Adhesive Ability of Different Oral Pathogens to Various Dental Materials: An in Vitro Study

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Abstract

This study provides a basis for selecting dental materials and lays a foundation for developing new dental materials. Four dental restorative materials were divided into two groups: *Streptococcus mutans* and *Actinomyces viscosus*, five root canal sealing materials were divided into two groups: *Porphyromonas gingivalis* and *Enterococcus faecalis*. Each material block was immersed in the corresponding group of the bacterial solution and cultured under anaerobic conditions at 37°C for 2, 4, 6, 8, 12, 16, 20, and 24 h. The adhesion of bacteria was observed, the number of different bacteria adhering to various material model disks was calculated at different time intervals under a scanning electron microscope. 24 hours later, the number of *Streptococcus mutans* and *Actinomyces viscosus* that adhered to the surface of the resin and the zinc phosphate cement material disks was the maximum. The number of *Porphyromonas gingivalis* and *Enterococcus faecalis* adhering to the surface of the AH Plus sealer block was the maximum. *Streptococcus mutans* and *Actinomyces viscosus* exhibited the strongest adhesion ability to the resin and the zinc phosphate cement material block. *Porphyromonas gingivalis* and *Enterococcus faecalis* showed the highest adhesion ability to the AH Plus sealer block.

Full-text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

Group: 1. 3M Z350 resin, 2. glass ionomer cement, 3. zinc phosphate cement, 4. Icon;
(Bacteria count unit: number/ $\times$ 5000 visual field; Time unit: hour)

Figure 1

Streptococcus mutans group

Figure 2

Electron microscopy pictures of *Streptococcus mutans* group

Group: 1. 3M Z350 resin, 2. glass ionomer cement, 3. zinc phosphate cement, 4. Icon;
 (Bacteria count unit: number/ $\times$ 5000 visual field; Time unit: hour)

Figure 3

Actinomyces viscosus group

Figure 4

Electron microscopy pictures of *Actinomyces viscosus* group

Group: 5. MTA, 6. AH-Plus, 7. iRoot-SP, 8. iRoot-BP, 9. iRoot-FS;
 (Bacteria count unit: number/ $\times$ 5000 visual field; Time unit: hour)

Figure 5

Porphyromonas gingivalis group

Figure 6

Electron microscopy pictures of *Porphyromonas gingivalis* group

Group: 5. MTA, 6. AH-Plus, 7. iRoot-SP, 8. iRoot-BP, 9. iRoot-FS;
 (Bacteria count unit: number/ $\times$ 5000 visual field; Time unit: hour)

Figure 7

Enterococcus faecalis group

Figure 8

Electron microscopy pictures of *Enterococcus faecalis* group

Supplementary Files

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