

CLINICAL AND BIOLOGICAL EFFECTIVENESS OF RETROMOLAR AUTOTRANSPLANTATION IN RESTORING PERI-IMPLANT BIOLOGICAL WIDTH

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Introduction

Modern dental implantology is one of the advanced clinical fields aimed at meeting not only functional but also aesthetic demands of patients. The long-term success of dental implants largely depends on the stability of the surrounding hard and soft tissues. In particular, insufficient formation of the peri-implant biological width may lead to inflammatory processes, peri-implant bone resorption, and aesthetic complications.

The concept of biological width refers to the minimum dimensions of soft and hard tissues required to maintain a healthy peri-implant environment. Insufficiency of these parameters negatively affects implant integration and worsens long-term prognosis. Therefore, restoration of peri-implant biological width remains a relevant issue in clinical dentistry.

In recent years, interest in the use of autogenous materials for biological width reconstruction has increased. Autotransplants harvested from the mandibular retromolar area have attracted attention as a biologically compatible, immunologically safe source with high regenerative potential. However, the effectiveness of this method in restoring peri-implant biological width has not been sufficiently studied.

Aim of the Study

To evaluate the clinical, radiological, and biological effectiveness of autotransplants harvested from the retromolar area in restoring peri-implant

biological width and to scientifically substantiate their impact on peri-implant soft tissues.

Materials and Methods

The study was conducted using a prospective clinical observational design. A total of 40 patients aged 20–60 years, scheduled for dental implant placement and diagnosed with biological width deficiency, were included. Patients were randomly divided into two groups.

The main group (n=20) consisted of patients in whom peri-implant biological width was restored using autotransplants obtained from the mandibular retromolar area. In the control group (n=20), biological width reconstruction was performed using standard surgical techniques.

Clinical assessment included evaluation of peri-implant soft tissue condition, gingival width, mucosal thickness, and aesthetic parameters. Postoperative pain intensity was assessed using the Visual Analog Scale (VAS). Radiological evaluation was performed using cone-beam computed tomography (CBCT), and bone density was measured in Hounsfield units (HU). Measurements were carried out at 3, 6, and 12 months after implant placement.

Statistical analysis was performed using SPSS software (version 26). Student's t-test, Wilcoxon test, and ANOVA were applied to assess intergroup differences. Statistical significance was set at $p < 0.05$.

Results

The results demonstrated that the thickness of peri-implant soft tissues and biological width parameters were significantly higher in the main group compared to the control group ($p < 0.05$). Patients treated with retromolar autotransplants showed faster and more stable integration of soft tissues.

Radiological examinations revealed higher bone density values and minimal peri-implant bone resorption in the main group. HU values remained stable over time, indicating favorable osteointegration of the implants.

According to VAS assessment, postoperative pain intensity was lower in the main group compared to the control group. Additionally, edema and other postoperative complications occurred less frequently.

Discussion

The obtained results confirm that autotransplants harvested from the retromolar area represent an effective and safe method for restoring peri-implant biological width. The use of biologically compatible autogenous material promotes physiological regeneration of peri-implant tissues.

Compared with conventional methods, retromolar autotransplantation is associated with fewer postoperative complications, faster soft tissue adaptation, and improved aesthetic outcomes. These advantages contribute to enhanced long-term implant stability and improved patient quality of life.

Conclusion

The use of autotransplants harvested from the mandibular retromolar area for restoring peri-implant biological width is a clinically and biologically effective approach. This method improves peri-implant soft tissue stability, reduces postoperative complications, and ensures long-term implant success.

The introduction of retromolar autotransplantation into clinical practice may be recommended as a promising and innovative approach for biological width restoration in dental implantology.

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