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Case Report

Alveolar Ridge Split: A Minimally Invasive Alternative

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Abstract

Often we are faced with the challenge of rehabilitating atrophied jaws, especially in aesthetic areas. The dimensions of the ridge, in such cases, will need an additional procedure to be able to arrive at a successful rehabilitation. In fact, we can say that the most aesthetic is the zone to rehabilitate, the more critical it becomes.

Taking into account this simple technique, we can offer a relatively fast and atraumatic alternative to our patients.

Keywords: *Alveolar Ridge Split; Rehabilitation; Invasive Techniques*

Introduction

The treatment of patients with atrophic ridges who need prosthetic rehabilitation is a common problem in oral and maxillofacial surgery. Often we are faced with the challenge of rehabilitating atrophied jaws, especially in aesthetic areas. The dimensions of the ridge, in such cases, will need an additional procedure to be able to arrive at a successful rehabilitation. In fact, we can say that the most aesthetic is the zone to rehabilitate, the more critical it becomes. To achieve this, the implant must be placed with a prosthetically sight. Numerous techniques have been described over the years: Auto and block grafts, GBR whit or without membranes; but drawbacks do exists. First of all because these are invasive techniques that need an additional donor site, and after the maneuver the grafts can resorb, the membrane can collapse and be exposed to the buccal environment, leading to infection and delaying the treatment.

Such traumatic techniques in some cases may be not necessary. In horizontal moderate defects a less invasive technique can be carried out, without much trauma to the patient. An alveolar ridge split and bone expansion technique of the ridge is a viable option.

We are aware that after a dental extraction the bone will be resorb due to the lack of loads over it, as the Wolff's law says. This resorption can reach up to the half of the original socket width, which entails a difficulty at the moment in which we place the implants.

The original technique was first described by Tatum in 1986 and involved the splitting of the alveolar ridge in 2 parts using hand instruments (osteotomes and chisels). But along the years the modifications implies the using of rotating instruments, saws or ultrasonic devices.

The technique implies an osteotomy over the alveolar ridge, using hand, rotating or ultrasonic instruments. Then a controlled greenstick fracture is done and the alveolar ridge is splitted in 2 parts. Using hand instruments the ridge is gradually expanded until we achieve an adequate width.

The intrabony defect between the 2 bone plates is filled spontaneously with newly formed bone similarly to the healing procedure of an extraction socket. However, filling the space with bone grafts alone or in combination with barrier membranes has been suggested.

It's advisable to have 3 mm wide, which should contain at least 1 mm of cancellous bone between the cortical lyers, so that we count with a proper blood supply on each side.

The technique is relatively safe. We must be careful not to fracture the buccal bone plate by performing a gradual expansion of the ridge [1-6].

Case Report and Discussion

A 50 year-old healthy woman, with anterior tooth-loss of the maxilla for over 10 years and removable prothesis backgrounds, presented for oral rehabilitation with dental implants. Clinical and radiographic evaluation, including a CT scan, showed a narrow alveolar ridge in the anterior maxilla with sufficient height and cancellous bone between the two cortical plates. Ridge splitting with osteotomes and chisels was planned, in order to create the desired width for implant placement.

We choose a 2 phases treatment. Phase 1: ARS surgery with bone graft, and clinical and radiographic post-operative controls. Phase 2: Implants placement and prosthesis design.

After the application of the anesthesia, the incision was performed exposing the area desired to split. It is advisable to extend the incision and the desperiostization some millimeters from the end of the osteotomy line, in order to obtain a proper sight of the alveolar ridge.

After mid-crestal incision, a horizontal osteotomy that splitted the alveolar ridge in 2 segments was achieved by gently tapping thin chisels with a mallet.

Then, a sequence of osteotomes of increasing size were used for the progressive expansion of the alveolar ridge until a 3 to 5 mm gap was established between the 2 segments.

Consecutively the gap was filled with synthetic bone graft.

After splitting the alveolar crest and filling the space with the bone graft, the surgical area was verified and cleaned, and a tight suture technique was performed with 4/0 Vicryl with continuous and single suturing to ensure flap tension and primary closure of the surgical wound, in order to keep the graft as hermetically as possible.

We control our patient on weeks 1, 2 and 4 after the surgery.

After a period of 6 month an X-ray evaluation was performed.

During the second surgery, we performed the implant placement where the bone was gained.

So, we can say that in our experience the alveolar ridge split is indeed a minimally invasive technique and a viable, effective and predictable option in such cases in which it is indicated following the indicated protocol.

Conclusion

In conclusion, the ridge splitting technique seems to be a minimally invasive option for horizontal augmentation of narrow alveolar ridges. Predictable clinical results can be achieved as long as a proper preoperative evaluation is performed and a precise surgical protocol is followed.

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