



Case Report

THE VERSATILITY OF REGENERATION THROUGH ATROPHIC RIDGES OF ABSORBABLE CURVED CORTICAL LAMINAE: SURGICAL TECHNIQUES

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ABSTRACT

In regenerative surgery, patients with severe bone atrophy are often forced to operate due to site infections, severe periodontitis and peri-implantitis. Therefore, the need to have versatile techniques becomes essential to solve complex cases in which it is necessary to obtain graft stability, even in complex sites. In this work, a technique is proposed that uses of a curved heterologous cortical lamina which has the characteristic of adapting to the defect and reaching the two mesial and distal peaks containing a graft of pre-hydrated and collagenated granules which will subsequently be reabsorbed and turned into bone. The excellent vascularization of the graft combined with the integration of the lamina that must not be removed allows us to propose this technique as a potential alternative to those used.

KEYWORDS: *bone, atrophy, regenerative surgery, implant*

INTRODUCTION

The development of an increasingly predictable implantology associated with the lengthening of patients' average life makes it necessary to place dental implants for prosthetic purposes, even in areas with severe atrophy. However, managing free distal saddles is challenging, especially in the mandibles.

Numerous techniques are proposed to increase both horizontally and vertically the mandibular bone for implant purposes. However, autologous and heterologous blocks have often been used with extreme difficulty. In the case of autologous blocks, it is necessary to perform two operations, one in a donor site and the second in the recipient site; this

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determines considerable patient discomfort and increases the operation's morbidity. In the case of heterologous blocks, it is possible to use dehydrated bone blocks that must be rehydrated in place and fixed with synthetic peans so that the graft is completely stable (1-18).

The vascularization of the block itself, once inserted and fixed in place, remains a key element for the success of the procedure; if the vascular bed is not sufficient and the fixity of the block is not perfect, there is a risk of necrosis of the block itself (19-20).

In this work, a technique is proposed that makes use of a curved heterologous cortical lamina which has the characteristic of adapting very well to the defect and reaching the two mesial and distal peaks containing a graft of pre-hydrated and collagenated granules which will subsequently be reabsorbed and turned into bone (Lamina, MP3, Osteobiol Roen, Turin, Italy) (21-26).

Description of the surgical technique

A 64-year-old patient who presented with severe atrophy in the lower incisal area due to implant failure performed a bone regeneration to obtain sufficient bone quantity to insert two implants on 31 and 41.

The patient presented for our observation with severe atrophy of sites 31 and 41 due to implant failure. She was wearing a removable provisional.

During the first phase, a wide flap was prepared to extend up to the right and left canines, on which a relief cut was made on the mesial third. Next, a centre-crystal incision was made. Once the site was skeletonized, the fibrous residues were removed. The site showed a two-walled bone loss in which the buccal and lingual wall was missing and reduced vertical and horizontal dimension. The bone crest was 9 millimetres horizontally, while vertically, there was a deficit of 7 millimetres buccally and 3 lingually (Fig. 1a, b).

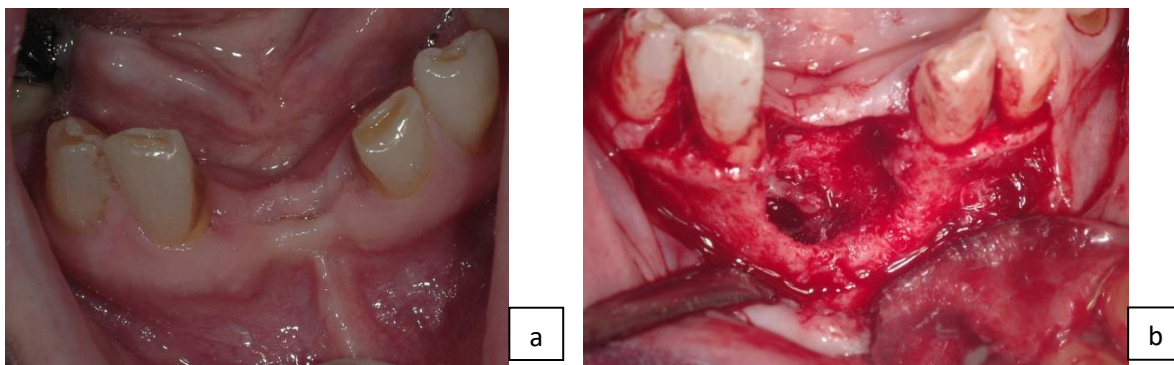


Fig. 1. a, b): Presurgical site.

The necessary requirements for implementing the technique are the stability of the lamina and the presence of bone peaks mesial and distal to the defect. Therefore, a curved heterologous cortical plate 1 mm in size and with a soft consistency was suitably shaped in order to cover the bone defect between the mesial peaks of 32 and 42 to create a containment site that could be filled with pre-hydrated and collagenated porcine origin subsequently reabsorbed and transformed into bone, (Lamina, MP3, Osteobiol Roen, Turin, Italy) (Fig. 2). The pre-hydrated and collagenated granules cover entirely the site (Fig. 3a, b, c).

The lamina was fixed through a resorbable cortical pin (Roen, Turin, Italy) on the apical part of the vestibular crest and included the mesial and distal bone spike to the defect. The return time was six months since it is required for bone remodelling inside the box. However, upon re-entry, it was possible to see newly formed bone and the complete integration of the inserted lamina (Fig. 4). Two implants were placed (Adapta, FMD, Rome, Italy), which were prosthetically rehabilitated 3 months later (Fig. 5, 6).

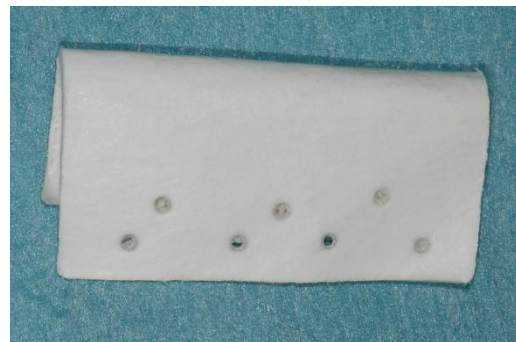


Fig. 2. Heterologous curved lamina.

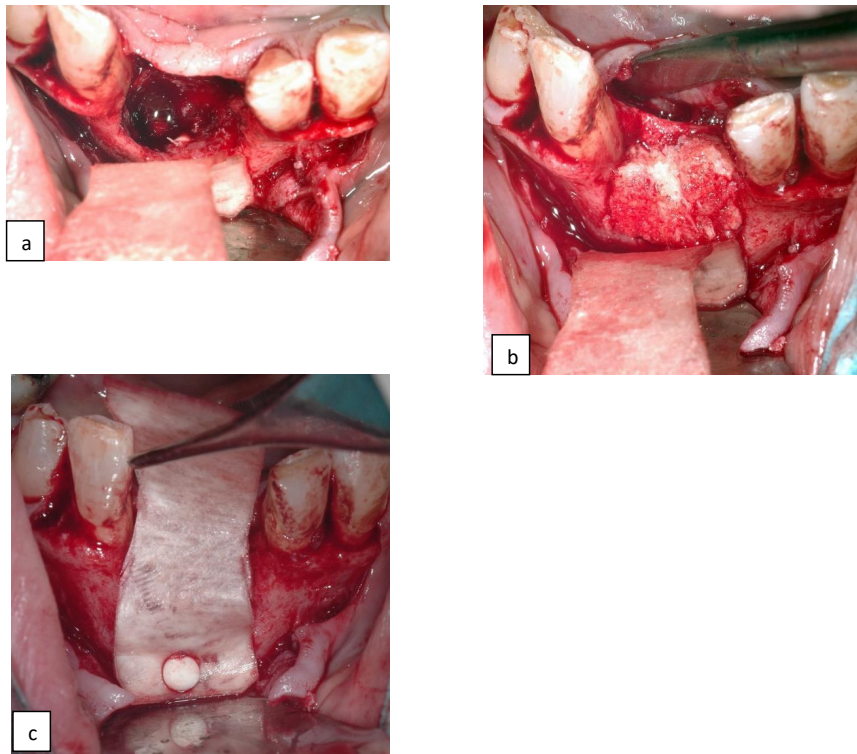


Fig. 3. a, b, c): a surgical site filled with granules and covered with shaped heterologous curved amine.



Fig. 4. Surgical site after six months with newly formed bone



Fig. 5. Definitive prosthesis after three months from the overlap.

DISCUSSION

Among the numerous techniques used up to now for horizontal and vertical bone regeneration, the one that involves curved heterologous cortical plates seems to show a high versatility and can also be used in complex cases where it is difficult to stabilize the graft with conventional techniques.

The lamina has the characteristic of adapting very well to the defect and reaching the two peaks creating a containment site that can be filled with pre-hydrated and collagenated granules of porcine origin (Lamina, MP3, Osteobiol Roen, Turin, Italy). Furthermore, it is easy to use since it is elastic and induces the formation of high quality bone because adaptation on mandible shape lets blood vessels trigger the transformation of granules into bone capable of supporting dental fixtures. In a previous report, we

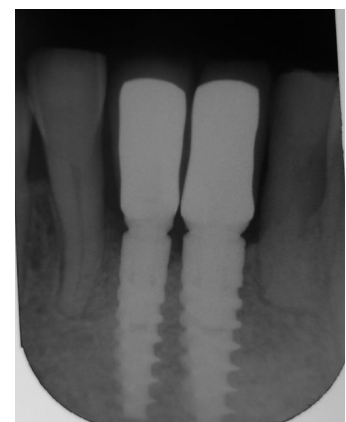


Fig 6 Final RX check

proposed a surgical technique that uses resorbable cortical lamina to create recipient sites that can be filled with pre-hydrated and collagenated granules covered by mesenchymal resorbable membranes (27). We demonstrated with this technique a good vascularization of the graft and the integration of the lamina, which do not need to be removed.

CONCLUSIONS

Based on our experience, curved heterologous cortical plates can represent a valid alternative to those commonly used. However, further clinical and histological work is needed to validate the technique further.

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Conflict of Interest

The authors declare no conflict of interest.

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