PTT577

Treatment of mild peri-implantitis using a novel chitosan device - a multicenter consecutive case series

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Topic: Treatment of technical and biological complications

Background

Inflammation and loss of attachment around dental implants (i.e., peri-implantitis) is a common clinical problem within the field of dental implantology.[1] Regular maintenance of dental implants will reduce the risk for progression of mucositis to peri-implantitis.[2] Devices specifically designed for this purpose are however scarce and rarely scientifically validated with respect to effectiveness and safety. It has also been reported that remnants of a cleaning device left in the peri-implant crevice or nicking the implant surface with a metal tip may lead to suboptimal healing and potentially induce a foreign body reaction.[3, 4] The brush bristles of the device in this study are made of chitosan which is a completely biocompatible marine biopolymer. The safety and potential to reduce peri-implant inflammation of the device has previously been demonstrated in one efficacy randomized clinical trial on peri-implant mucositis.[5]

Aim and Null Hypothesis

In this clinical study the aim was to evaluate a chitosan brush for treatment of dental implants with mild peri-implantitis. The null hypothesis was that there will be no significant difference in reduction in parameters of peri-implant inflammation after debridement with a chitosan brush neither at two weeks, four weeks, 12 weeks nor 24 weeks post therapy compared to baseline.

Methods and Materials

This was a multicenter prospective consecutive case series of six months duration performed in six different periodontist specialist centers in Norway, Sweden and Italy. In total 67 implants in 67 patients were finally included. Patient screening, inclusion, all clinical treatments as well as examinations were performed by a specialist in periodontology at each center. Prior to study initiation ethical approval was obtained by the regional ethical review board for each center. Subjects were included in the study if diagnosed with mild peri-implantitis defined as 1-2 mm bone loss, pocket probing depth (PPD) ≥4mm and a positive Bleeding on Probing (mBoP) score. Patients diagnosed with periodontitis were treated and the disease had to be in a state of reminiscence prior to inclusion in the study. Patients should have a total plaque score (dichotomous scoring) below 20% of surfaces prior to inclusion and baseline measurements. Clinical examinations were performed at baseline and at two, four, 12 and 24 weeks after baseline using a 0.20 N (20 g) defined force periodontal probe (University of North Carolina, DB764R, AESCULAP, B Braun Germany). Radiographs were taken at baseline and at three and six months after therapy. The implant pockets were debrided at baseline and at three months with a chitosan brush (LBC, BioClean®, LABRIDA AS, Oslo, Norway) in an oscillating dental handpiece (ER10M, TEQ-Y, NSK Inc., Kanuma Tochigi, Japan) for three minutes and then irrigated with sterile saline. Differences in clinical findings between baseline and the follow up visits were analyzed using Mann-Whitney Rank Sum Test test at an alpha level of 0.05.

mBoP:
Score 0: No bleeding 30 seconds after probing
Score I: Isolated minimal bleeding spots visible 30 seconds after probing
Score 2: Blood forms a confluent red line on margin 30 seconds after probing.
Score 3: Heavy or profuse bleeding 30 seconds after probing

Financial disclosure
Dr Wohlfahrt is inventor and patentholder of BioClean® and is a shareholder in LABRIDA AS (www.labrida.com). The study was funded by a grant from the Norwegian Research Council ForNy Study number 23452.

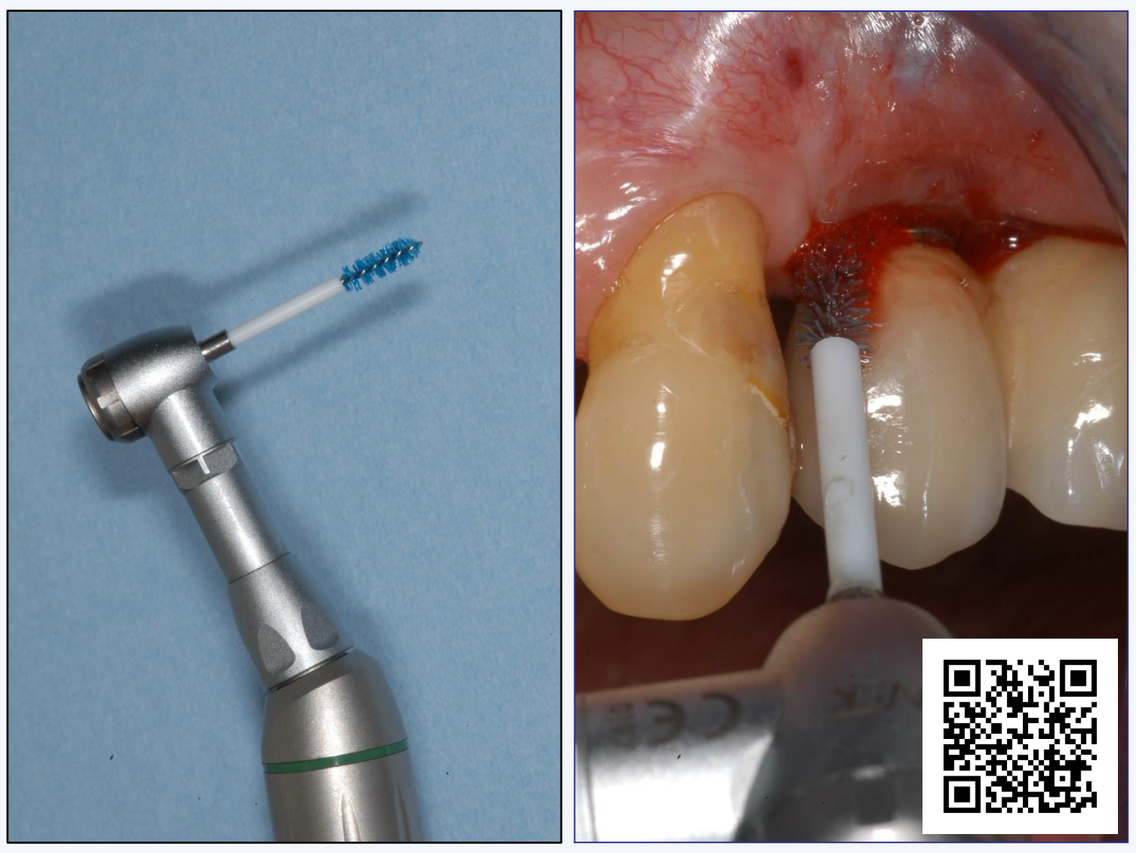

Fig. 1. A chitosan brush (LBC, BioClean® , LABRIDA AS) used in an oscillating dental handpiece. Please scan QR code for clinical movie.

Results

A statistical significant reduction in both PPD and mBoP were seen at all timepoints as compared with the baseline clinical measurements (p <0.001). The mean PPD and mBoP at baseline were 5.1 mm and 1.8, whereas the mean PPD and mBoP at six months were 4.0 mm and 0.6 respectively (Fig. 2 and 3). Stable reductions in PPD and mBoP were demonstrated after two weeks and up to six months after the initial treatment. A reduction in PPD and mBoP at three months, were recorded in 72.5% and 76.1% of sites respectively. During the course of the study none of the 67 implants treated lost peri-implant osseous support as seen on radiographs.

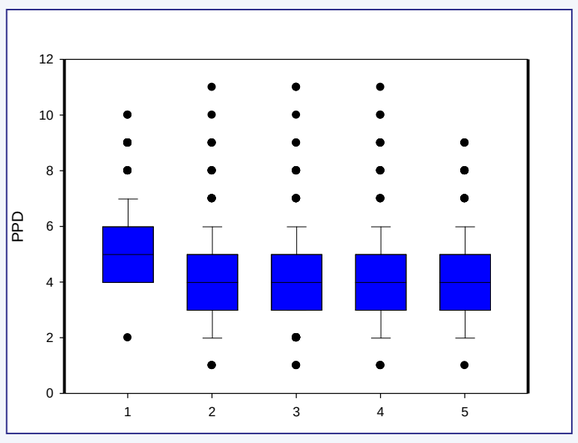

Fig. 2. PPD, 1 : Baseline, 2: 2 weeks, 3: 4 weeks, 4: 12 weeks, 5: 24 weeks

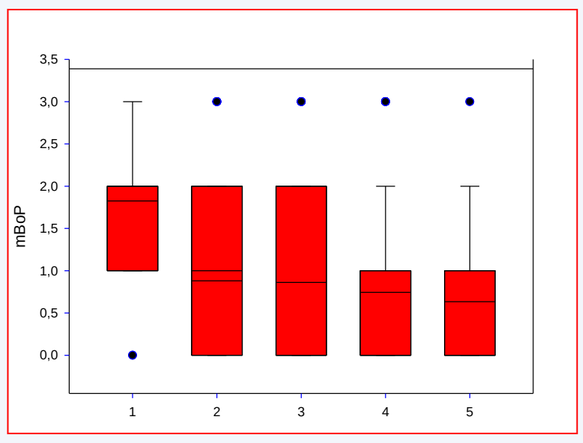

Fig. 3. mBoP, 1 : Baseline, 2: 2 weeks, 3: 4 weeks, 4: 12 weeks, 5: 24 weeks

Conclusions

In this case series on implants affected by mild peri-implantitis significant reductions in clinical parameters of inflammation were demonstrated at all time points after the initial treatment with LBC. The use of an oscillating chitosan brush seems to be a safe and efficient method for treatment of mild peri-implantits and for maintenance of dental implants. A randomized clinical trial will be undertaken to further explore these findings.

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