

Rapporteurs:

Cianna O'Brien, Ioanna Politi, and Eamonn Donohoe
with Lewis Winning and Ioannis Polyzois

Affiliation:

Postgraduate programme in periodontology Dublin Dental
University Hospital, Trinity College Dublin, Ireland

study

Are there added benefits from submarginal instrumentation before surgical management of peri-implantitis?

Authors:

Mario Romandini, Andreina Laforí, Ignacio Pedrinaci, Giacomo Baima, Francesco Ferrarotti, Cristina Lima, Lucrezia Paternó Holtzman, Mario Aimetti, Luca Cordaro, Mariano Sanz

Background

The current treatment pathway for peri-implantitis generally mirrors that of periodontitis. This stepwise approach starts with a behavioural intervention and supragingival instrumentation, followed by non-surgical submarginal instrumentation. Patients are then re-evaluated four to eight weeks after non-surgical instrumentation to determine if the successful treatment endpoints have been achieved.

In moderate to severe forms of peri-implantitis, non-surgical instrumentation alone rarely achieves these endpoints and surgical therapy is often required. It has been suggested that non-surgical instrumentation might be considered as an intermediate preparatory phase before further surgical interventions.

However, the use of non-surgical submarginal instrumentation of implants affected by peri-implantitis may lead to an extended treatment timeline, increased costs, and discomfort for patients. As a result, various authors have questioned its value and opted to use only supragingival instrumentation before surgical treatment.

Aim

To evaluate the added effects of performing non-surgical submarginal instrumentation before the surgical treatment of peri-implantitis.

Materials & methods

- Randomised multi-centre trial with two parallel groups.
- An *a priori* power calculation required a sample of 42 patients.
- Inclusion criteria: any patient, 18 years or older, with at least one implant in function for at least a year and affected by peri-implantitis. Peri-implantitis was defined as: pocket probing depth (PPD) ≥ 6 mm; bleeding on probing (BoP) and/or suppuration on probing (SoP); and radiographic marginal bone loss >3 mm on implants in function for at least a year.
- Exclusion criteria: compromised general health; pregnancy or lactation; chronic use of anti-inflammatory, immune-suppressive, or bone/mucosa-affecting drugs; previous peri-implantitis treatment; and implant mobility.
- Control group: supra- and submarginal instrumentation, local application of 0.12% chlorhexidine + 0.05% cetylpyridinium chloride, followed by surgical therapy six weeks later.
- Test group: supramarginal instrumentation only, followed by surgical therapy two weeks later.
- Clinical measurements (six sites per implant) recorded at baseline, day of surgery, six months, and 12 months:
 - PPD
 - recession
 - BoP
 - SoP
 - keratinized mucosa height (KMH).
- Implant mobility at six and 12 months and presence of profuse BoP at 12 months were also recorded.
- Radiographic marginal bone levels were recorded at two weeks, six months, and 12 months after surgery (digital standardised long-cone intraoral radiographs).
- Primary outcomes:
 - Changes in the deepest PPD with respect to baseline.
 - Various definitions of treatment success criteria were investigated at 12 months (see table).
- Secondary outcomes: total treatment time, early wound healing, self-reported smile aesthetics, surgery difficulty, intra-operative bleeding, and adverse events.
- Patient-level analysis.

Table: Treatment success in the included implants

| | Overall (N = 52) | Control group (N = 28) | Test group (N = 24) | MD/OR (SE) (only adjusted for clustering) | MD/OR (SE) (adjusted for clustering and surgical approach) |
|--|------------------|------------------------|---------------------|--|---|
| Criterion 1: No implant loss, no bone loss >0.5mm, BoP/SoP, PPD ≤5mm, N (%) | | | | | |
| 6 months | 6 [11.8] | 4 [14.3] | 2 (8.7) | NE | NE |
| 1 year | 14 [26.9] | 6 [21.4] | 8 [33.3] | OR = 1.83 [1.16] <i>p</i> = .338 | OR = 2.09 [1.38] <i>p</i> = .264 |
| Criterion 2: No implant loss, no bone loss >0.5mm, BoP/SoP, N (%) | | | | | |
| 6 months | 6 [11.8] | 4 [14.3] | 2 (8.7) | NE | NE |
| 1 year | 14 [26.9] | 6 [21.4] | 8 [33.3] | OR = 1.83 [1.16] <i>p</i> = .338 | OR = 2.09 [1.38] <i>p</i> = .264 |
| Criterion 3: No implant loss, no bone loss >0.5mm, no PPD ≥5 with concomitant BoP/SoP+, N (%) | | | | | |
| 6 months | 33 [64.7] | 20 [71.4] | 13 [56.5] | OR = 0.52 [0.31] <i>p</i> = .271 | OR = 0.57 [0.35] <i>p</i> = .360 |
| 1 year | 27 [51.9] | 17 [60.7] | 10 [41.7] | OR = 0.46 [0.26] <i>p</i> = .173 | OR = 0.52 [0.30] <i>p</i> = .256 |
| Criterion 4: No implant loss, no bone loss >0.5mm, BoP+ at maximum one site, no SoP, PPD ≤5mm, N (%) | | | | | |
| 6 months | 18 [35.3] | 8 [28.6] | 10 [43.5] | OR = 2.14 [2.01] <i>p</i> = .417 | OR = 2.35 [2.31] <i>p</i> = .384 |
| 1 year | 17 [32.7] | 7 [25.0] | 10 [41.7] | OR = 2.14 [1.29] <i>p</i> = .205 | OR = 2.19 [1.36] <i>p</i> = .205 |
| Criterion 5: No implant loss, no bone loss >0.5mm, no profuse bleeding, no SoP, PPD ≤5mm, N (%) | | | | | |
| 1 year | 24 [46.2] | 13 [46.4] | 11 [45.8] | OR = 0.98 [0.55] <i>p</i> = .966 | OR = 0.99 [0.57] <i>p</i> = .989 |

Note: One six-months radiograph from the test group resulted unreadable, reducing in this group the sample size to 23 implants for treatment success outcomes.

Abbreviations: BoP, bleeding on probing; MD, difference in means; NE, not estimable; OR, odds ratio; PPD, probing pocket depth; SoP, suppuration on probing.

Results

- Study population group: 21 patients per treatment group (control = 29 implants, test = 24 implants, *n* = 53), 61.9% female, mean age 61.36 years (SD ± 12.27 years), mean baseline bone level of 4.96mm (± 1.65mm).
- One implant in one patient from the test group was removed; one patient from the control group was lost to follow-up after the two-week examination.
- The overall change in deepest PPD at 12 months was 3.03mm (± 1.96mm) with 2.96mm (± 1.85mm) in the control group and 3.11mm (± 1.12mm) in the test group. These differences were not statistically significant.
- Treatment success (no implant loss, no bone loss >0.5mm, BoP/SoP and PPD ≤ 5mm) was achieved in 26.9% of all study implants, with marginally better but not statistically significant results for the test group (33.3% test vs 21.4% control).
- Radiographic examination at 12 months demonstrated that 12.0% of the implants presented with bone loss >0.5mm (OR = 1.04; SE = 1.13; *p* = .97), while 60.0% of the implants presented a bone gain >0.5mm (OR = 1.49; SE = 3.88; *p* = .88).
- No statistically significant differences were observed for early wound healing, self-reported smile aesthetics, surgery difficulty, intraoperative bleeding, and adverse events.
- The duration of non-surgical treatment was longer in the control group. However, when considering total treatment time there was no statistically significant difference between groups.

Limitations

- The observed standard deviation (SD) for PPD changes was higher than the SD used when the sample size calculation was performed, which means that the study was underpowered.
- Lack of blinding of non-surgical operators and patients regarding their treatment group.
- The type of surgical therapy was not standardised.
- Variable levels of operator experience.
- Adjunctive local antimicrobial therapy was used only in the control group.
- Only limited patient-reported outcomes were recorded. No cost-benefit analysis was carried out.

Conclusions & impact

- No added benefit was demonstrated in performing submarginal instrumentation six weeks before the surgical treatment of peri-implantitis.
- Overall findings regarding the clinical parameters included a PPD reduction of approximately 3mm and a recession reduction of approximately 2mm.
- No definitive conclusion can be reported regarding the discomfort experienced by patients undergoing additional submarginal instrumentation before the surgical management of peri-implantitis.
- Further studies with a larger population are required.
- Patient discomfort, treatment duration, and costs can potentially be reduced by avoiding submarginal instrumentation in the management of peri-implantitis before surgical therapy.



JCP Digest 108 is a summary of 'Effect of sub-marginal instrumentation before surgical treatment of peri-implantitis: a multi-centre randomized clinical trial.' *J Clin Periodontol.* 49(12):1334-1345. DOI: 10.1111/jcpe.13713



<https://www.onlinelibrary.wiley.com/doi/10.1111/jcpe.13713>



Access through EFP members' page log-in: <http://efp.org/members/jcp.php>