Ministry of Higher Education
& Scientific Research
University of Baghdad
College of Dentistry

Evaluating the internal and marginal fitness of zirconia substructure when used as single crown restoration or retainer for three unit fixed partial denture (comparative study) (An In vitro study)

A thesis
Submitted to the Council of the College of Dentistry at the University of Baghdad in partial fulfillment of the requirements for the Degree of Master of Science in Conservative Dentistry.

By
Auday Mohammed Al- Asady
B.D.S.

Supervised by:
Prof. Dr. Haitham Jassim Al-Azzawi
B.D.S., M.Sc. (USA)

201٦ A.D. 143٧ A.H.

Abstract

The marginal gap and internal fitness of the restoration are important factors for its longevity. The aim of this in vitro study was to compare the marginal gap and internal fitness between single core and cores within three-units bridge of zirconium fabricated by CAD-CAM system.

Ideal model o full dental arch from Ivoclar Company used as a pattern to simulate three- units bridge with (maxillary first molar and maxillary first premoler) as abutments used to fabricate stone models. The stone models divided into three groups: eight single crowns of molar, eight single crowns for premoler and eight of three-unit bridges, the crowns and bridges fabricated by CAD-CAM system and then cemented on their respective stone models then sectioned at the mid-point buccolingaully and misiodistaly then examined under stereomicroscope.

The result of the study showed the marginal gap in both the crown and bridge within the acceptable value 120µm, one –way ANOVA test showed that there was significant differences in the internal gap among the areas, range between (30-70.5) µm in marginal area,(28-97)µm in chamfer area, (28-55)µm in axial wall , (80- 120.5)µm in cusp tip and from (70-155) µm in occlusal area. Independent t- test showed there was a significant difference between the crowns and bridges in concern marginal and internal fitness.

The conclusions were the marginal gap and internal fitness in the bridge higher than those in the crowns, the areas of sloped surfaces such as chamfer area, occlusal area and cusp tip had high gap values in compare with area of flat surface such as axial wall and when the surface area of abutment increased , the marginal and internal gaps would increase.