



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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The Effect of Different Scanning Protocols on the Retention of Digitally Constructed Complete Denture Bases

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي
أَنْعَمْتَ عَلَيَّ وَعَلَىٰ وَالِدَيَّ وَأَنْ أَعْمَلَ
صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي
عِبَادِكَ الصَّالِحِينَ

صدق الله العظيم

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INTRODUCTION

For more than 400 years' complete dentures were constructed by using different types of materials during the laboratory and clinical procedures. However, the complexity of the laboratory and chair side procedures and the drawbacks of the materials used made the computer technology more demanded in removable prosthodontics. ⁽¹⁾

Complete dentures can be constructed using different techniques. The determinant factor for choosing the most efficient technique is the resulting intimate mucosal adaptation of the prosthesis with minimal dimensional changes and distortion during fabrication. Good adaptation will result in good stability, support and retention. ⁽²⁾

The digital complete denture workflow is done by computer aided design and computer-aided manufacturing (CAD/CAM). It was successfully used over the last decades. It presents several advantages to the patient and the clinician. Normally, conventional complete dentures require five appointments with a lot of material waste and many hours of patient's, clinician and technician time. Digital workflow can be done in two appointments saving time, effort and material. In addition, patients' records are digitized and stored on the software for any future need. ⁽³⁾ The patient can have an identical prosthesis in case of fracture or lose without the need to make new records. This process will allow the clinician and technician to use a high-value, quality-controlled materials. ⁽⁴⁾

The preliminary step of the digital workflow is data acquisition and the production of a 3D virtual replica of the edentulous arch, thus the digitalization.⁽³⁾ This procedure is proceeded by the designing (CAD) and manufacturing (CAM) of the prosthetic restoration.⁽¹⁾

The most crucial step is data acquisition. Many studies criticized the use of intraoral scanners in completely edentulous cases, thus the current digitalized complete denture manufacturing system still requires conventional materials drawbacks and techniques in impression making.

Thus this thesis was prompted to evaluate which is better regarding denture base retention either scanning the final impression or scanning the master cast to obtain a 3D virtual model on the software upon which permanent denture base was constructed.⁽³⁾

REVIEW OF LITERATURE

I. Edentulism:

Despite the advances in oral health care, tooth loss is still prevalent around the globe. Many factors may influence frequency of tooth loss such as:

- Biological factors (dental decay, periodontal pathosis, pulpal involvement, trauma and oral and maxillofacial cancer).
- Non-biological factors (third-party payments for required processes, care accessibility, treatment options, patient decision regarding the treatment options).^(4,5)

Chronic periodontal disease and caries are considered the main reasons of tooth loss and edentulism. World health organization states that tooth caries is still widespread through majority of developed and developing countries with some countries reporting incident of 100% of their population; 5% to 20% with periodontal disease and 7% to 69% completely edentulous.⁽⁵⁾

Edentulism Sequels

Edentulous patients are considered disabled and physically impaired according to World health organization due to their incapability of performing the two essential tasks in daily life; eating and speaking. In addition to functional impairment, edentulism also causes psychological and aesthetic alterations.⁽⁶⁾

- **On General Health:**

Chewing problems after teeth loss leads to malnutrition. Due to change of the type of diet, edentulous patients often found with deficiency in minerals, proteins and vitamins and increase in cholesterol and saturated fats. These patients are higher risk of cardiovascular disease and obesity.⁽⁷⁾

This shift in body intake of nutrients makes the patient more susceptible to gastric and peptic ulcers, insulin dependent diabetes, kidney disease and sleep disorders with lower physical activity and chronic fatigue⁽⁸⁾

Moreover, the trigeminal nerve which innervates the periodontal ligaments of teeth and muscles of mastication after multiple teeth loss when its sensory signals are attenuated higher brain activities such as memory and learning are noticeably hindered.⁽⁹⁾

- **Oro-facial Health:**

The most prominent effect of edentulism is residual ridge resorption, aesthetics and soft tissue profile changes.

Mandibular residual ridge undergo resorption four times faster than maxillary residual ridge due to the less surface area subjected to force in mandible. This will lead to decrease in facial height and mandible protrusion.

Age, sex, systemic diseases, duration of edentulism, size of edentulous area, amount and type of stresses transformed to the ridge, and parafunctional habits are all factors that affect the pattern and rate of ridge resorption.^(5,8)