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Case Report

Simplified Technique for Obtaining Autologous Block Graft: A Case Report

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Abstract

Predictability and prognosis in dental implants are transcendental topics in good planning and final results. The planning of bone regeneration acquires great importance. The block graft, although it improves the quality and bone volume predictably, is difficult and generally requires a second surgical wound, making surgery more difficult and generating greater postoperative discomfort in the patient. In the following case, a variant of the classic block graft technique is described to simplify it, using only one surgical wound. Furthermore, it allows to optimize the surgical and prosthetic times, requiring only two surgical times, with a good prognosis and predictable in time. Seven months after the first surgery, a good bone ridge and an optimal emergence profile were obtained to perform the single fixed prosthesis on implants.

Keywords: Alveolar Ridge Augmentation; Bone Resorption; Bone Transplantation; Dental Implantation; Khoury Technique; Autogenous Bone Graft

Introduction

Predictability and prognosis in dental implants are transcendental topics in good planning and final results. The three-dimensional position of the implant, the quality and quantity of bone, and the condition of the peri-implant soft tissue have been shown to influence directly the prognosis and predictability. For these reasons, the planning of bone regeneration acquires great importance and, indirectly, allows prosthetic guided implant placement, since it provides greater safety and availability of tissue for the surgical site [1-3].

It is also relevant that the implant is completely surrounded by native bone and a peri-implant soft tissue capable of maintaining stability and peripheral prosthetic sealing. These objectives are achievable with greater predictability, by previously studying the bone defect, choosing the best possible surgical technique on a case-by-case basis [4].

Among the different bone regeneration techniques described in the literature, the one that achieves the greatest gain in the horizontal direction and is most predictable is the use of Block grafts, which should ideally be Autologous [2,5,6].

The block graft, although it improves the quality and bone volume predictably, is difficult and generally requires a second surgical wound, making surgery more difficult and generating greater postoperative discomfort in the patient [5].

In the following case, a variant of the classic block graft technique is described to simplify it, using only one surgical wound. Furthermore, it allows to optimize the surgical and prosthetic times, requiring only two surgical times, with a good prognosis and predictable in time [7].

Case Description

The case is about a 65-year-old patient, with no relevant morbid history, non-smoker, who presented severe atrophy of the alveolar ridge in the horizontal direction (Seibert I defect) and compromised periodontal tissue from neighboring pieces in the area of piece 4.6, extracted 25 years ago (Figure 1). In this area, simply placing the implant in a prosthetically guided position would leave the implant absolutely dehiscent with exposure of its threads. Classically, one could choose to carry out a first regenerative surgery, waiting for the regeneration time according to the technique and biomaterial used, and in a second instance, perform the placement of the indicated implant, increasing surgical costs and times with its consequent difficulties.

In this case, regeneration was planned at the expense of a block graft. Clinical and imaging was decided to obtain it from the

Figure 1: Previous clinical view.

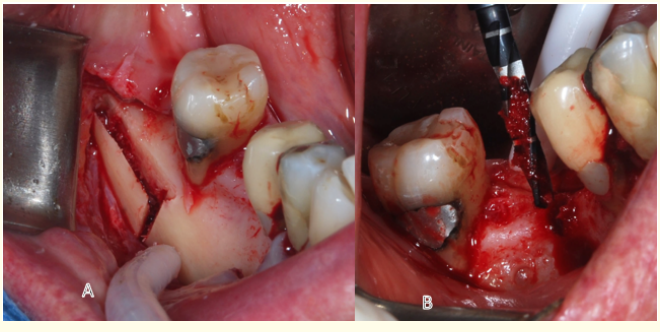

Figure 2: Obtaining block graft (A) and particulate bone from the same surgical drilling (B) and bone Scrapers.

mandibular branch at the level of the external oblique line on the same side. To simplify the technique and avoid a second surgical wound, a distal donor site as close as possible to the surgical site was sought, extending the same flap. With the removal of the block, greater freedom was also obtained from the flap towards the vestibular (Figure 2). Once the piezoelectric osteotomy has been performed, the Autologous Block is dislocated and extracted for subsequent adaptation to the defect to be regenerated. With a bone scraper, particulate bone is extracted from the same area of the donor site of the block and the particulate bone obtained from the surgical site area is also used after the decortication of the defect prior to implantation.

The implant placement is prosthetically guided through a surgical guide and is performed prior to the placement of the block. Once the implant has been placed, we continue to place the block covering the implant. For this, to the classic block fixation technique, the creation of an anteroposterior groove with piezoelectric is added, which allows the graft to settle, making it more stable and facilitating its fixation with two osteosynthesis screws previously chosen in the case study (Figure 3 and 4). The space between the Implant and the Vestibular cortex, called the Biological Box, is exclusively filled with the autologous bone particles obtained from the donor site previously. The surgical site is covered with L-PRF membranes and wound closure is performed without tension with a horizontal mattress and continuous suture.

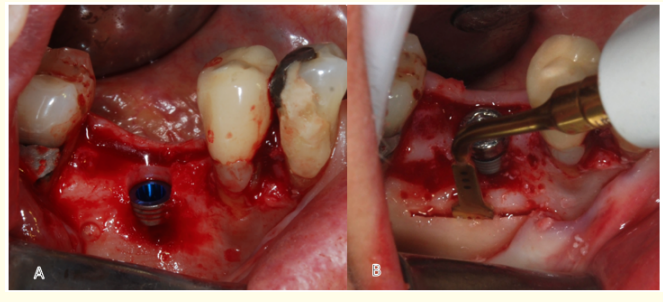

Figure 3: Prothetically guided implant placement (A)whit vestibular dehiscence and stabilizing groove (B).

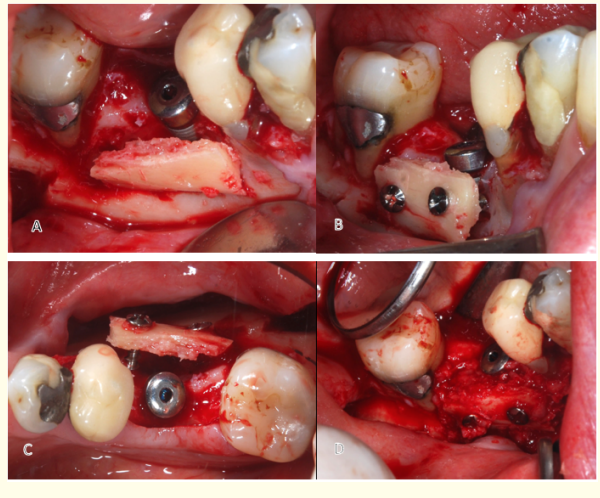

Figure 4: Lateral (A, B) and occlusal (C) view of the stabilization and fixation of the autologous block, according to the Khoury technique, creating a Biological Box, which is filled whit the autologous bone (D).

It is radiographically controlled prior to the second surgical phase, observing bone gain and correct implant position (Figure 5). At 4 months, perform the second surgical phase to remove the osteosynthesis screws and implant connection. At this stage, mucogingival surgery is planned with a connective tissue graft of the tuberosity which adapts to a new, heavier healing abutment than that installed in the first surgery, improving the gingival contour and gingival phenotype to improve the future emergence profile and peripheral sealing of the prosthesis on implants (Figure 6). After three weeks, the provisionalization period begins with a provisional crown to manage the emergency profile (Figure 7).

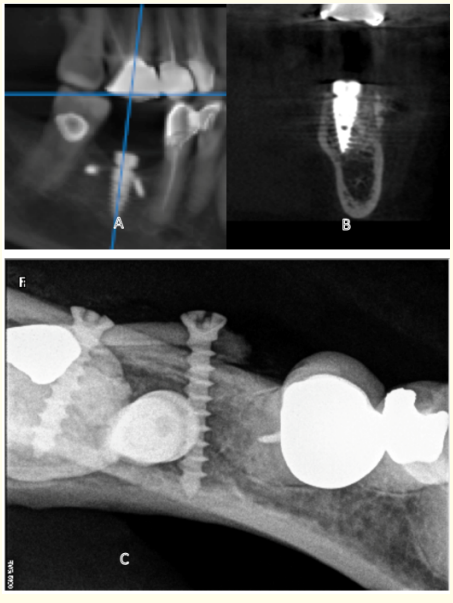

Figure 5: Control tomography image (A, B), 4 months after surgery, and occlusal radiography (C), prior to the second surgical phase.

Finally, 7 months after the first surgery, a good bone ridge and an optimal emergence profile were obtained to perform the single fixed prosthesis on implants (Figure 8).

Discussion

The simplification in obtaining an autologous block graft as a result of the extension of the first surgical wound facilitates the obtaining of the graft, and allows its use to be improved, improving the patient's adaptation during the postoperative period.

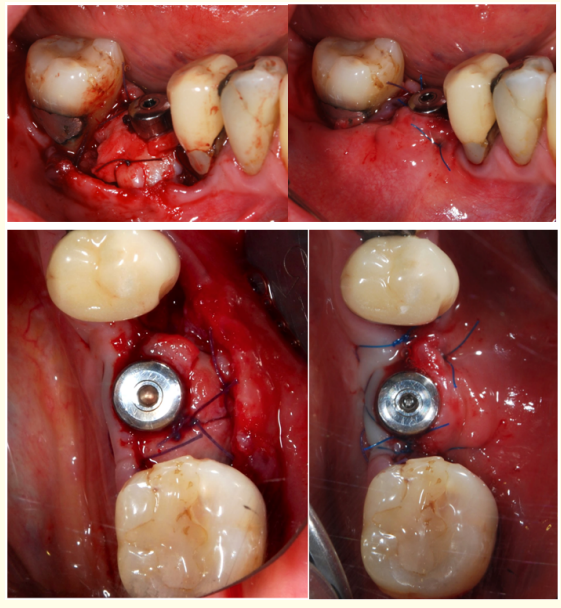

Figure 6: Second surgical phase, connective tissue grafting from the tuberosity.

Figure 7: Emergency profile, provisional tooth 4.6.

Using autologous regeneration materials improves predictability and prognosis, aspects that are reinforced with the use of block grafts and L-RPF membranes. In addition to the fact that the patient is the source of the regeneration resources, it allows reducing costs and dispensing with biomaterials such as collagen membranes and allogeneic particulate bone [8,9].

Figure 8: Fixed prosthesis on implant.

By using block grafts and filling the spaces with autologous particulate bone, minimal dimensional changes are achieved over time, improving the possibilities of prosthetically guiding the three-dimensional position of the implant. The use of blocks allows the design of biological boxes that improve the predictability of bone regenerations, increasing the number of walls, stabilizing and better occluding the clot of the site to regenerate [7,10].

Through the use of connective tissue grafts and the management of emergency profiles by means of provisionals, it is possible to have a peri-implant tissue of greater thickness and quality, improving the prognosis and predictability of the final result, which not only benefits the peri-implant tissues, but also the periodontium of the neighboring pieces [11-13].

Conclusion

In cases of atrophic ridge, the use of block grafts and autologous particulate bone improves the predictability and prognosis of regenerations. Using a primary wound flap extension to remove the autologous block could be a technique that improves the postoperative period of patients and simplifies the technique for the operator. The preparation of biological boxes through block grafts allows to improve the predictability and prognosis of bone tissue grafts. The use of autologous block grafts and particulate bone from the same patient reduces costs and makes it possible to dispense with certain biomaterials. This simplified technique could be a good alternative to obtain block grafts.

Acknowledgements

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Conflict of Interest

The authors declare having no financial interest or any conflict of interest with this case report.

Bibliography

1. Buser D, Martin W, Belser UC. Optimizing esthetics for implant restorations in the anterior maxilla: anatomic and surgical considerations. The International journal of oral & maxillofacial implants. 2004;19:43-61.

2. Clementini M, Morlupi A, Canullo L, Agrestini C, Barlattani A. Success rate of dental implants inserted in horizontal and vertical guided bone regenerated areas: a systematic review. International journal of oral and maxillofacial surgery. 2012;41(7):847-852.

3. Singh R, Parihar AS, Vaibhav V, Kumar K, Singh R, Jerry JJ. A 10 years retrospective study of assessment of prevalence and risk factors of dental implants failures. J Family Med Prim Care. 2020;9(3):1617-1619.

4. Shi JY, Gu YX, Zhuang LF, Lai HC. Survival of Implants Using the Osteotome Technique with or Without Grafting in the Posterior Maxilla: A Systematic Review. The International journal of oral and maxillofacial implants. 2016;31(5):1077-1088.

5. Khoury F, Hanser T. Three-Dimensional Vertical Alveolar Ridge Augmentation in the Posterior Maxilla: A 10-year Clinical Study. The International journal of oral and maxillofacial implants. 2019;34(2):471-480.

6. Urban IA, Monje A, Lozada JL, Wang HL. Long-term Evaluation of Peri-implant Bone Level after Reconstruction of Severely Atrophic Edentulous Maxilla via Vertical and Horizontal Guided Bone Regeneration in Combination with Sinus Augmentation: A Case Series with 1 to 15 Years of Loading. Clinical implant dentistry and related research. 2017;19(1):46-55.

7. Tang YL, Yuan J, Song YL, Ma W, Chao X, Li DH. Ridge expansion alone or in combination with guided bone regeneration to facilitate implant placement in narrow alveolar ridges: a retrospective study. Clinical oral implants research. 2015;26(2):204-211.

8. Aghaloo TL, Moy PK. Which hard tissue augmentation techniques are the most successful in furnishing bony support for implant placement? The International journal of oral & maxillofacial implants. 2007;22:49-70.

9. Temmerman A, Cleeren GJ, Castro AB, Teughels W, Quirynen M. L-PRF for increasing the width of keratinized mucosa around implants: A split-mouth, randomized, controlled pilot clinical trial. Journal of periodontal research. 2018;53(5):793-800.

10. Steigmann M, Salama, M, Wang HL. Periosteal pocket flap for horizontal bone regeneration: a case series. The International journal of periodontics & restorative dentistry. 2012;32(3):311-320.

11. Bassetti RG, Stähli A, Bassetti MA, Sculean A. Soft tissue augmentation around osseointegrated and uncovered dental implants: a systematic review. Clinical oral investigations. 2017;21(1):53-70.

12. Thoma DS, Buranawat B, Hämmerle CH, Held U, Jung RE. Efficacy of soft tissue augmentation around dental implants and in partially edentulous areas: a systematic review. Journal of clinical periodontology. 2014;41(15):S77-S91.

13. Bassetti RG, Stähli A, Bassetti MA, Sculean A. Soft tissue augmentation procedures at second-stage surgery: a systematic review. Clinical oral investigations. 2016;20(7):1369-1387.

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