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Fracture resistance of CAD/CAM posterior crown restorations made with three different materials

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The purpose of this study is to compare the fracture resistance of zirconia monolithic full porcelain crowns, resin nano ceramic crowns and veneered crowns with zirconia cores. Around 90 human mandibular molars were extracted and mounted onto acrylic resin. Prior to preparations, impressions were taken. Stone models were prepared and divided into three groups. The cores of Lava zirconia full ceramic crowns (Group 1), full contour of Lava monolithic zirconia crowns (Group 2) and full contour of Lava Ultimate resin nano ceramic crowns (Group 3) were designed on 3M ESPE Lava design software program. Data were used in 3M ESPE Lava CNC 240 computer aided manufacturing device for production of restorations. The zirconia cores of group 1 were veneered with feldspathic porcelain. Crown restorations were cemented with adhesive resin cement. All specimens were subjected to compressive loading in a universal testing machine. The mean failure loads obtained from ceramic crowns with zirconia cores, monolithic zirconia crowns and resin nano ceramic crowns were between 4298,13 N and 2695,53 N. The highest failure load (5099,84 N) was obtained from monolithic zirconia crown specimen. The lowest failure load (730,625 N) was obtained from resin nano ceramic crown specimen. There was statistical significance between three groups. Lava Ultimate restorations showed the lowest fracture strength values. Lava monolithic restorations showed the highest fracture strength values. The mean fracture strength of all groups was higher than masticating forces.

Biography

Ceren Küçük has completed his PhD from Marmara University and currently working as Assistant Professor at the Faculty of Dentistry Marmara University since 2015.

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