



## Comparative Study of Acid Value of Root Canal Lubricant: Self Developed vs. Commercially Available

Rajendra Kankariya<sup>1\*</sup>, Satish D. Ingale<sup>2</sup>, Deepak Shah<sup>3</sup>

<sup>1</sup>D. G. Tatkare Arts and Commerce College, Tala, Raigad, India.

<sup>2</sup>Department of Chemistry, Y. M. College of Arts, Science and Commerce, Bharati Vidhyapeeth Deemed University, Pune, India.

<sup>3</sup>Kamala Education Society, Chinchwad, Pune, India.

\*Corresponding author's E-mail: [rdkankariya@rediffmail.com](mailto:rdkankariya@rediffmail.com)

Accepted on: 04-07-2013; Finalized on: 31-07-2013.

### ABSTRACT

Self developed and commercially available root canal Lubricant was tested for acid value. The major objective of this study is to observe influence of acid value on the performance of root canal lubricant or any other side effect during root canal treatment. Acid value determination were performed for self developed root canal lubricant gel having various concentrations such as 10%, 24%, 31%. Comparative study of acid value was also studied between self developed root canal lubricant such as 17% and commercially available root canal lubricant gel such as File – Rite, Prep - rite and RC Help. It was observed that self developed as well as File – Rite root canal lubricant gel has acid value nil. However, Prep – Rite and RC Help has higher acid value.

**Keywords:** Acid Value, Root Canal Lubricant, Root Canal Treatment.

### INTRODUCTION

Idea of acid value determination was taken from determination of surface tension of root canal lubricant<sup>1-2</sup>. Root canal lubricants are used to remove the smear layer during root canal preparation<sup>3-4</sup>. Acid Value is also designated as acid number or acidity or neutralization number. Acid Value is expressed in terms of potassium hydroxide<sup>5-6</sup>. Acid value of root canal lubricant is defined as the number of milligrams of potassium hydroxide necessary to neutralize the free acid present in one gram of the sample. Acid Value was determined by titrating known weight of root canal lubricant sample against 0.1 N KOH. Acid value helps in determination of the amount of free acid present in the root canal lubricant. Determination of acid value is carried out in water as a solvent and involves acid – base titration. Larger the value of acid value indicates that higher is the amount of free acid present in the root canal lubricant. On the contrary, smaller the value of acid value indicates that amount of free acid present in the root canal lubricant was found to be very less.

### MATERIALS AND METHODS

#### Materials

All the chemicals necessary for the determination of acid value are purchased from Earth Chemicals, Mumbai made up of Merck Chemicals Pvt. Ltd. Special chelating agent and viscosity modifier are used for the preparation of root canal lubricant gel. File – Rite, Prep - rite and RC Help were purchased from Pulp Dent Corporation and Prime dental company, Mumbai respectively.

#### Methods

Weighed accurately 2g sample of RCL – 10 i.e. self developed root canal lubricant and dissolved in 30 ml

distilled water. In that, 2-3 drops of phenolphthalein indicator was added. The solution was titrated against 0.1 N KOH. The end point is reached when permanent pink colour persists for at least 30s. Therefore end point of titration is from colourless to pink. Acid value of root canal lubricant was then calculated using the formula:

$$\text{Acid Value} = \frac{56.1 \times B. R. \times \text{Normality of KOH}}{\text{Weight of root canal lubricant}}$$

The similar procedure can be used for RCL- 17, RCL- 24, RCL – 31 and commercially available lubricant such as File – Rite, Prep – Rite and RC Help. The result obtained for all the above root canal lubricant samples are as mentioned in the table 1-2 and as shown in fig.1.

### RESULTS AND DISCUSSION

The results indicates that self developed root canal lubricant gel having various concentration such as 10%, 17%, 24% & 31% etc. has zero or nil acid value. On the contrary 17% File – Rite also have zero or nil acid value. 17% Prep – Rite and RC – Help has acid value 38 and 40 respectively and this is because of presence of urea peroxide.

**Table 1:** Acid Value of Self Developed 10%, 24% and 31% Root Canal Lubricant

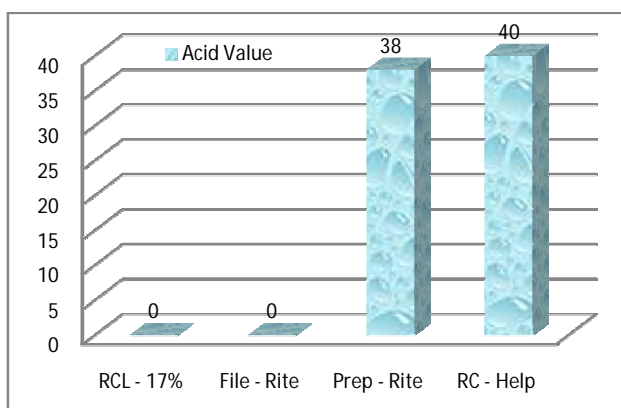
Description	Acid Value
*RCL – 10	0
RCL – 24	0
RCL - 31	0

\*RCL - Root Canal Lubricant

**Table 2:** Comparative Study of Acid Value of 17% Root Canal Lubricant: Self Developed Vs. Commercially available

Description	Acid Value
*RCL – 17%	0
File - Rite	0
Prep - Rite	37
RC - Help	40

\*RCL - Root Canal Lubricant

**Figure 1:** Graphical representation of comparative Study of Acid Value of 17% Root Canal Lubricant: Self developed Vs. Commercially available**CONCLUSION**

The sample of root canal lubricants having zero or nil acid value maintain neutral environment in the root canal

during root canal treatment and does not cause any side effects and also avoids corrosion of Ni-Ti files. On the contrary, Prep-Rite & RC- Help shows higher acid value and creates acidic environment in the root canal during root canal treatment and causes corrosion of Ni-Ti files as well as side effects on the root canal.

**Acknowledgement:** The authors would like to thank the Visual Junnar Seva Mandal's Institute of Pharmacy, Ale, Junnar, Pune and Maharashtra, India for providing laboratory facility to carry out an analytical work.

**REFERENCES**

- Giardino L, Ambu E, Becce C, Rimondini L, Morra M, Surface tension comparison of four common root canal irrigants and two new irrigants containing antibiotic, *JOE*, 32 (11), 2006, 1091-93.
- Taşman F, Çehreli ZC, Ogan C, Etikan I, Surface tension of root canal irrigants, *J Endod*, 26, 2000, 586 – 87.
- Torabinejad M, Khademi AA, Babagoli J, A new solution for the removal of the smear layer, *J Endod*, 29, 2003, 170 –5.
- Ingale SD, Kankariya RD, Formulation of 17% Root Canal Lubricant Gel suitable for Indian Economy, *IJAPR*, 04(06), 2013, 1887-1890.
- Elena K, Yakov IT, Acid Value determination in vegetable oils by indirect titration in aqueous – alcohol Media, *Croat. Chem. Acta*, 78(1), 2005, 99 – 103.
- Khan SH, Bhatti BM, Sardar R, Acid Value of Vegetable oils and poultry feed as affected by storage period and antioxidants. *Pakistan Vet. J*, 21(4), 2001, 194-195.

Source of Support: Nil, Conflict of Interest: None.