



Scientific Highlights

SHORT OVERVIEWS ON RECENTLY PUBLISHED SCIENTIFIC EVIDENCE.

Issue 6/2020

Edited by Dr Pooja Nair

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EDITOR'S CHOICE

Immediate Placement and Restoration of a New Tapered Implant System in the Aesthetic Region: A Report of Three Cases

(C M Meijndert et al. 2020)

and

Effect of systemic antibiotics on the outcomes of regenerative periodontal surgery in intrabony defects: a randomized, controlled, clinical study

(M Pietruska et al. 2020)

Application of enamel matrix derivative in conjunction with non-surgical therapy for treatment of moderate to severe periodontitis: A 12-month, randomized prospective, multicenter study

(R A Schallhorn et al. 2020)

A Pilot Study of Small-Diameter One-Piece Ceramic Implants Placed in Anterior Regions: Clinical and Esthetic Outcomes at 1-Year Follow-up

(C Kunavisarut et al. 2020)

Editor's choice

Case Rep Dent 2020 Jul 25;2020:7632692.

Immediate Placement and Restoration of a New Tapered Implant System in the Aesthetic Region: A Report of Three Cases

C M Meijndert, G M Raghoobar, A Vissink, H J A Meijer



Study objectives and methods

To assess the clinical, radiographic, aesthetic, and patient-centred outcomes of a new implant system applied for an immediate implant placement and restoration approach in single tooth replacement of anterior maxillary teeth.

Three cases were treated with a bone level tapered implant (BLX). All patients were treated with the same strategy involving flapless extraction and implant placement with simultaneous augmentation. Implants were provisionally restored with a screw-retained restoration at the day of surgery. Definitive restoration was fabricated after 3 months. Follow-up was one year after definitive restoration.

Results

- At the 1-year follow-up, the implants were stable, and no complications had occurred.
- Peri-implant bone levels had increased with a mean value of 0.24 ± 0.30 mm between definitive restoration placement and 1 year of follow-up. Clinical outcome scores showed healthy soft tissues.
- Mean Pink and White Esthetic scores were rated 7.0 and 7.3, respectively.
- Mean patient satisfaction had improved from 55.7 (pretreatment) to 90.0 (1-year follow-up) on a 0-100 VAS scale.

Conclusion

Immediate implant placement and restoration with the new tapered bone level implant system (BLX) are accompanied by good initial clinical and radiographic results as well as high patient satisfaction.

Adapted from C M Meijndert et al., *Case Rep Dent* 2020 Jul 25;2020:7632692., for more info about this publication click [HERE](#)

Clin Oral Investig 2020 Oct 13.

Effect of systemic antibiotics on the outcomes of regenerative periodontal surgery in intrabony defects: a randomized, controlled, clinical study

M Pietruska, E Dolińska, R Milewski, A Sculean

Study objectives and methods

To assess the potential influence of systemic antibiotic administration on the healing of periodontal intrabony defects treated with deproteinized bovine bone mineral (DBBM) and collagen membrane.

Forty-one intrabony defects were treated by means of DBBM and collagen membrane (GTR). Postoperatively, the patients received either systemic antibiotics (i.e., 1 g of amoxicillin, twice daily for 7 days) (test) or no antibiotics (control). Clinical attachment level (CAL), probing depth (PD), and gingival recession (GR) were measured at baseline and at 1 year following regenerative surgery. The depth of the intrabony component (INTRA DD) and its width (INTRA DW) were measured during surgery and after 1 year at reentry. The depth (RxD) and width (RxW) of the intrabony defects were evaluated radiographically at baseline and at 1 year.

Results

- No adverse events were observed in any of the two groups throughout the entire study period.
- In the test group, mean CAL changed from 8.7 ± 1.4 mm at baseline to 5.0 ± 1.7 mm at 1 year ($p < 0.0001$), while PD decreased from 7.8 ± 1.5 mm at baseline to 4.0 ± 0.9 mm at 1 year ($p < 0.0001$).
- In the control group, mean CAL changed from 8.6 ± 1.9 mm to 5.9 ± 1.6 mm ($p < 0.001$) and mean PD improved from 7.4 ± 1.3 mm to 4.1 ± 1.3 mm ($p < 0.001$).
- Mean CAL gain measured 3.6 ± 1.6 mm in the test and 2.7 ± 1.6 mm in the control group, respectively.
- Defect fill (i.e., INTRA DD gain) at re-entry measured 3.7 ± 1.8 mm in the test and 2.7 ± 2.1 mm in the control group.
- A CAL gain of ≥ 3 mm was measured in 76% of the defects in the test group and in 40% of the defects in the control group, respectively. In both groups, all evaluated clinical and radiographic parameters improved statistically significantly compared with baseline, but no statistically significant differences were found between the two groups.

Conclusion

Within their limits, the present study has failed to show any substantial added clinical benefits following the postoperative administration of amoxicillin in conjunction with regenerative periodontal surgery using DBBM and GTR.

Adapted from M Pietruska et al., Clin Oral Investig 2020 Oct 13 for more info about this publication click [HERE](#)

J Periodontol 2020 Sep 29

Application of enamel matrix derivative in conjunction with non-surgical therapy for treatment of moderate to severe periodontitis: A 12-month, randomized prospective, multicenter study

R A Schallhorn, P K McClain, V Benhamou, J H Doobrow, H M Grandin, A Kasaj

Study objectives and methods

Treatment of periodontitis aims to halt progressive bone and attachment loss and regenerate periodontal structures. In this study, the effect of using an enamel matrix derivative (EMD) as an adjunct to non-surgical periodontal therapy (test) versus non-surgical therapy alone (control) was evaluated.

A prospective, split-mouth, multi-center study evaluated scaling and root planing (SRP) with and without EMD in 51 patients presenting with moderate to severe periodontitis (PPD = 5 to 8 mm) in at least 2 pockets per contralateral quadrants within the same arch. The primary outcome variable was change in clinical attachment level (CAL) after 12 months. Secondary variables included probing pocket depth (PPD), bleeding on probing (BoP), gingival margin level, dentin hypersensitivity, and percent of pockets converted to sites no longer requiring surgical treatment.

Results

- CAL changed significantly ($P < 0.001$) from baseline to 12 months for both treatment modalities (test = -2.2 ± 1.5 mm versus control = -2.1 ± 1.3 mm) and similarly for PPD; the difference between groups was not significant.
- A significant difference, favoring test conditions, was observed in percentage of both healthy PPDs (pockets < 5 mm) and converted pockets (sites no longer requiring surgical treatment); 79.8% of test versus 65.9% of control sites.
- BoP decreased significantly more ($P < 0.05$) in test sites (BoP at 17.8% test versus 23.1% control).

Conclusion

Both test and control treatments resulted in significant improvements in CAL and PPD. The adjunct use of EMD with SRP resulted in significantly greater improvements in overall periodontal health with less frequent BoP and a higher number of healthy PPDs.

Adapted from R A Schallhorn, et al., J Periodontol 2020 Sep 29, for more info about this publication, click [HERE](#)

Int J Oral Maxillofac Implants Sep/Oct 2020;35(5):965-973.

A Pilot Study of Small-Diameter One-Piece Ceramic Implants Placed in Anterior Regions: Clinical and Esthetic Outcomes at 1-Year Follow-up

C Kunavisarut, L Buranajanyakul, J Kitisubkanchana, P Pumpaluk

Study objectives and methods

The aim of this study was to evaluate the clinical, esthetic, and patient-reported outcomes of one-piece zirconia implants placed in incisal areas using digital surgical templates after 1 year of follow-up.

Patients who had lost an anterior tooth received a 3.3-mm-diameter zirconia implant placed by computer-guided surgery. Implant survival and soft tissue conditions were assessed periodically 1 week, 3 months, 6 months, and 1 year after loading. Standardized radiographs were taken at definitive prosthesis insertion and 1-year post loading to evaluate peri-implant bone loss. Additionally, the esthetic outcomes and patient-reported outcomes were also investigated.

Results

- Twenty zirconia implants were placed in 20 patients with no implants lost, resulting in 100% survival rates.
- A minor change in the mean marginal bone level (0.14 ± 0.87 mm) was found between definitive prosthetic loading and 12 months later.
- Peri-implant soft tissue remained stable throughout the observation period.
- The mean Pink Esthetic Score and White Esthetic Score were 12.05 and 8.60, respectively, while the mean Gingival Papilla Index scores were 1.55 at the mesial papilla and 1.65 at the distal papilla at the 1 year follow-up.
- The mean visual analog scale scores for patient perception of the overall process, speech, mastication, and esthetics were 93.3 ± 7.8 , 95.1 ± 5.3 , 93.6 ± 7.6 , and 94.5 ± 6.2 mm, respectively.

Conclusion

For the 1-year results, 3.3-mm-diameter one-piece ceramic implants placed by computer-guided surgery showed favorable clinical performances with no failure when used for single-tooth replacement in anterior regions.

Adapted from C Kunavisarut et al., *Int J Oral Maxillofac Implants Sep/Oct 2020;35(5):965-973*, for more info about this publication, click [HERE](#)

Clin Implant Dent Relat Res 2020 Feb;22(1):29-41.

Risk factors and reoperative survival rate of failed narrow-diameter implants in the maxillary anterior region

G Yang, L Chen, Y Gao, H Liu, H Dong, Y Mou

Study objectives and methods

This study aimed to evaluate the survival/success rate of NDIs in the maxillary anterior region and that of re-implants at the same site, as well as to explore the potential risk factors of original and replaced implants.

From January 2015 to April 2019, patients receiving NDIs in the anterior maxilla were enrolled in the present study. Multiple variables were assessed to exploit the risk factor of failed NDIs, including age, sex, implant sites, length, surface characteristics, and healing abutment designs. The relationship between bone augmentation and the number of missing teeth was assessed. For failed NDIs, the reasons for NDIs removal and marginal bone loss (MBL) were analyzed. The details and outcomes of reimplants were evaluated.

Results

- Cumulative survival rates (CSRs) and success rates of 1095 NDIs installed in 835 patients were 96.99% and 96.51%, respectively.
- In total, 33 of these NDIs failed. TiUnite (TU) surface was a risk factor and it affected the success rate (92.56%) and CSR (92.4%) of NDIs ($P < .001$).
- The single NDIs with bone augmentation have lower failure rate. The average MBL for 33 failed NDIs was 1.92 ± 1.91 mm.
- Additionally, 22 patients with 23 NDIs accepted reimplantation of previously failed NDIs, and the success rate of reimplants was 95.65%.

Conclusion

Surface characteristic (TU surface) was a risk factor for failure of NDIs in the maxillary anterior region. Bone augmentation simultaneously performed during NDIs implantation was favorable for a single missing tooth. As an alternative plan, the reimplantation of failed NDIs was reliable and stable after successful bone reconstruction.

Adapted from G Yang et al., Clin Implant Dent Relat Res 2020 Feb;22(1):29-41, for more info about this publication, click [HERE](#)

J Prosthet Dent.2020 Oct 31; S0022-3913(20)30493-5.

Influences of build angle on the accuracy, printing time, and material consumption of additively manufactured surgical templates

D D Rubayo, K Phasuk, J M Vickery, D Morton, WS Lin

Study objectives and methods

The purpose of this in vitro study was to evaluate the effects of build angle on the accuracy, printing time, and material consumption of additively manufactured surgical templates made with a desktop SLA 3D printer and photopolymerizing resin material.

Fifty surgical templates were fabricated from 1 master digital design file using a desktop SLA 3D printer and photopolymerizing resin material at 5 different build angles (0, 30, 45, 60, and 90 degrees) (n=10). All surgical templates were digitized and superimposed with the master design file using best-fit alignment in the surface matching software program. Dimensional differences between the sample files and the original master design files were compared, and the mean deviations were measured in the root mean square (measured in mm, representing accuracy). The printing time and resin consumption for each specimen were recorded based on the information in the 3D printing preparation software program. ANOVA and the Fisher least significant difference (LSD) test were used to estimate the effects of build angles on the root mean square, printing time, and resin consumption ($\alpha = .05$ for all tests).

Results

- The groups 0 degree (0.048 ± 0.007 mm) and 45 degrees (0.053 ± 0.012 mm) had statistically significant lower root mean square values when compared with those of groups 30 degrees (0.067 ± 0.009 mm), 60 degrees (0.079 ± 0.016 mm), and 90 degrees (0.097 ± 0.017 mm) ($P < .001$ for all comparisons, except $P = .003$ for groups 30 degrees versus 45 degrees).
- The group 90 degrees had statistically significant higher root mean square values than all other groups ($P < .001$ for all comparisons, except $P = .010$ when compared with the group 60 degrees).
- For the printing time, the group 0 degree required significantly less printing time than all other groups (hour:minute, $1:26 \pm 0:03$, $P < .001$ for all comparisons).
- The group 90 degrees required significantly more printing time than all other groups ($2:52 \pm 0:06$, $P < .001$ for all comparisons).
- For resin consumption, the groups 0 degree (11.58 ± 0.21 mL), 30 degrees (11.32 ± 0.16 mL), and 45 degrees (11.23 ± 0.16 mL) consumed similar amounts of resin.
- However, there was statistical significance between groups 0 degree and 45 degrees ($P = .016$). The group 90 degrees consumed the significantly least amount of resin (9.86 ± 0.40 mL, $P < .001$ for all comparisons).

Conclusion

With a desktop SLA 3D printer, the 0-degree and 45-degree build angles produced the most accurate surgical template, and the 90-degree build angle produced the least accurate surgical template.

The 0-degree build angle required the shortest printing time but consumed the most resin in the printing process. The 90-degree build angle required the longest printing time but consumed the least amount of resin in the printing process.

Adapted from D D Rubayo et al., J Prosthet Dent.2020 Oct 31, for more info about this publication, click [HERE](#)

J Clin Periodontol. 2020 Oct 30.

Immediate implant placement with or without connective tissue graft: a systematic review and meta-analysis

L Seyssens, L D Lat, J Cosyn

Study objectives and methods

To assess the effect of connective tissue graft (CTG) in terms of vertical midfacial soft tissue change when applied at the buccal aspect following single immediate implant placement (IIP)

Two independent reviewers conducted an electronic literature search in Pubmed, Web of Science, Embase and Cochrane databases as well as a manual search to identify eligible clinical studies up to January 2020. Randomized Controlled Trials (RCTs) and Non-Randomized Controlled Studies (NRSs) comparing IIP with CTG and without CTG over a mean follow-up of at least 12 months were included for a qualitative analysis. Meta-analyses were performed on data provided by RCTs

Results

- Out of 1814 records, 5 RCTs and 3 NRSs reported on 409 (IIP + CTG: 246, IIP: 163) immediately installed implants with a mean follow-up ranging from 12 to 108 months. Only 1 RCT showed low risk of bias.
- Meta-analysis revealed a significant difference in terms of vertical midfacial soft tissue change between IIP + CTG and IIP pointing to 0.41 mm (95 % CI [0.21; 0.61], $p < 0.001$) in favor of soft tissue grafting.
- This outcome was clinically relevant since the risk for ≥ 1 mm asymmetry in midfacial vertical soft tissue level was 12 times (RR 12.10, 95 % CI [2.57; 56.91], $p = 0.002$) lower following IIP + CTG. Soft tissue grafting also resulted in a trend towards less bleeding on probing (MD 17 %, 95 % CI [- 35 %; 1 %], $p = 0.06$).
- Meta-analyses did not reveal significant differences in terms of pink esthetic score, marginal bone level change and probing depth.
- Results were inconclusive for horizontal midfacial soft tissue change and papilla height change. Based on GRADE guidelines, a moderate recommendation for the use of a CTG following IIP can be made.

Conclusion

CTG contributes to midfacial soft tissue stability following IIP. Therefore, CTG should be considered when elevated risk for midfacial recession is expected in the aesthetic zone (thin gingival biotype, < 0.5 mm buccal bone thickness).

Adapted from L Seyssens et al., J Clin Periodontol. 2020 Oct 30, for more info about this publication, click [HERE](#)

References

C M Meijndert et al., Case Rep Dent 2020 Jul 25;2020:7632692 | M Pietruska et al., Clin Oral Investig 2020 Oct 13 | R A Schallhorn, et al., J Periodontol 2020 Sep 29 | C Kunavisarut et al, Int J Oral Maxillofac Implants Sep/Oct 2020;35(5):965-973 | G Yang. et al., Clin Implant Dent Relat Res 2020 Feb;22(1):29-41 | D D Rubayo et al., J Prosthet Dent.2020 Oct 31 | L Seyssens et al., J Clin Periodontol. 2020 Oct 30 | Source: www.pubmed.gov | Dr. Nair holds a position of Global Scientific Communications Manager at Institute Straumann in Basel, Switzerland.