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Simultaneous vertical and horizontal bone augmentation with a new bi-directional distraction device

Case report

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Introduction

The concept of distraction osteogenesis enables the creation of new bone formation between vascularized bone surfaces being expanded and moved via a stable distraction device after an osteotomy. Many authors demonstrated that distraction osteogenesis is a reliable method for vertical augmentation.

Objectives

But orientation of the distraction direction has to be defined prior to the first movement. Mistakes in the way of angulation are very difficult to correct.

Material und Methods

Case report

This 45 year old woman suffering of severe atrophy of the alveolar crest due to periodontal bone resorption wanted to have an aesthetic rehabilitation. Avoiding mismanagement of the crown to root relation of the proposed implant structure, augmentation procedures were necessary. Avoiding angulation problems of the transferable bone segment this bi-directional distraction device offers segmental bone transport in 2 di-mension- vectors, i.e. vertical and/or horizontal direction. Following vestibular incision and osteotomy, the distraction device (MEDARTIS[®]) was installed. One week later, after removing sutures the segment was moved 0,5 mm once a day. Initially the movement was only in vertical direction, after 8 days movement was performed to the vertical and to the horizontal direction. After 14 days the distraction process was finished. Following a healing period of 3 months implant insertion (Replace Select[®]) was performed in the same session of the removal of the dis-traction device. Implant uncovering will be performed after 3 months of osseointegra-tion. During the whole treatment period patient had a fixed provisional bridge construction in the maxilla and in the mandible.

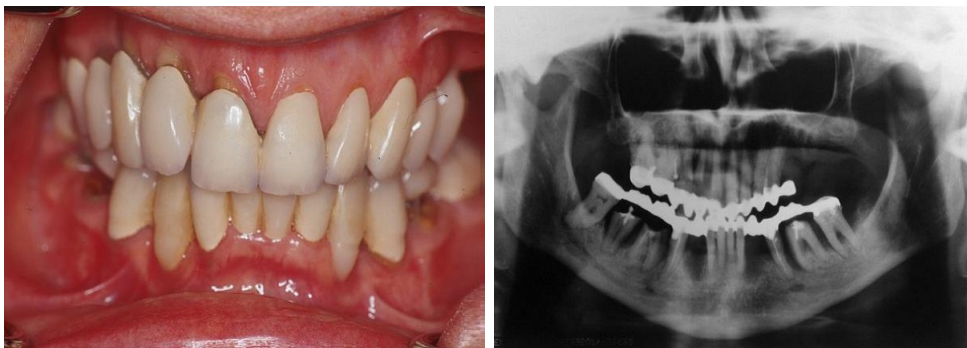


Fig. 1-2: Lack of alveolar bone due to severe periodontitis.

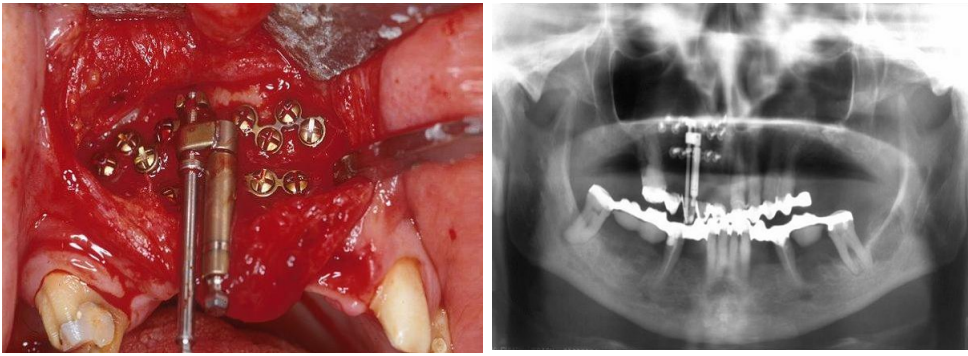


Fig. 3-4: Clinical and radiological situation after fixation of the distraction device.



Fig. 5-6: Initial distraction in vertical direction.

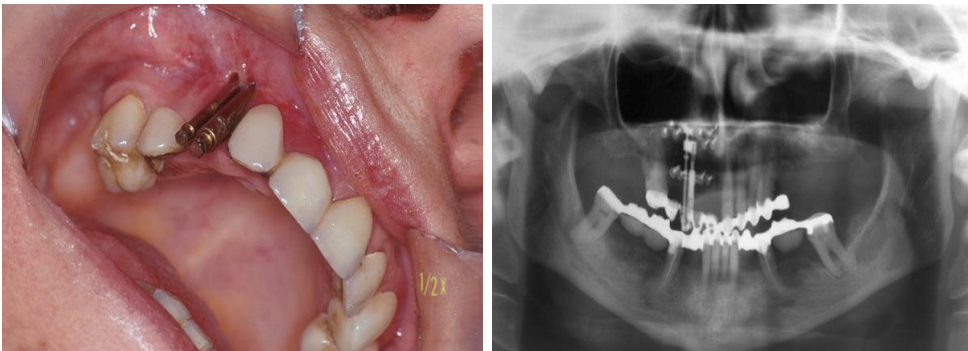


Fig. 7-8: Secondary combined distraction in horizontal and vertical direction.

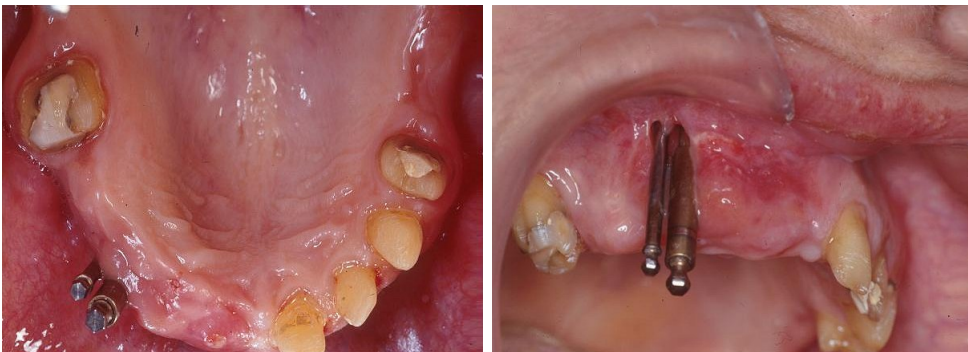


Fig. 9-10: Clinical aspect 3 months after the start of the distraction.

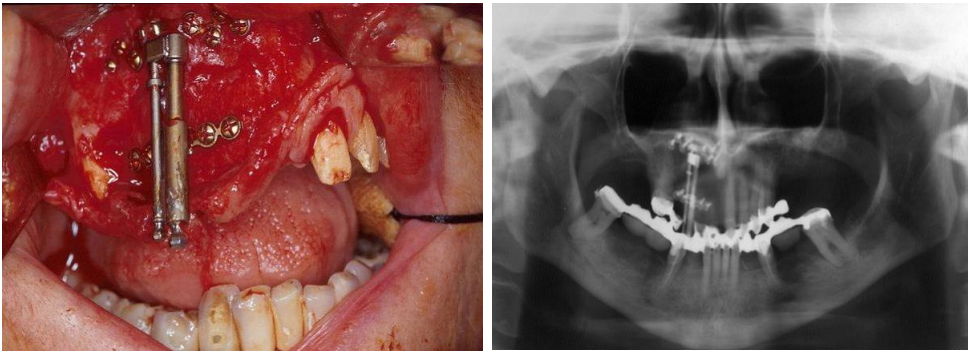


Fig. 11-12: Clinical and radiological situation 3 months after fixation of the distraction device.

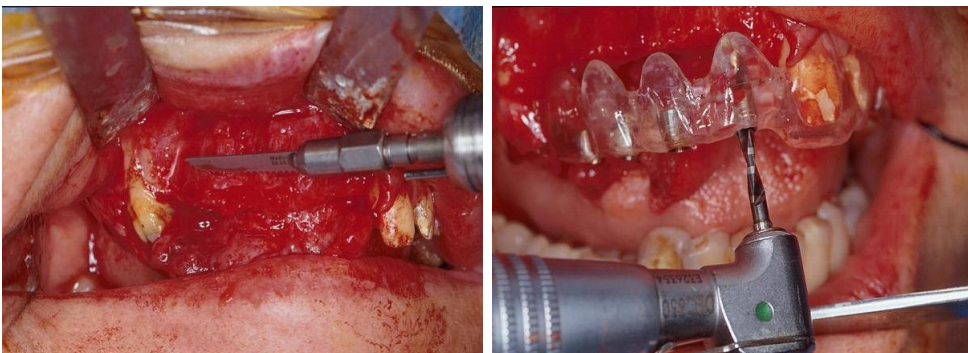


Fig. 13-14: Removal of the overcorrected bone and implant insertion due to the occlusal cast.

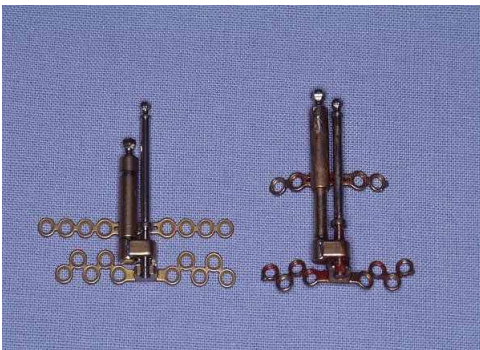


Fig. 15: Aspect of the bi-directional distraction device (MEDARTIS).

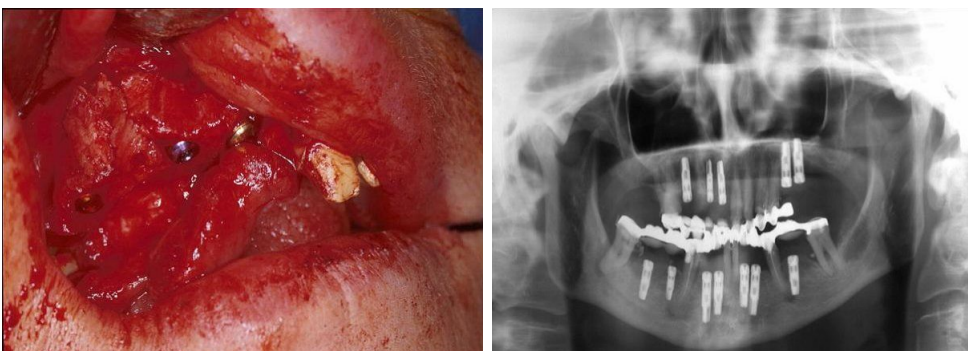


Fig. Clinical and radiological situation after implant insertion.

Results

The bi-directional distraction device (MEDARTIS) was stable enough compensating the vertical and horizontal bone deficit. Distraction process was performed easily and was partially performed by the patient itself. To this date no implant has been lost.

Discussion and Conclusions

Presenting the new bi-directional distraction device (MEDARTIS) it can be demonstrated the way and the opportunity to correct misangulation during the distraction process. Clinical short-term results demonstrate that simultaneous vertical and horizontal bone augmentation is possible by this new bi-directional distraction device.

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This poster was submitted by Dr. Dr. Andres Stricker.

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This 55 year old woman suffering of severe atrophy of the alveolar crest due to periodontal bone resorption wanted to have an aesthetic rehabilitation. Avoiding mismanagement of the crown to root relation of the proposed implant structure, augmentation procedures were necessary.

Avoiding angulation problems of the transferable bone segment this bi-directional distraction device offers segmental bone transport in 2 dimension-vectors, i.e. vertical and/or horizontal direction.

Following vestibular incision and osteotomy, the distraction device (MEDARTIS) was installed.

One week later, after removing sutures the segment was moved 0.5 mm once a day.

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Implant uncovering will be performed after 3 months of osseointegration.

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Discussion

Presenting the new bi-directional distraction device (MEDARTIS) it can be demonstrated the way and the opportunity to correct misangulation during the distraction process. Clinical short-term results demonstrate that simultaneous vertical and horizontal bone augmentation is possible by this new bi-directional distraction device.

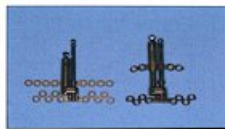


Fig 15



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9



Fig 10



Fig 11



Fig 12



Fig 13



Fig 14



Fig 16



Fig 17

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- Fig. 5-6: Initial distraction in vertical direction.
- Fig. 7-8: Secondary combined distraction in horizontal and vertical direction.
- Fig. 9-10: Clinical aspect 3 months after start of the distraction.
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- Fig. 15: Aspect of the bi-directional distraction device (MEDARTIS).
- Fig. 16-17: Clinical and radiological situation after implant insertion.

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