



Scientific Highlights

SHORT OVERVIEWS ON RECENTLY PUBLISHED SCIENTIFIC EVIDENCE.

Issue 4/2020

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EDITOR'S CHOICE

Healing of periodontal suprabony defects following treatment with open flap debridement with or without an enamel matrix derivative: A randomized controlled clinical study

(Iorio-Siciliano V et al. 2020)

and

Status report on dental implantology in Switzerland. An updated cross-sectional survey

(Sekerci E et al. 2020)

The Effect of Age of Titanium Dental Implants on Implant Survival and Marginal Bone Resorption: 5-Year Retrospective Follow-up Pilot Study

(Cigerim L et al. 2020)

Retention and wear of resin matrix attachments for implant overdentures

(Wichmann N et al. 2020)

Editor's choice

Clin Oral Investig. 2020 Jun 19.

Healing of periodontal suprabony defects following treatment with open flap debridement with or without an enamel matrix derivative: A randomized controlled clinical study

Iorio-Siciliano V, Blasi A, Stratul S, Ramaglia L, Octavia V, Salvi G E, Sculean A

Study objectives and methods

The aim of this study was to compare the healing of suprabony defects following treatment with either open flap debridement (OFD) and application of an enamel matrix derivative (EMD) with OFD alone.

Eighty patients with suprabony periodontal defects were randomly assigned to treatment with OFD + EMD (test) or OFD alone (control). The primary outcome variable was the difference in clinical attachment level (CAL) gain. At baseline and after 12 months, full-mouth plaque scores (FMPS), full-mouth bleeding scores (FMBS), probing depths (PD), gingival recessions (GR), and CAL were recorded

Results

- Sixty-five patients were available for the 12-month follow-up examination.
- At 12 months, the mean FMPS was $21.9 \pm 3.0\%$ in the OFD + EMD and $21.1 \pm 2.4\%$ in the OFD group, respectively ($p = 0.30$), while mean FMBS measured $20.4 \pm 3.4\%$ in the OFD + EMD group and $19.9 \pm 2.9\%$ in the OFD group ($p = 0.48$).
- Mean CAL gain at sites treated with OFD + EMD was statistically significantly different ($p = 0.0001$) compared with sites treated with OFD alone (3.4 ± 0.6 mm vs 1.8 ± 0.6 mm).
- A statistically significant difference ($p = 0.0001$) was found between mean PD change in the OFD + EMD (3.9 ± 0.6 mm) and OFD alone (3.2 ± 0.6 mm) treated groups and also in terms of mean GR change between treatment with OFD + EMD (0.5 ± 0.7 mm) and OFD alone (1.4 ± 1.0 mm) ($p = 0.001$).

Conclusions

Within their limits, the present results indicate that in suprabony periodontal defects, the application of EMD in conjunction with OFD may additionally improve the clinical outcomes compared with OFD alone

Adapted from Iorio-Siciliano V et al., Clin Oral Investig. 2020 Jun 19, for more info about this publication click [HERE](#)

Swiss Dent J 2020 Jun 15;130(6):486-492.

Status report on dental implantology in Switzerland. An updated cross-sectional survey

Sekerc E i, Lambrecht J T, Mukaddam K, Köhl S



Abstract

A status report of dental implantology in Switzerland has already been performed in 1994 and 2006. The present study, based on these former surveys, aimed to update these results for the year 2016. To this end, a questionnaire was sent to all dentists in Switzerland who were members of the Swiss Dental Society (SSO) at the time of the survey.

The questionnaire asked for personal background data and obtained information about the dentists' knowledge and concepts when using implants, the extent to which they used implants and about specific implant systems, which were selected based on the previous surveys. Out of 3,168 questionnaires, 1,446 were returned (return rate: 45.6%).

Approximately 91% of the responding dentists had a practical involvement in implantology (implant placement only, superstructure insertion only, or both). Just over half of them (53%) placed more than twenty implants per year.

Good handling was chosen by all dentists (100%) as a selection criterion for the implant system they used preferably. The current data suggested that the range of indications had widened, yet that the edentulous mandible was still the indication of choice.

The percentage of dentists engaged in dental implantology doubled from 1994 to 2006 (1994: 42.2%, 2006: 82.2%). An increase of almost 10% in dentists involved in dental implantology was also apparent from 2006 to 2016 (2006: 82.2%, 2016: 91%). Our data show that, whilst the relative number of implant users had greatly increased among Swiss dentists, their rationale to place implants has remained similar.

Adapted from Sekerci E et al., Swiss Dent J 2020 Jun 15;130(6):486-492. for more info about this publication click [HERE](#)

J Oral Implantol. 2020 May 5.

The Effect of Age of Titanium Dental Implants on Implant Survival and Marginal Bone Resorption: 5-Year Retrospective Follow-up Pilot Study

Cigerim L, Kaplan V

Study objectives and methods

The aim of this study was to evaluate whether the age of sand blasted and acid-etched (SLA) titanium dental implants (duration from the production date until the date of dental implant surgery) affects marginal bone resorption and implant survival.

This non-random conveniently sampled retrospective pilot study was carried out in 200 implants of 64 patients. Radiographic measurements were performed on intraoral periapical radiographs. Implants were divided into two age groups; Group 1: 0-3 months, Group 2: 36-41 months.

Results

- It was observed that ages of 41% (n= 82) of the implants were between 0-3 months and 59% (n= 118) were between 36 and 41 months. It was observed that 100% (n= 200) of the implants survived and maintained their function.
- The mean mesial marginal resorption measurements were 0.60 ± 0.65 mm and the mean distal marginal resorption was 0.77 ± 1.07 mm.
- There was no statistically significant difference between the amounts of mesial and distal marginal bone resorption according to the implant age ($p>0.05$).

Conclusions

In SLA surface titanium implants with adequate initial primary stability and 3-months osseointegration period before loading, biological aging of titanium does not affect implant survival and marginal bone resorption.

Adapted from Cigerim L et al., J Oral Implantol. 2020 May 5, for more info about this publication click [HERE](#)

J Mechl Behav Biomed Mater; Volume 110

Retention and wear of resin matrix attachments for implant overdentures

Wichmann N, Kerna M, Taylor T, Wille S, Passiaa N

Study objectives and methods

The aim of the present laboratory study was to investigate the retentive properties and the wear of three different resin matrix attachments for implant overdentures as well as to assess the effects of implant angulation. Three attachment systems with either polyetheretherketone inserts (PEEK; Novaloc, Straumann, Basel, Switzerland), polyetherketoneketone inserts (PEKK; CM Loc, Cendres + Métaux, Biel, Switzerland) or nylon inserts (Locator R-Tx, Zest Dental Solutions, Escondido, California, USA) were evaluated. The patrices were connected to their implant analogues and fixed in a resin cast at implant angulations of 0° and 15°. The corresponding matrices with inserts were fixed in a stylized unilaterally removable dental prosthesis. To simulate masticatory forces 30,000 insertion and removal cycles with an eccentric load of 100 N at a distance of 12 mm were performed in a chewing simulator. The retention forces were measured. The wear patterns were examined using a scanning electron microscope (SEM).

Results

- All attachment systems revealed a significant decrease in retention after testing, except PEEK 0°/0° and PEEK 15°/15°.
- PEEK and PEKK attachment systems showed significantly higher retentive forces than the nylon attachment system between 5,000 and 30,000 cycles.
- The implant angulation did not significantly influence the retention behavior for any of the three attachment systems.
- Patrices showed no signs of wear, whereas the matrix inserts displayed signs of deformation.

Conclusions

Within the limitations of the present study, attachments with PEEK and PEKK inserts combined with titanium patrices are favorable for long-term use, both for orthogonal and tilted implants. All three attachment systems showed a high variability of the retentive forces at baseline and for subsequent cycles. This should be taken into consideration for clinical use

Adapted from Wichmann et al N., J Mechl Behav Biomed Mater; Volume 110, for more info about this publication click [HERE](#)

Biomed Tech (Berl).2020 Jun 24.

Insertion torque/time Integral as a Measure of Primary Implant Stability

Grobecker-Karl T, Karl M, Steiner C

Study objectives and methods

The goal of this in vitro study was to determine the insertion torque/time integral for three implant systems. Bone level implants (n = 10; BLT - Straumann Bone Level Tapered 4.1 mm × 12 mm, V3 - MIS V3 3.9 mm × 11.5 mm, ASTRA - Dentsply-Sirona ASTRA TX 4.0 mm × 13 mm) were placed in polyurethane foam material consisting of a trabecular and a cortical layer applying protocols for medium quality bone. Besides measuring maximum insertion torque and primary implant stability using resonance frequency analysis (RFA), torque time curves recorded during insertion were used for calculating insertion torque/time integrals.

Results

- Significantly greater mean maximum insertion torque (59.9 ± 4.94 Ncm) and mean maximum insertion torque/time integral (961.64 ± 54.07 Ncm*s) were recorded for BLT implants ($p < 0.01$).
- V3 showed significantly higher mean maximum insertion torque as compared to ASTRA ($p < 0.01$), but significantly lower insertion torque/time integral ($p < 0.01$).
- Primary implant stability did not differ significantly among groups.
- Only a single weak ($r = 0.61$) but significant correlation could be established between maximum insertion torque and insertion torque/time integral ($p < 0.01$) when all data from all three implant groups were pooled.

Conclusions

Implant design (length, thread pitch) seems to affect insertion torque/time integral more than maximum insertion torque

Adapted from Grobecker-Karl. T et al., Biomed Tech (Berl).2020 Jun 24., for more info about this publication click [HERE](#)

Clin Oral Investig 2020 Jun 21.

Ultrastructural changes of smooth and rough titanium implant surfaces induced by metal and plastic periodontal probes

Folwaczny M, Rudolf T, Frasher I, Betthäuser M

Study objectives and methods

To determine the ultrastructural changes of titanium surfaces of dental implants induced by the tip of periodontal probes. A total of 40 samples of smooth and rough surfaces of titanium implants were randomly assigned for the treatment with metal or plastic periodontal probes under application angles of 20° and 60°. Titanium surfaces have been evaluated with CLSM prior and following to experimental probing determining various standardized 2D and 3D roughness parameters.

Results

- The average profile and surface roughness (Ra and Sa) showed no significant difference between treated and untreated samples on smooth and rough surface areas irrespective of the probe material.
- On smooth surfaces several amplitude roughness parameters were increased with metal probes but reached significance only for Rp ($p = 0.007$).
- Rough surface parts showed a slight but not significant reduction of roughness following to the contact with metal probes.
- The surface roughness remained almost unchanged on smooth and rough implant surfaces using plastic probes.
- The surface roughness on implant surfaces was not dependent on the application angle irrespective of the probe material

Conclusions

Probing of titanium implants with metal probes and even less with plastic probes causes only minor changes of the surface roughness. The clinical significance of these changes remains to be elucidated. Using plastic probes for the clinical evaluation of the peri-implant sulcus might avoid ultrastructural changes to titanium implant surfaces

Adapted from Folwaczny M et al., Clin Oral Investig 2020 Jun 21, for more info about this publication click [HERE](#)

JDR Clin Trans Res.2020 Jun 19 ; doi: 10.1177/2380084420934731.

Effect of Flap Design for Enamel Matrix Derivative Application in Intraosseous Defects

Trombelli L, Simonelli A, Quaranta A, Tu Y K, Li H, Agosto M, Jiao X, Farina R

Study objectives and methods

To systematically review the literature addressing the focused question: What is the effectiveness of different surgical and nonsurgical procedures combined with enamel matrix derivative (EMD) on clinical, radiographic, and patient-centered outcomes in intraosseous defects?

Data from 42 selected articles were used to perform a network meta-analysis, and a hierarchy of surgical and nonsurgical applications of EMD was built separately for EMD and EMD + graft based on 6- to 12-mo clinical and radiographic outcomes.

Results

- Among surgical approaches, EMD was associated with best regenerative outcomes when applied through SFVs, with a mean clinical attachment level gain of 3.93 mm and a reduction in the intrabony component of the defect of 3.35 mm.
- For EMD + graft, limited differences in regenerative outcomes were observed among surgical procedures. PPVs were associated with the highest residual probing depth for EMD (4.08 mm) and EMD + graft (4.32 mm).

Conclusions

In the treatment of periodontal intraosseous defects,

- SFVs appear to optimize the regenerative outcomes of EMD;
- substantial regenerative outcomes can be obtained with SFVs and conservative double flaps (i.e., PPVs and minimally invasive variants) when EMD is combined with a graft; and
- residual probing depth was higher following PPVs for EMD and EMD + graft

Adapted from Trombelli L et al., JDR Clin Trans Res.2020 Jun 19, for more info about this publication click [HERE](#)

J Clin Periodontol. 2020 Jun 27

Systematic review and sequential network meta-analysis on the efficacy of periodontal regenerative therapies

Tsai S, Ding Y, Shih M, Tu Y

Study objectives and methods

We aimed to update a previous network meta-analysis comparing the efficacy of periodontal regenerative therapies on the treatment of infra-bony lesions.

Seven clinical trials were added after literature research for studies published between January 2011 and September 2019. We conducted network meta-analysis (NMA) to compare the effects of guided tissue regeneration (GTR), enamel matrix derivatives (EMD) and their combination therapies on probing pocket depth (PPD) reduction and clinical attachment level (CAL) gain. Sequential network meta-analysis (SNMA) was also used to control the type-I error rate due to multiple testing.

Results

- A total of 60 studies were included.
- For both PPD reduction and CAL gain, the flap operation (FO) was the least effective treatment.
- Although the differences between periodontal regenerative therapies were small, GTR attained the greatest reduction in PPD, and EMD with bone graft the greatest CAL gain compared to other therapies.
- SNMA used stricter efficacy criteria, yielding slightly different results from NMA.

Conclusions

EMD, GTR, and their combined therapies were more effective than flap operation, although the differences between regenerative therapies remain small in this updated study. SNMA reduces the risk of false-positive findings, thereby providing more robust evidence on the superiority of treatments

Adapted from Tsai S et al., J Clin Periodontol. 2020 Jun 27, for more info about this publication click [HERE](#)

References

Iorio-Siciliano V et al., Clin Oral Investig. 2020 Jun 19 | Sekerci E et al., Swiss Dent J 2020 Jun 15;130(6):486-492 | Cigerim L et al., J Oral Implantol. 2020 May 5, | Wichmann N et al., J Mechl Behav Biomed Mater; Volume 110 | Grobecker-Karl T et al., Biomed Tech (Berl).2020 Jun 24 | Folwaczny M et al., Clin Oral Investig 2020 Jun 21 | Trombelli L et al., JDR Clin Trans Res.2020 Jun 19 | Tsai S et al., J Clin Periodontol. 2020 Jun 27 | source: www.pubmed.gov | Dr Nair holds a position of Global Scientific Communications Manager at Institute Straumann in Basel, Switzerland.