

To Evaluate Absorbency Property Of Different Brands Of Endodontics Paper Points – An In Vitro Study

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Abstract:

Background: Three dimensional root canal filling, an indispensable condition to isolate the root canal system in endodontic therapy, cannot be achieved if the extirpated and prepared canal is not dry before obturation. The absorbent paper points are made of wood fibers, cotton fibers and sodium silicate, with great water absorption and flexibility. Absorbent paper points are used not only to dry root canals after irrigation, but also to carry antiseptic or disinfecting dressings, and to transfer bacteriological samples from the root canal to the culture medium.

Materials and Methods: Standardized endodontic absorbent paper points, size 30, from three different brands were used for the study. {DiaDent, META and SureEndo} Five absorbent paper point from each brand were selected from packages with assorted points.

A total of 15 points were tested.

Each dry paper point were weighted using an electronic weighing balance.

A length of 16 mm from the tip was then lowered in the distilled water for 5 seconds. The paper point was weighted again, and the difference between both the measurements was taken as a value of fluid absorbed.

Results: DiaDent and Sure-Endo shows the higher Fluid absorbency and Dry weight than META. The Post Immersion weight for the DiaDent appears to be slight increased than Sure-Endo. Meta shows least rate for post immersion, fluid absorbed and dry weight as compare to other two groups.

Conclusion: META shows the lowest value for fluid absorbed, dry weight and post immersion weight as compare to Dia Dent and Sure endo. When comparing Fluid Absorbed and Dry weight with the three groups, Dia Dent and Sure endo appears to have highest value (0.05) as compare to META (0.02)

Key Word: Paper point, DiaDent, META, SureEndo

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I. Introduction

Three-dimensional root filling, which is required to isolate the root canal system in endodontic therapy, is not possible if the extracted and prepared canal is not completely dry before obturation. As a result, drying the root canal area is a critical step in hermetic sealing because moisture affects the adhesion and physiochemical properties of filling materials.⁽¹⁾ Although many methods have been created over time, PAPER POINTS are widely utilized not only to dry the root canal region, but also to – 1. Carry intracanal medicament dressing into the canal (paste are impregnated and inserted into the root canal for slow drug delivery). 2. Haemostatic Application, the point is used with haemostatic agent for post pulpotomy wound management. 3. To transfer Bacteriological samples from the root canal to culture media. The primary function of the absorbent paper point is to dry the interior environment of the root canal. Because the interior space of the root canal is so small, it is hard to access it with ordinary equipment and view it with the eyes. This can be determined indirectly by repeatedly using the absorbed paper points and observing the colour change of the points to see if the canal is free of exudate and has dried out. Hence the present study aims to compare the absorbency properties of three different brands of standardized endodontic paper points available in the market.⁽²⁾

Method Of Drying The Root Canal Space –

1. PAPER POINTS - Easy to use and inexpensive. The porous honeycomb structure of absorbent paper points collects exudate, saliva, and rinse residues from canals through capillary action, thereby keeping the canal dry. The point is tough and resilient, adapts well to the canal environment, leaves no fibrous debris, is difficult to break, and ensures the canal's hygiene.

2. 95% ETHANOL – Less time consuming and economical. Resorbing roots, potential effect on developing tooth bud.

3. CANAL CLEAN – 70% isopropyl alcohol, acetone and water. 70% isopropyl alcohol improves adherence strength, interfacial ultrastructure, and tag penetration in sealers.
4. ENDO – ASPIRATOR SYSTEM – uses vacuum absorption technique compact and comfortable to use device.
5. LUER VACUUM ADAPTER – adapts to any chairside high volume evacuator unit to efficiently remove irrigants and debris.

LABORATORY TEST METHOD – 5 SECOND SINKING TEST - Paper point must sink completely within 5 second after being immersed in the selected liquid, and the length of the point must swell by < 3% after absorption.

II. Material And Methods

This prospective comparative study was carried out in the of Department of Conservative Dentistry and Endodontics at C.S.M.S' S Dental College and Hospital, Chatrapati Sambhajanagar, Maharashtra on March 2025. A total 15 samples were used in this study.

Study Design: Prospective Comparative study.

Study Location: Department of Conservative Dentistry and Endodontics at C.S.M.S'S Dental College and Hospital, Chatrapati Sambhajanagar, Maharashtra.

Sample size: 15 samples (5 form each group)

Sample size calculation: The sample size actually obtained for this study was 15. (Group I- DiaDent paper points, Group II- META paper points, Group III- Sure – Endo paper points, 5 for each group)

Procedure methodology

Standardized endodontic absorbent paper points, size 30, from three different brands were used for the study. {DiaDent, META, and Sure-Endo} Five absorbent paper points from each brand were selected from packages with assorted points. A total of 15 points were tested. Each dry paper point was weighted using an electronic weighing balance. A length of 16 mm from the tip was then lowered in the distilled water for 5 seconds. The paper point was weighted again, and the difference between both the measurements was taken as a value of fluid absorbed.



FIGURE 1 Paper Points

III. Result

TABLE 1 Comparison between Fluid Absorbed, Dry Weight and Post Immersion weight between the groups.

Group	Paper Points	Mean	SD	CV	P Value
Fluid Absorbed	DIA DENT	0.05	0.02	40%	0.012
	META	0.02	0.02	100%	
	SURE ENDO	0.05	0.02	40%	
Dry Weight	DIA DENT	0.06	0.01	17%	0.001
	META	0.05	0	0%	
	SURE ENDO	0.06	0.01	17%	
Post Immersion Weight	DIA DENT	0.11	0.01	9%	0.000
	META	0.06	0.02	33%	
	SURE ENDO	0.1	0.01	10%	

TABLE 2 Pairwise comparison of Fluid Absorbed among paper points. (Tuckey Test)

Group I	Group J	Mean Difference (I - J)	P Value
DIA DENT	META	0.03	0.022
	SURE ENDO	0	1
META	DIA DENT	-0.03	0.022
	SURE ENDO	-0.03	0.022
SURE ENDO	DIA DENT	0	1
	META	0.03	0.022

TABLE 3 Correlation between Dry weight and Fluid Absorbed

Paper	r	P value
DIA DENT	0.281	0.311
META	-0.662	0.233
SURE ENDO	-0.147	0.813

DiaDent and Sure-Endo shows the higher Fluid absorbency and Dry weight than META. The Post Immersion weight for the DiaDent appears to be slight increased than Sure-Endo. Meta shows least rate for post immersion, fluid absorbed and dry weight as compare to other two groups.

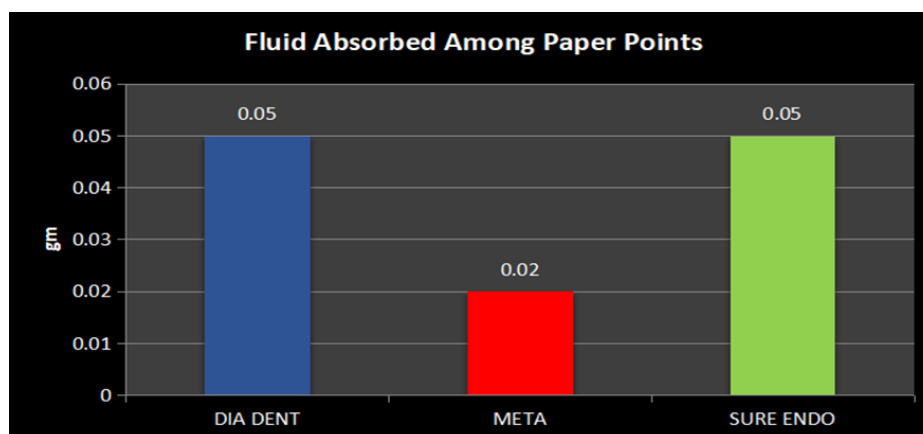


FIGURE 2 Fluid Absorbed

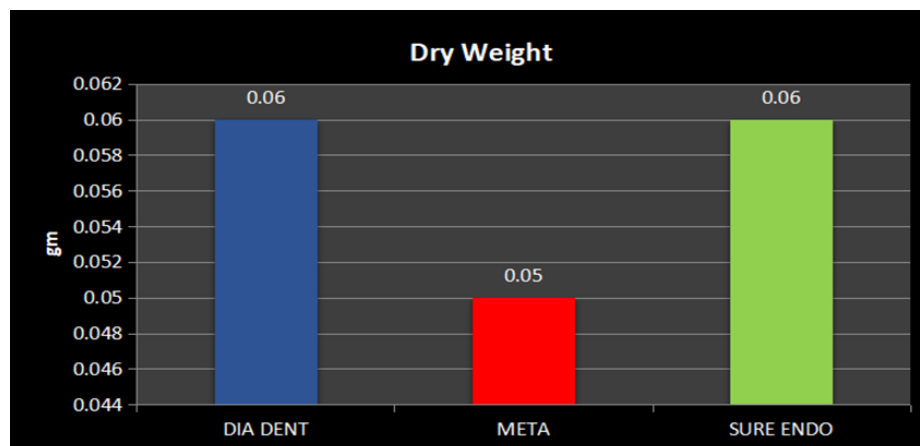


FIGURE 3 Dry Weight

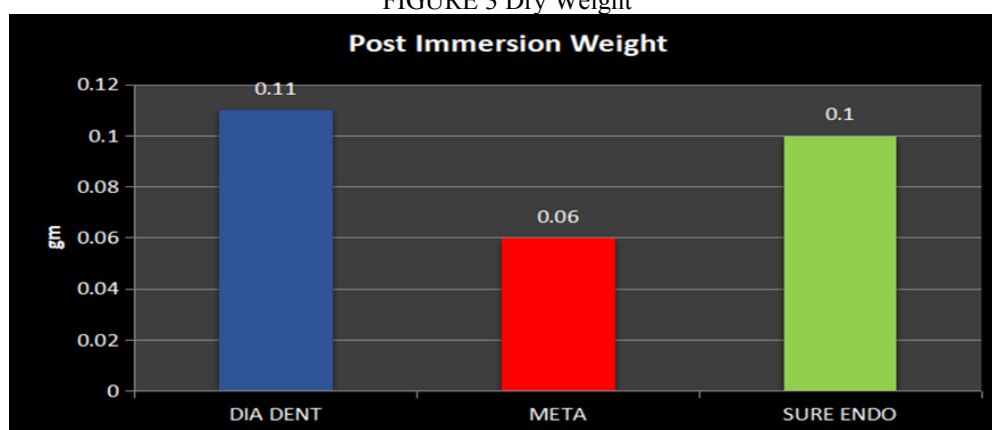


FIGURE 4 Post Immersion Weight

IV. Discussion

Drying the root canal space is critical for achieving a three-dimensional hermetic seal, which improves the adhesive and physiochemical properties of the root canal filling materials. An essential requirement for isolating the root canal system in endodontic therapy is the dryness of the extirpated and prepared canal prior to obturation. Although there are several methods for drying the root canal space, absorbent paper points are less expensive and easier to employ for the majority of practitioners.⁽³⁻⁴⁾

Among the three different brands used the study, DIADENT had a considerably higher absorbency of standardized paper point than the other two brands.

The study used distilled water to immerse the absorbent paper point, but the drawback is that it does not match the viscosity value of the accessible oral fluids in the root canal space.

V. Conclusion

The results are obtained by comparing the Fluid absorbed, Dry weight and Post immersion weight between the three groups. According to the results of this study, META shows the lowest value for fluid absorbed, dry weight and post immersion weight as compare to Dia Dent and Sure endo. When comparing Fluid Absorbed and Dry weight with the three groups, Dia Dent and Sure endo appears to have highest value (0.05) as compare to META (0.02).

Post Immersion Weight for the Dia Dent exhibits higher value (0.11) as compare to Sure endo (0.1) and META (0.06). The most crucial stage in root canal treatment is to completely dry the internal environment of the canal in order to achieve a complete hermetic seal. Paper points are the cheapest and most traditional technique of drying a root canal, and numerous kinds are available on the market with varying rates of absorption.

In this study, it has been concluded that Dia Dent and Sure endo being the most reliable as compare to META.

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