of materials

b) Conclusion is grammatically incorrect

Current:

> "Because of the better handling properties, could be used as alternatives..."

Suggested:

> "Bio-C Repair and Bio MTA may be considered suitable alternatives for furcation perforation repair due to their superior sealing ability and favorable handling characteristics."

c) Contradictory statement

Line 20:

> "...better sealing ability when compared with Biodentine."

However, Biodentine itself showed reasonably good performance.

Avoid overgeneralization.

3. Introduction requires strengthening (Lines 23-34)

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Problems:

The introduction is too brief.

Missing:

a) Literature gap

The authors never clearly state:

What gap exists in previous studies?

Why compare these four materials specifically?

Add a paragraph:

> "Although several studies have evaluated MTA and Biodentine, limited literature exists comparing newer materials such as Bio-C Repair and HIDENSE using a protein leakage model."

b) Objectives should be more specific

Current:

> "...explore the sealing ability..."

Suggested:

> "To quantitatively compare the sealing ability of HIDENSE, Bio MTA, Biodentine and Bio-C Repair using a protein leakage assay."

4. Ethical approval information incomplete (Lines 36-38)

Authors mention:

> "...after obtaining approval from ethical committee..."

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Missing:

Ethics approval number

Date of approval

Should include:

> Institutional Ethics Committee Approval No: XXX/2025.

This is mandatory.

5. Sample size justification absent (Lines 40-41)

Problem:

80 teeth were selected.

Missing:

Power analysis

Sample size calculation

Authors must provide:

Effect size

Statistical power (80% or 90%)

Software used (e.g., G*Power)

Without justification, sample adequacy is questionable.

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6. Randomization process not described (Lines 51-56)

Authors state:

> "samples were categorized into five groups"

Missing:

Method of randomization

Questions:

Computer-generated randomization?

Lottery method?

Block randomization?

Authors should specify.

7. Methodology lacks reproducibility (Lines 57-79)

Several important details are absent.

Missing information:

a)

Who performed perforations?

Single operator?

Multiple operators?

b)

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Operator calibration missing.

c)

No mention of blinding.

Questions:

Was the investigator blinded?

Was the spectrophotometer operator blinded?

d)

Perforation depth absent.

Authors mention:

> 2 mm diameter

But depth is not reported.

8. Protein leakage methodology insufficient (Lines 73-79)

Authors should report:

UV spectrophotometer model

Wavelength used

Calibration procedure

Current statement:

> "Protein concentration was quantified with ultraviolet spectrophotometer."

Insufficient for reproducibility.

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9. Statistical analysis section is incorrect (Lines 81-84)

Several problems exist.

Authors state:

> Comparison between groups was done by One way ANOVA.

Then:

> Intragroup comparisons were done by One way ANOVA.

This is incorrect.

Questions:

Intragroup comparisons across time require:

Repeated measures ANOVA

or

Mixed effects model

Also missing:

Post-hoc test (Tukey HSD, Bonferroni etc.)

Authors should clearly state:

> One-way ANOVA followed by Tukey's post hoc analysis.

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10. Standard deviation error (Lines 88-90)

Reported:

HIDENSE = 0.57 ± 0.56

This SD is suspicious.

The standard deviation is almost equal to the mean.

Authors should verify calculations.

Possibilities:

Typographical error

Data entry error

11. Results presentation is inadequate (Lines 91-99)

Current presentation lacks:

Missing:

Confidence intervals

Effect sizes

F-statistic

Degrees of freedom

Should include:

> F(df)=value, p=value

instead of only p-values.

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12. Discussion is largely descriptive (Lines 100-186)

Problems:

The discussion mostly summarizes previous studies.

Missing:

a)

Critical analysis.

b)

Mechanistic explanation.

For example:

Why Bio-C Repair performed better?

Possible reasons:

Nanoparticle size

Hydrophilic properties

Expansion upon setting

Superior marginal adaptation

Authors should explain.

13. No limitations section

The study lacks limitations.

Authors should add:

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Limitations

1. In vitro study design

2. Oral conditions not simulated

3. No thermocycling

4. No mechanical loading

5. Small sample size

6. Only sealing ability assessed

7. Long-term biocompatibility not evaluated

14. Conclusion overstates findings (Lines 187-192)

Current:

> "...could be used as alternatives..."

Strong clinical recommendations should not be made from an in vitro study.

Replace with:

> "Bio-C Repair and Bio MTA demonstrated promising sealing ability in vitro; however, further in vivo and long-term clinical studies are required."

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Table and Figure Comments

Table 1

Issues:

Decimal precision inconsistent.

SD formatting inconsistent.

Units not specified.

Add:

Protein leakage absorbance values (AU).

Graph 1

Issues:

Low resolution.

No error bars.

No significance indicators (*).

Improve graphical presentation.

Table 2

Issues:

Incomplete comparison table.

Pairwise comparisons not fully reported.

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Statistical test not mentioned.

Authors should provide all pairwise comparisons.

Overall Strengths

1. Clinically relevant topic.

2. Includes newer biomaterials.

3. Uses protein leakage assessment.

4. Adequate number of samples.

5. Practical application in endodontics.