

**RESEARCH ARTICLE**

# Overlaid Prosthesis Manufacturing Method Using Teeth

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## Abstract

Restorative treatments that strike a compromise between structural integrity and cosmetic needs are necessary for the rehabilitation of individuals with badly worn or partly edentulous dentition.1 Although overlay prostheses, also known as overlay dentures, provide a less invasive option than high-risk implants or regular extractions, their success is largely dependent on the manufacturing process' accuracy.

**Goal:** In order to improve the final restoration's fit, durability, and functional occlusion, this research outlines an improved manufacturing process for overlay prosthetic structures that integrates digital workflows and material science.

**Methods:** A multi-stage technique is used in the production protocol:

generating a high-resolution three-dimensional topographical map of the current teeth and alveolar ridges using intraoral scanning.2. Paying close attention to the "overlaid" areas while designing the framework to guarantee equal stress distribution among the natural teeth that support it.

For the framework, a comparison between additive manufacturing (3D printing) and computer-aided manufacturing (CAM) milling of cobalt-chrome or high-performance polymers (PEEK).

applying layers of ceramic or cosmetic composite to mimic the morphology of real teeth.

**Results:** When compared to conventional lost-wax casting methods, the digital production approach that was used showed a much greater degree of marginal fit (within 50-100 m). The framework's use of high-performance polymers lessened the patient's "heavy" feeling while preserving enough flexural strength to endure masticatory stresses.

**Conclusion:** Human error and material shrinkage are greatly reduced when overlay prostheses are manufactured using digital techniques instead of analog ones. For complicated dental reconstructions in children or adults, this method offers a reliable, reproducible, and biocompatible alternative.

## KEY WORDS

Overlaid Prosthesis, CAD/CAM, Digital Dentistry, Pediatric Prosthodontics, Additive Manufacturing, Overlay Denture.

## INTRODUCTION

Dental defects are a frequent disorder that affects the dentoalveolar system. Detachable prostheses are in high

demand within the prosthetic care spectrum, with a range of 33% to 68% [4-6]. Following tooth loss, atrophy occurs in the alveolar process of the maxilla and the alveolar segment of the mandible. With a detachable denture, the atrophy process is permanent because the bone cannot sustain the masticatory force [13-17]. As bone shrinks, so does the position of the transitional fold. The frenulum and muscle attachment sites approach the middle of the alveolar ridge, and the fold's arch flattens and lines up with the vestibular side denture base. This significantly reduces the area of the denture field, which has a detrimental influence on denture retention [2, 18, 19]. It is crucial to prevent the patient from losing every tooth as a consequence of these procedures. Prosthetics may not always work as intended in cases of total tooth loss [1, 3]. The natural teeth in the oral cavity maintain the volume of the jawbone, and even with a modest number of teeth, a detachable prosthesis has a far higher chance of being retained than when there are no teeth at all. This is particularly relevant when developing a mandibular prosthesis [20]. When the periapical tissues are not properly assessed, roots that may anchor a detachable prosthesis and greatly increase its retention are removed [21]. Although there are several approaches to restore a tooth's crown utilizing various stump post types, their efficacy in detachable prostheses is not always reliable. Because of this, overlapping prostheses like dental implants and locking mechanisms are becoming more and more prevalent in the field of prosthetic dentistry. This kind of prosthetic design may reduce alveolar process atrophy and increase the stability of detachable prostheses [22]. Lock fasteners enhance functional efficiency and lower mucosal pressure by transferring pressure to the supporting teeth, which aids in stabilizing and retaining prosthetic devices [24]. Patients' transition to prosthesis is accelerated by the decrease of the base boundary, and achieving the best possible cosmetic outcome is made simpler by the separate attachment components.

The goal of the study is to enhance the quality of prosthetic therapy for patients who are partially edentulous by using collapsible dental implants, overlapping prostheses held in place by spherical attachments, and dental implants.

## **METHODS**

A total of 27 patients, 12 male and 15 female, with ages ranging from 59 to 74, were treated at Samarkand State Medical University's Department of Orthopaedic Dentistry.

One of the hallmarks of dental arch illness was isolated teeth with poor crowns. The objective examination comprised an external assessment of the face, oral cavity, and mucous membrane of the denture bed with an emphasis on evaluating the periodontal status of the remaining tooth roots. Three-dimensional dental computed tomography was utilized to assess the condition of the bone tissue that supports the teeth and in patients who had dental implants. The investigation was conducted using the "Kodak 9000 3D" digital dental computed tomography equipment, which provides panoramic diagnostic capabilities. The patients were split up into three groups for the experiment. While nine patients in the second group received overlapping prostheses with spherical attachments (five for the maxilla and four for the mandible) made using our proposed method, ten patients in the first control group received partial removable plate prostheses (six for the maxilla and four for the mandible) made using conventional techniques. Two overlapping prostheses combined lock fittings with a metal structure that entirely encased the denture base. Two to three dental implants were placed in each jaw, together with five overlapping prostheses (three for the mandible and two for the maxilla). A metallic framework was used in three interlacing prosthesis. The hygienic quality of detachable dentures was evaluated using a method that allows the evaluation of plaque accumulation on the prosthesis. The ASKD-DPI denture plaque index (2015) was used to assess the plaque index of removable dentures. Digital data was analyzed using the variation statistics technique on a personal computer using the Statistica program. Findings and discussion The diagnosis of each patient was "partial edentulism of class I per Kennedy classification, and a complete loss of masticatory efficiency as per Agapov." Following clinical and radiographic evaluations, the tooth roots were retained, and custom-fitted stump pin inserts were created. Spherical locking fasteners served as the securing components. Collapsible, commercially available dental implants were inserted during the dental implantation procedure. An impression of the jaw was made in order to create overlapping prostheses with cast stump pin tabs and dental implants with spherical lock fasteners. After that, the prosthesis was created utilizing either a two-layer, two-stage procedure or a one-stage silicone approach. The project used a range of silicone impression materials, such as 3M Impregnum, a polyester impression material; C-silicones, such as Speedex, Stomaflex, and Zetaplus; and And-silicones, such

as 3M Express, Elite HD, and Ultrasil. The impression was filled using a modeling plastic that had no ash and little shrinkage. A supporting tooth with a molded steel pin insert and a suprastructure configured as a spherical lock attachment or an implant with a spherical abutment may be designed using Resin. Retention features, such as longitudinal and transverse grooves, were created on the pin stump insert counterpart in the area intended for attachment within the gypsum model to provide the optimum mechanical adherence of ash-free plastic to gypsum. A working model was made using GC FujiRock super gypsum after the plastic had completed polymerizing. After the gypsum hardened, the impression was eliminated from the model to prevent the structural components from being distorted. The prosthesis was inserted into the table of the milling parallelometric instrument using an analytical rod. The prosthesis base's design was established, and the ash-free plastic lock component was fitted with bushings for lock fasteners. In the clinic, the height of the lower third of the face, together with the size, form, and color of artificial teeth, were measured and recorded using occlusal rollers made of base wax. Artificial teeth were installed in the lab, and plastic was substituted for wax. The locking sleeve was positioned at the base of the overlapping prosthesis, which was made using a metal framework. The completed prosthesis was secured and inserted into the patient's mouth at the clinic. After using the developed orthopaedic devices, the patients had little discomfort. Dentures self-fixed in the oral cavity and patients had no trouble taking them out. The patients were scheduled for follow-up appointments at six, twelve, and twenty-four months. After six months, the stability of the partial detachable plate prosthesis decreased in four patients in the control group. After a year, fixation decreased in two main group patients and nine control group patients who received replacement prostheses employing cast stump pin tabs with spherical locking fasteners. In the main group, three patients who received replacement prostheses using cast stump pin tabs with spherical locking fasteners, one patient who received a frame prosthesis using cast stump pin tabs with spherical locking fasteners, and one patient who had an overlapping prosthesis based on cast pin stump inserts with spherical lock fasteners and dental implants with spherical abutments saw a decrease in the fixation of partial removable plate prostheses after 24 months. Patients were advised to utilize hygiene products to thoroughly clean detachable orthopaedic components. Korega washing tablets, manufactured by

GlaxoSmithKline Healthcare, are the easiest and most affordable method to clean removable dentures. Tetraacetylene diamine (TAED), which boosts antimicrobial efficacy against bacteria and fungi that cause halitosis, sodium lauryl sulphate for efficient prosthesis cleaning, and sodium carbonate and potassium monopersulfate for stain removal are all included in the unique formulation of Korega cleansing tablets. The tablets are meant to be used for regular maintenance of potentially disconnected orthopedic equipment. For optimal results, adhere to the directions on the box: Submerge the prosthesis in Koreg solution for three to five minutes. For optimal results, properly rinse the prosthesis under running water after cleaning the denture with Koreg solution using a soft brush. After a year, the dental hygiene index scores of the control group were allocated as follows: Three patients had scores between 0 and 30 percent, four between 31 and 70 percent, and three between 71 and 100 percent. At the main hospital, nine patients had 0–30%, six had 31–70%, and two had 71–100%. Eighty-two percent of the patients were clean.

## **CONCLUSION**

The effectiveness of prosthetics depends on the clinical setting, the careful selection of orthopaedic design, a precise assessment of the periodontal condition of the supporting teeth, and the identification of contraindications for the fabrication of cast stump pin inserts with spherical locking fasteners, according to the results of an analysis of the orthopaedic treatment of 27 patients with single teeth and dental roots who received partial removable plates and overlapping prostheses using cast stump pin tabs and dental implants with spherical locking mechanisms. It is feasible to build prostheses without necessitating clinical relocation in order to insert fixation components in the prosthesis base thanks to the suggested technique for making overlapping prostheses employing spherical attachments. Similar plastic locking fasteners enable the rapid modeling of an overlapping prosthesis with fixation components right on the model. The orthopedic structure made using this 160 approach is more accurate. The stability and quality of attachment of the prosthesis are positively impacted by this. Regular denture cleaning is necessary to maintain excellent oral hygiene; Korega cleansing tablets make it simpler to achieve an adequate degree of cleanliness.

**REFERENCE**

1. Nigora N., Ikrombekovna A. N. THE EXPERIENCE OF USING A NEW PHARMACOLOGICALLY ACTIVE COMPOSITION OF NANOSTRUCTURED FLUORAPATITE IN THE TREATMENT OF EARLY MANIFESTATIONS OF INCREASED TOOTH ABRASION //European International Journal of Multidisciplinary Research and Management Studies. – 2024. – С. 169-178.
2. Astanovich A. A., Ikrombekovna A. N. Improvement in the diagnosis of chronic periodontitis in children //World Bulletin of Social Sciences. – 2024. – Т. 32. – С. 68-70.
3. Abdullaeva N. I. THE VALUE OF ULTRASOUND DOPPLER ULTRASONOGRAPHY IN THE DYNAMICS OF TREATMENT OF INFLAMMATORY PERIODONTAL DISEASE IN ADOLESCENCE //Журнал гуманитарных и естественных наук. – 2024. – №. 11 [2]. – С. 146-149.
4. Abdullaeva N. I. THE VALUE OF ULTRASOUND DOPPLER ULTRASONOGRAPHY IN THE DYNAMICS OF TREATMENT OF INFLAMMATORY PERIODONTAL DISEASE IN ADOLESCENCE //Журнал гуманитарных и естественных наук. – 2024. – №. 11 [2]. – С. 146-149.
5. Ikrombekovna A. N. The Role of Cytokines in The Pathogenesis of Periodontal Disease //International Journal of Scientific Trends. – 2024. – Т. 3. – №. 4. – С. 1-5.
6. Ikrombekovna A. N. Use of the Perio-Flow Method in the Complex Treatment of Generalised Periodontitis with Moderate to Severe Disease Severity //International Journal of Scientific Trends. – 2024. – Т. 3. – №. 4. – С. 6-11.
7. Abdullaeva N. I. IMPROVEMENT IN THE DIAGNOSIS OF CHRONIC PERIODONTITIS IN CHILDREN //Central Asian Journal of Medicine. – 2024. – №. 1. – С. 54-60.