

ABSTRACT

AIM :

The present in vitro study evaluated and compared the degree of coronal tooth discoloration after using various calcium silicate based cement in the presence or absence of blood using spectrophotometer

OBJECTIVES:

Objectives of the present study where as follows :-

1. To compare the degree of tooth discoloration associated with calcium silicate based barrier materials used in vital pulp therapy.
2. To compare the tooth discoloration in the presence and absence of blood.
3. To compare the degree of discoloration on the composite material in the presence and absence of blood.
4. To compare the degree of tooth discoloration following placement of the 3 barrier materials and composite resin in the presence and absence of blood.
5. To compare and assess the color change for the 3 different material used in the study at 3 different time intervals
 - After completion of 24 hours.
 - After 30 days or 1 month.
 - After 180 days or 6 month.

6. To compare the following parameters of color using numerical value.
 - ΔL^* (change in translucency)
 - Δa^* (change in green/red channel)
 - Δb^* (change in blue/yellow channel)
 - ΔE^* (change in tooth discoloration)
7. To statistically analyse the changes in color parameters due to the presence and absence of blood contamination due to the components of 3 different materials tested with the 2 control groups.
8. To statistically analyse the changes in the parameters of color in the presence and absence of blood for the 3 tested materials and 2 controls at 3 different time periods (24 hours, 1 month and 6 months)
9. To compare and discuss the behavior of the tested barrier materials in the presence and absence of blood and reason out the probable cause for the discoloration due to blood contamination during vital pulp therapy.

METHODOLOGY:

Sixty six maxillary anterior teeth were prepared and 60 samples are randomly divided into 2 groups(group 1:saline and group 2: blood). Each group was further subdivided into 3 groups (n=10) of wProroot MTA(wPMTA), Biodentin (BD) and Endosequence root repair material(ERRM) which filled the pulp chamber as cemental barrier materials.

The remaining six teeth served as control (n=3) for saline and blood group. Color measurements was done at 3 time period (after 24 hours, 1 month and 6 month) after application of material. Color measurements are done by spectrophotometer using CIELAB system. Repeated measures ANOVA was used to evaluate change in color with materials used at different time periods.

RESULTS:

Discoloration of teeth occurred to some degree in all the group including control group after the application of these cements. But the specimens filled by the these materials in the presence of blood in the pulp chamber showed significantly more discoloration than the saline group.

CONCLUSION:

The present study showed significant decrease in translucency and increase in discoloration on placing the three different cemental barrier material in the presence of blood. In the absence of blood Biodentin exhibited least discoloration than white Proroot MTA and Endosequence root repair material. The coloring pigments present in the erythrocytes of blood have a role in causing discoloration of teeth following haemorrhage of the pulpal blood vessels and these components interact with the different cemental barrier materials.

Keywords : white Proroot MTA, CIELAB system, Endosequence root repair material, Biodentin