

**Cobalt Chromium versus Zirconia
frameworks on stresses induced in
implants supporting structures using
ALL-ON-4[®] protocol
(Strain Gauges Analysis)**

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By
Yomna Mamdouh Mohamed

B.D.S. 2006

Faculty of Dentistry
Ain-Shams University

Faculty of Dentistry
Ain-Shams University
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Supervisors

Professor Dr. Rami Maher Ghali

Professor of Prosthodontics,
Vice Dean of Community Service and Environmental
Development,
Faculty of Dentistry, Ain-Shams University

Dr. Mahmoud El Moutassim Salah-Eldin El Homossany

Lecturer of Prosthodontics,
Faculty of Dentistry, Ain-Shams University

Dr. Shaimaa Lotfy Mohamed

Lecturer of Prosthodontics,
Faculty of Dentistry, Ain-Shams University

To who makes my dreams comes true

My Great family to whom I owe a lot

My Dear mum, father & sister

My beloved husband

And my lovely daughters

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Introduction

Edentulism is the terminal outcome of a multifactorial process including biological processes such as caries, periodontal diseases, pulpal pathology, trauma, oral cancer as well as non-biologic factors related to dental procedures.

It is conservatively assumed that ten percent of the world's population of 6 billion is between partially or totally edentulous. The choice between a fixed prosthesis and an overdenture when treating the edentulous maxilla with implants shows wide variation both within and between countries.

A wide variety of treatment modalities exist for the edentulous patient. The preferable design for the edentulous patient was the fixed implant-supported prostheses. Many patients prefer this design as it provides them with a "natural feel" which they find comparable to their own teeth regarding both esthetics and function.

The All-on-4® protocol as set forth by for immediately rehabilitating the edentulous maxilla was used for fully edentulous patients as well as being applied to partially dentate patients who preferred a fixed alternative to an interim removable denture during implant healing. ⁽¹⁾

Three-dimensional (3D) digital models obtained from intraoral scanners (IOS) can be used as an alternative to conventional casts. They can be stored easily, require little storage space and can be transmitted digitally.

Rapid prototyping (RP) is a suitable manufacturing method for structures with a high geometric complexity and heavily undercut features, which cannot be fabricated easily with traditional manufacturing methods. RP techniques, such as fused deposition modeling (FDM) three-dimensional printing (3DP).⁽²⁾

CAD/CAM systems have enabled the fabrication of frameworks from solid blocks of Ti, Co-Cr, and Zirconia.

So this study was conducted to answer the question which material will transfer less stresses to implant supporting structure Co-Cr or Zirconia?

Review of Literature

Edentulism

Edentulism is a term defined as the loss of all permanent teeth and is the outcome of a multifactorial process involving biologic process (dental caries, periodontal disease, trauma and others) as well as non-biologic factors related to dental procedures (access to care, patient preferences). ⁽³⁾

The complete edentulism distribution and prevalence between developed and less developed countries may be associated with a complex interrelationship between cultural, individual and socioeconomic factors and health. World health organization databanks indicate that dental caries is prevalent in the majority of countries internationally with some reporting 100% incidence in their populations, severe periodontal disease is estimated to affect 5–20% of the population and the incidence of complete edentulism has been estimated between 7% and 69% internationally. ⁽⁴⁾

Edentulism results from poor public health that substantially affects oral and general health status, as well as quality of life. It is an important but often-overlooked public health issue, especially for the elderly. Oral health