

RAPPORTEURS

Emma Busoms, Fabiola Dell'Olmo, and Joan Takamoli, with Prof José Nart

AFFILIATION

Residents of the Postgraduate Programme in Periodontology, International University of Catalonia, Barcelona, Spain

study

Bone regeneration versus connective-tissue graft

Thomas De Bruyckere, Célien Eeckhout, Aryan Eghbali, Faris Younes, Paulien Vandekerckhove, Roberto Cleymaet, Jan Cosyn
J Clin Periodontol. 2018; 45:1375-1387.

Summarised from original article, "A randomised controlled study comparing bone regeneration with connective-tissue graft to re-establish convexity at the buccal aspect of single implants: a one-year CBCT analysis," with kind permission from Wiley Online Library

Copyright © 1999-2019 John Wiley & Sons, Inc. All Rights Reserved.

JCP Digest 11, published by the EFP in March 2019.

RELEVANT BACKGROUND

After tooth extraction, the alveolar process undergoes dimensional changes, even when ridge preservation is performed. The area that is most affected by these changes is the central aspect of the buccal bone. Consequently, after tooth extraction there will be a lack of volume and buccal convexity, possibly compromising the aesthetic outcome.

Procedures such as guided bone regeneration (GBR) or connective tissue graft (CTG) have been suggested to be effective in re-establishing sufficient tissue thickness and height before performing single implant placement.

Only one randomised controlled clinical trial (RCT) has previously been published comparing GBR and CTG to re-establish buccal convexity at single implants, and this showed no significant differences between the two approaches after one year.

AIMS

To compare GBR with CTG simultaneous with implant placement to restore the buccal convexity of single tooth gaps, over a one-year period.

MATERIALS AND METHODS

This study was a single-blind RCT, involving a total of 42 patients presenting:

- A single tooth gap in the anterior maxilla with adjacent teeth present;
- Tooth missing for at least three months;
- Class I defect (Seibert 1983);
- At least 6mm of buccopalatal bone dimension at the site of the tooth gap.

In the GBR group, the buccal concavity was augmented after implant placement with bovine-derived xenograft particles and covered with a resorbable collagen membrane. In the CTG group, the graft harvested from the palatal premolar area by means of the single-incision technique was placed. After three months, implants were uncovered and healing abutments were placed in both groups.

A screw-retained provisional crown was fabricated with a concave profile and the emergence profile was modified during the following three months, adding flowable composite to enhance the mid-facial soft-tissue level. Six months after the implant placement, a definitive crown was made which replicated the emergence profile.

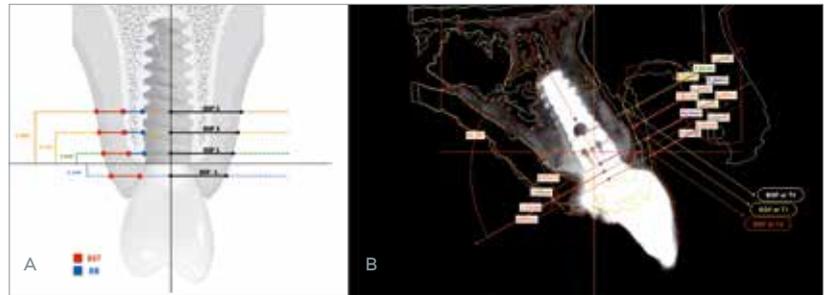
Cone beam computer tomography (CBCT) was performed at: t0 (before surgery), t1 (two weeks after surgery), t2 (one year after surgery). Cross-sectional images were used to analyse the buccal soft-tissue profile (BSP) as the primary outcome. Buccal bone thickness, buccal soft-tissue thickness, and vertical bone loss were also assessed.

The clinical outcomes recorded were: survival rate, success and complications, marginal bone loss, probing depths, plaque and bleeding on probing, and mid-facial and papillary recession.

Categorical variables across groups were analysed using Fisher's exact test. Repeated-measures analysis of variance (ANOVA) was used to examine the changes over time within each group and the impact of the treatment strategy.

A | Illustration showing how the buccal soft-tissue profile (BSP), buccal bone thickness (BB), and buccal soft-tissue thickness (BST) were measured on CBCT images at four different levels from the implant platform.

B | measurements of BSP at four different levels on the superimposed CBCT images at t0 (white), t1 (yellow), and t2 (red).



results

- No statistically significant differences between groups were observed in terms of buccal defect, which was 0.98mm in the GBR group and 0.90 in the CTG group.
- After one year, in the GBR group, 1.38mm out of 2.16mm of immediate tissue gain could be maintained at 1mm coronal to the implant platform, while in the CTG group the figures were 1.52mm out of 1.72mm.
- Apical to the implant shoulder, the BSP gain ranged from 0.77mm to 1.5mm in the GBR group, and from 0.41mm to 0.81mm in the CTG group, the result being statistically not significant.
- In terms of clinical parameters, there were no statistically significant differences between the groups.



LIMITATIONS

- Short follow-up (one year).
- The CTG was harvested from the premolar palatal area and not from the tuberosity, which might be the treatment of choice.
- Lack of standardisation in the quantity of materials used to graft.
- Patient-reported outcomes and surgery cost-effectiveness were not assessed.
- Scarce visibility of soft tissue in the CBCT.
- 2D images from 3D images were used to assess BSP instead of a true volumetric analysis.



CONCLUSIONS

- At one year, there were no statistically significant differences between using CTG or GBR to restore buccal convexity or volume at single implants in the aesthetic area.



IMPACT

- GBR or CTG can be considered as good alternatives to reconstruct the convexity at the buccal aspect of single implants.



LINK TO ORIGINAL JCP ARTICLE:

<https://www.onlinelibrary.wiley.com/doi/full/10.1111/jcpe.13006>

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