EFFECT OF SODIUM HYPOCHLORITE ON THE PUSH-OUT BOND STRENGTH OF BIODENTINE AND ENDOSEQUENCE BIOCERAMIC ROOT REPAIR MATERIAL ON FURCAL PERFORATION – AN IN VITRO STUDY.

ABSTRACT:
AIM:
To evaluate the effect of sodium hypochlorite on the push-out bond strength of Biodentine (BD) in comparison with Endosequence root repair material (ERRM) on furcal perforation.

MATERIALS AND METHOD:
Furcal perforation repair of 120 specimens were made, out of which 60 samples were repaired with biodentine and the remaining 60 samples were repaired using endosequence root repair material. The test materials were incrementally placed into the prepared furcal space of the dentin slices and condensed gently. Excess material was trimmed from the surface of the samples with a scalpel.

Subsequently, the samples were wrapped in wet gauze, placed in an incubator, and allowed to set for 10 minutes at 37°C with 100% humidity. Immediately after incubation, the samples were divided into 6 subgroups, each subgroup contained 20 samples each. Subgroup IA (n = 20) - perforation area was repaired with biodentine and immersed into 3.5% NaOCl (VIP Vensons, India). Subgroup IB (n = 20) - perforation area was repaired with biodentine and immersed in saline solution (Nirlife NIRMA LIMITED). Subgroup IC (n = 20) - perforation area was repaired with biodentine. No irrigation was performed in the controls. Subgroup II A (n = 20) - perforation area was repaired with ERRM and immersed into 3.5% NaOCl (VIP Vensons, India). Subgroup II B (n = 20) - perforation area was repaired with ERRM and immersed in saline solution (Nirlife NIRMA LIMITED). Subgroup II C (n = 20) - perforation area was repaired with ERRM. No irrigation was performed in the controls.
After 30 minutes of immersion in the respective test solutions, all samples were removed and washed with distilled water. Then all the specimens were allowed to set for 48 hours at $37^0\text{C}$ with 100% humidity using an incubator. In the control group, a wet cotton pellet was placed over each specimen and restored with root repair material without any irrigation. Then its allowed to set for 48 hours. After which all the samples were subjected to push-out bond strength analysis using universal testing machine. The resistance against dislodgement forces are recorded using real software. Then, nature of bond failure examined under stereomicroscope at X40 magnification. Finally, randomly, selected samples from each group were analyzed for morphological characteristic changes.

RESULT:

Sodium hypochlorite had significantly improved the bond strength of bioceramic root repair material with a mean value of (19.2 and 18.7) for ERRM and Biodentine respectively. The samples in the control group showed significantly lower bond strength on over all comparison with a mean value of (8.4 and 12.8) for ERRM and Biodentine respectively.

CONCLUSION: Within the limitations of this study it was observed that,

- NaOCl had a positive influence on the bond strength of bioceramic root repair materials.
- The biodentine had a negative influence on exposure to saline.
- The moisture present in the dentinal tubules was not adequate for the setting reaction of ERRM. The material started to set only when completely covered by water. Thus, additional moisture is required for the setting reaction of ERRM.
- The setting time of ERRM was not 4 hours as per the manufacturers instruction especially in a dry environment.
- None of the samples in this study had undergone an adhesive mode of failure.
- Majority of the samples predominantly showed a cohesive mode of failure. However, the control group showed a mixed mode of failure.
KEY WORDS:
ERRM, Biodentine, NaOCl, Push-out bond strength, Nature of bond failure, morphological characteristics.