Class I inlay cavities were prepared on human molars \((n = 60)\). Teeth were divided into six groups \((n = 10)\). In the first group \((ST-C)\), Structur 2SC (ST) was used with a provisional luting agent, and in the second group \((SY-C)\), Systemp Inlay (SY) was directly applied and light-polymerized. In the remaining four groups, cavities in the third \((SB-ST)\) and fourth \((OS-ST)\) groups were, respectively, pretreated with the bonding agents, Single Bond (SB) and One Step Plus (OS), and the fifth \((SB-SY)\) and sixth \((OS-SY)\) groups were pretreated with the same bonding agents. The third and fourth groups were then restored with ST and the fifth and sixth groups with SY. The teeth were subjected to thermal cycling and immersed in a 0.5% basic fuchsin solution for 24 hours. Specimens were sectioned and examined for leakage. Data were analyzed using the Kruskal–Wallis and Mann–Whitney \(U\) tests \((P < 0.01)\). The interface between the provisional material and dentin was observed using a scanning electron microscope (SEM).

Results

Groups treated with a bonding agent \((SB-SY\) and \(OS-SY)\) before placement of the light-polymerized provisional material had significantly less microleakage \((P < 0.01)\). No statistical differences were found between leakage scores of the remaining groups. The \(OS-SY\) group displayed the best cavity wall-inlay adaptation under SEM.

Conclusion

The microleakage in class I inlay cavities could be reduced by the application of dentin-bonding agents after cavity preparation followed by the placement of light-polymerized provisional restorative materials.

Keywords

inlay; microleakage; scanning electron microscope