PO-94

CLINICAL RESEARCH – SURGERY

Efficiency of xenografts with or without hyaluronic acid in a peri-implantitis surgery. Pilot study

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Abstract

Background: The goal of the periimplantitis surgical procedure is to stop disease progression allowing the tissue to repair. Different biologically active materials were combined as adjunctive with xenografts in order to achieve successful outcomes in regenerative surgical peri-implantitis therapy. Hyaluronic acid (HA) was merged with a bovine bone substitute (BBS) in order to overcome the lack of osteoinductive and osteogenic properties of xenografts trying to prompt the process of osteogenesis. The pilot study aimed to assess clinical, microbiological, and radiography outcomes three and six months following regenerative surgical therapy of peri-implantitis lesion using either BBS with or without hyaluronic acid (HA) combined with collagen dermal matrix.

Material and Methods: The fourteen patients (mean age 51.23 + 11.3) were randomly divided into two groups: test (T) and control (C). After mucoperiosteal flap evaluation and granulation tissue removal, the implant surface was performed by means of titanium brushes and photodynamic therapy. The peri-implant bone defects were randomly treated with the bovine bone substitute with or without HA. Afterwards, the dermal matrix was placed over the grafts. Clinical parameters such as peri-implant probing depth (PPD), bleeding on probing (BOP), healing index (HI) score, keratinized tissue width (KTW), gingival thickness (GT); radiography and microbiological outcome, and implant stability (ISQ) were assessed 3 and 6 months postoperatively. Samples for microbiological analyses were collected before treatment procedure, during a surgical procedure, and during follow-up periods.

Results: Peri-implantitis was diagnosed after 5.6 + 3.1 years of implant loading around bone-level implants, mainly affecting the maxilla (83%) compared to the mandibula. Compared to baseline, both groups showed statistically significant improvements in clinical, radiographic, and microbiological outcomes three and six months postoperatively ($p < 0.05$). The HI scored better on the test group. In the test group, there was a significant reduction in BOP compared with the control one six months after the surgery ($p < 0.05$). In this pilot study, no differences in radiography were detected between the groups ($p= 0.087$). A significant reduction in ISQ was observed after peri-implantitis surgical debridement. After debridement and augmentation of peri-implantitis defects, there was no difference in ISQ. Three and six months postoperatively, the ISQ of the test group increased slightly compared to the control group.

Conclusion and clinical relevance: A short-term pilot study found that hyaluronic acid combined with bovine bone substitute (BBS) improved clinical and radiographic outcomes. HA could reduce the signs of inflammation such as BOP, thus preventing bacterial recolonization.

Background and Aim

Peri-implantitis is defined as an inflammatory process that affects the supporting marginal bone around the implant in function, resulting in bone resorption. Periodontopathogenic bacteria formed around an osseointegrated implant could lead to excessive stimulation of the immune response, resulting in a peri-implant lesion.

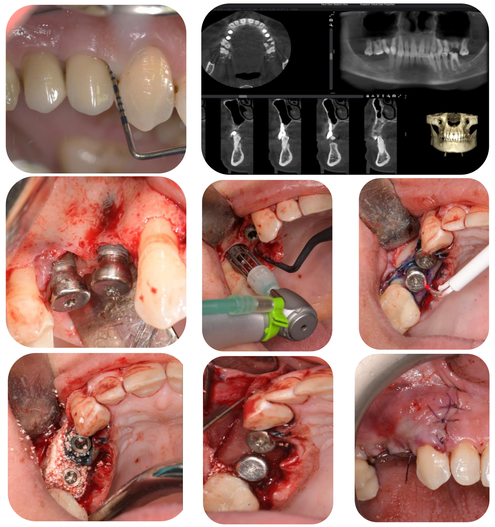
The goal of the peri-implantitis surgical procedure is to stop disease progression allowing the tissue to repair. Different biologically active materials were combined as adjunctive with xenografts in order to achieve successful outcomes in regenerative surgical peri-implantitis therapy. Hyaluronic acid (HA) was merged with a bovine bone substitute (BBS) in order to overcome the lack of osteoinductive and osteogenic properties of xenografts trying to prompt the process of osteogenesis.

The pilot study aimed to assess clinical, microbiological, and radiography outcomes three and six months following regenerative surgical therapy of peri-implantitis lesion using either BBS with or without hyaluronic acid (HA) combined with collagen dermal matrix.

Methods and Materials

The study was conducted at both Departments of Oral Surgery and Prosthodontics, Faculty of Dental Medicine, University of Belgrade (NCT05171582). The fourteen patients (mean age 51.23 + 11.3) with a minimum of one or more early, moderate, and advanced stages of the peri-implant lesion were included in the study. All patients underwent through the surgical and prosthetic phases.

Clinical parameters including peri-implant probing depth (PPD), bleeding on probing (BOP), healing index (HI) score, keratinized tissue width (KTW), gingival thickness (GT), ISQ; radiography, and microbiological outcome were assessed 3 and 6 months postoperatively.

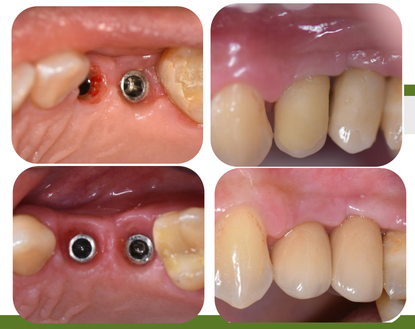


Surgical treatment phase

After mucoperiosteal flap evaluation and granulation tissue removal, implant stability (ISQ) was measured and the implant surface was performed by titanium brushes and photodynamic therapy (HELBO). The peri-implant bone defects were randomly divided into test (T) and control (C) group. In the T group bone defects were treated with BBS with HA (Cerabone plus, Botiss, Germany), while in the C group, defects were treated with BBS without HA (Cerabone, Botiss, Germany). Afterwards, the dermal matrix was placed over the grafts (Mucoderm, Botiss, Germany) and the second ISQ was measured, respectively. Flap was reposition and sutured. Sutures were removed 14 days postoperatively.

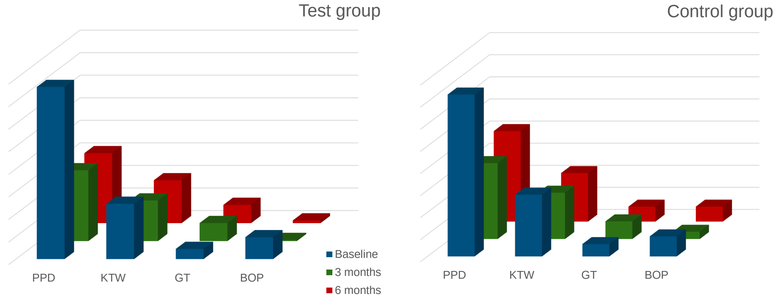
Prosthodontic treatment phase

In the first visit, the crown was removed, and the impression for the temporary crown was taken. A temporary crown was fixed immediately or one month after the surgical procedure, while the new permanent crown was made a minimum of three months after surgery. All crowns were screw-retained. Additionally, dental implant emergent profile were evaluated at three and six months.



Results

Peri-implantitis was diagnosed after 5.6 + 3.1 years of implant loading around bone-level implants, mainly affecting the maxilla (83%) compared to the mandibula. Compared to baseline, both groups showed statistically significant improvements in clinical, radiographic, and microbiological outcomes three and six months postoperatively ($p < 0.05$). The HI scored better on the test group



In the test group, there was a significant reduction in BOP compared with the control one six months after the surgery ($p < 0.05$). There were no differences in radiography between the groups ($p= 0.087$). A significant reduction in ISQ was observed after peri-implantitis surgical debridement. After debridement and augmentation of peri-implantitis defects, there were no differences in ISQ. Three and six months postoperatively, the ISQ of the test group increased slightly compared to the control group.

Conclusion

A short-term pilot study found that hyaluronic acid combined with bovine bone substitute (BBS) improved clinical and radiographic outcomes. HA could reduce the signs of inflammation such as BOP, thus preventing bacterial recolonization. Accordingly, BBS with HA might promote bone formation around the implant, improving wound healing compared to BBS alone. Therefore, BBS with HA could be applied in peri-implantitis regenerative surgical procedures.

References

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