



## CLINICAL EVALUATION OF TWO DIFFERENT MATERIALS FOR RETROGRADE ROOT FILLING

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**INTRODUCTION:** Retrograde root filling is indicated when periapical inflammation cannot be resolved by conventional endodontic therapy. A retrograde filling should prevent flow of microorganisms and bacterial endotoxins from the root canal into periapical tissues. A material that is considered for retrograde root filling must be:

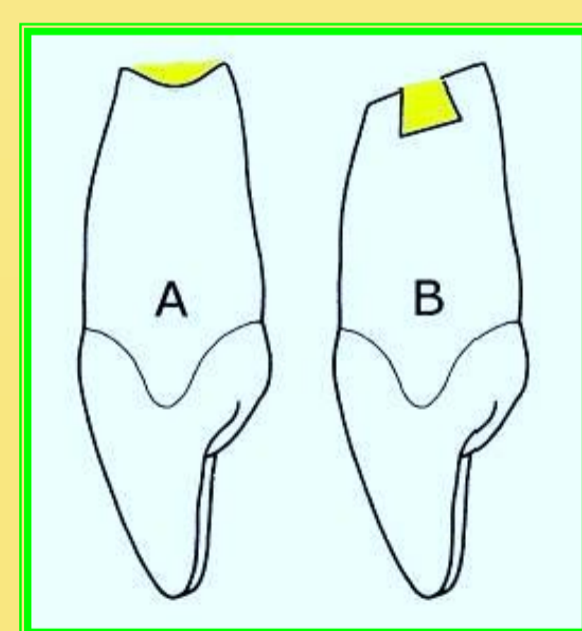
- biocompatible and insoluble in the periapical environment and should provide a tight apical seal,
- clearly visible on radiographs,
- easy to handle in a surgical field, and
- not be technique sensitive.

A resin composite used in combination with a dentin - bonding agent and a glass cement both have the property of sealing by chemical bonding dentin. Both materials, however, also contract during polymerization, which results in marginal gap formation if the materials are applied in cavities. For bonded resin composite it is advocated to prepare the resection surface slightly concave instead of conventional apical cavity to avoid the problem of marginal gap formation. In addition, this technique makes it possible to seal apical anatomies, the apical delta, exposed dentinal tubules, and accessory root canals on the resection surface. Glass ionomer cement is known to be less sensitive to moisture during application, which might lead to better clinical results than with retroplast when hemostasis is difficult to achieve intraoperative. Dentin-bonded resin nano composite (NC) Filtek Supreme XT and glass ionomer cement (GJC) Photac Fill Quick were chosen for the present study.

**AIM:** The aim was to estimate the of clinical and radiographic treatment outcome of retrograde root filling materials using special preparation performance of resection surface.

**MATERIAL and METHOD:** Apicectomies of an incisors and canines of 20 patients with indication of retrograde root filling was made. The entire resection surface was slightly concave prepared. A total of 20 slightly concave root sections were divided in to two groups of 10 patients and filled with either root filling materials. This preparation technique prevents marginal contraction gaps during polymerization and makes a sealing of the entire resection surface possible. Controls were made after 1, 3, 6 and 12 months.

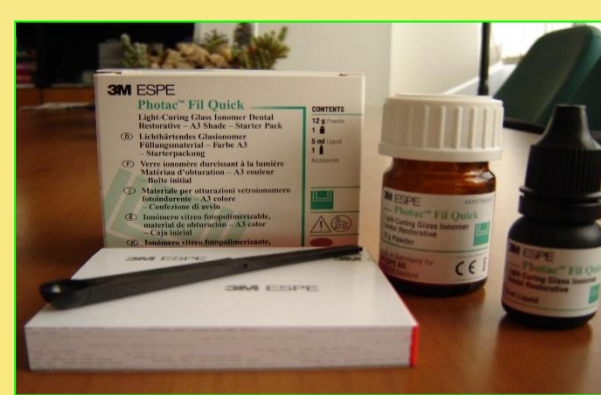
**RESULTS:** The last control made after 12 months shows that the proportion of successful cases was significantly higher in the first group with dentin-bonded resin nano composite group (64%) than in the second glass ionomer group (42%,  $p < 0.001$ ). The reason for failure in the second group was loosening of the retrograde filling.



Root - end resected teeth:  
A - resection surface slightly concave  
B - conventional apical cavity preparation



Filtek Supreme XT  
Dentin-bonded resin nano composite Filtek Supreme XT and glass ionomer cement Photac Fill Quick were chosen for the present study, applied onto the entire, slightly concave resection surface.



Photac Fill Quick



Root- end resection and Retrograde root filling with Filtek Supreme XT. (the resection surface has been prepared slightly concave using a ball shaped diamond-burr)



Radiograph 1 year after retrograde root filling showing complete healing with reformation of the periodontal ligament space and lamina dura)



Retrograde root filling of 21 with Photac Fill Quick (a conventional apical cavity is prepared in the upper left lateral incisor)

| Preoperative general status                         |                |               |           |
|---|----------------|---------------|-----------|
|   | nano composite | glass ionomer | total     |
| No. of apicotomized teeth                           | 10             | 10            | 20        |
| Age (years +/- SD)                                  | 48 ± 13        | 42 ± 8        | 45 ± 10.5 |
| Sex: M/F  | 2.1/1          | 1.6/1         | 1.8/1     |
| Alcohol daily (%)                                   | 28             | 22            | 25        |
| Smokers (%)   | 52             | 44            | 48        |
| Subjective symptoms (%)                             | 63             | 51            | 57        |
| Intraoperative data and histopathological diagnosis |                |               |           |
| Duration of surgery (min +/- SD)                    | 73 ± 20        | 73 ± 25       | 73 ± 23   |
| Angulation of resection surface (° +/- SD)          | 37 ± 8         | 34 ± 10       | 35 ± 9    |
| Radicular cyst                                      | 2              | 1             | 3         |
| Granuloma   | 4              | 6             | 10        |
| No evaluation                                       | 4              | 3             | 7         |
| Excluded cases and final material after follow - up |                |               |           |
| Based material                                      | 10             | 10            | 20        |
| Successful: complete healing                        | 7 (70)         | 6 (60)        | 13 (65)   |
| Doubtful: uncertain healing                         | 2 (20)         | 3 (30)        | 5 (25)    |
| Failure: -root fracture (%)                         | 1 (10)         | 1 (10)        | 2 (10)    |
| Final material                                      | 9              | 9             | 18        |
| No evaluation                                       | /              | /             | /         |

**CONCLUSION:** Due to insufficient bonding strength to the concave resection surface, retrograde root filling with glass ionomer results in an unacceptably high failure rate. Dentin-bonded resin nano composite applied onto the entire, slightly concave resection surface is a feature apical filling material characterized by a high success rate.