Introduction:
High strength of modern provisional materials is important for extending the time for clinical application. It was the aim of this study to determine fracture resistance and fracture toughness of different provisional restorative materials including an experimental material.

Materials and Methods:
The in-vitro study fracture strength of three-unit bridges of provisional crown & bridge materials was determined. Identical alloy dies (Biosil F, DeguDent, G) were fixed in resin at a distance of 10 mm simulating a posterior gap. An artificial periodontium was provided with polyether impression material (Impregum, 3M ESPE, USA). All bridges were bonded with RelyX Temp NE (3M ESPE, USA). Ten samples of each group were stored in aqua dist. for 14 days and subsequently submitted to thermal-cycling and mechanical-loading (TCML: 50 N, 480000 loadings; 1200x5° /55° C). Occlusal wear was determined with 3D scanning. Ten samples of each material were stored for 24 hrs in aqua dist. as a control. All specimens were loaded to fracture (Zwick, G; v=1mm/min). Fracture patterns were determined optically. Independently fracture toughness K1c was determined (n=10). Medians and 25%/75% were calculated.

Results:
Conclusion:
The tested materials loose about 11-19% of their fracture strength due to TCML. One material even failed completely during aging. Among the surviving materials experimental Protemp showed the highest fracture resistance after TCML as well as highest fracture toughness and may be therefore considered for long-term temporization.