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

# Marginal fitness of CAD/CAM all ceramic crowns constructed by direct and indirect digital impression techniques (An In vitro-Study)

A thesis

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# Abstract

The most important factor that determines the success and longevity of indirect restorations is marginal accuracy, which is absolutely affected by the final impression. The objective of this present *in vitro* study was to evaluate the marginal fitness of all ceramic crowns fabricated by direct (Bluecam camera and Omnicam camera) and indirect (inEos bluecam camera) digital impression technique.

Sixteen sound recently extracted upper first premolar teeth of comparable size were collected. Standardized preparation of all teeth samples were carried out to receive all ceramic crown restoration with deep chamfer finishing line(1mm), axial length (4mm) and convergence angle 6 degree). All teeth were duplicated to have sixteen dies, and the resultant thirty two specimens divided in to four groups according to the type of digital technique: Group A1 , eight prepared teeth scanned directly by Bluecam camera; Group A2 their respective dies scanned by inEosbluecam camera ; Group B1 , eight prepared teeth scanned directly by Omnicam camera ; Group B2, their respective dies scanned by inEosbluecam camera. Then CAD/CAM all ceramic crowns were constructed for each tooth sample and its respective die.

Marginal discrepancy was measured at four points at each tooth surface. Sixteen points per tooth were thus measured using a digital microscope at (120X) magnification.

The results of the present study showed that for the direct digitalization technique the highest marginal gap was (36.688µm) for group A1 and the least marginal gap was (34.892µm) for group B1, while the marginal gap for the indirect digitalization technique (group A2 and group B2) were 76.105µm and 80.783µm, respectively. One-way ANOVA test revealed a statistically highly significant difference among groups. LSD test

showed that the Omnicam camera provided more marginal accuracy than the Bluecam camera but the difference was not significant statistically. LSD test revealed that the direct digital technique was more accurate than indirect digital technique.

As a conclusion, the Omnicam camera has the same accuracy of the Bluecam camera. In addition, direct digital technique is more accurate than indirect digital technique regarding marginal adaptation.