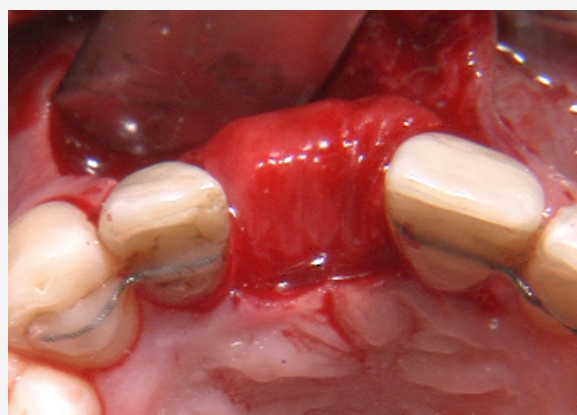
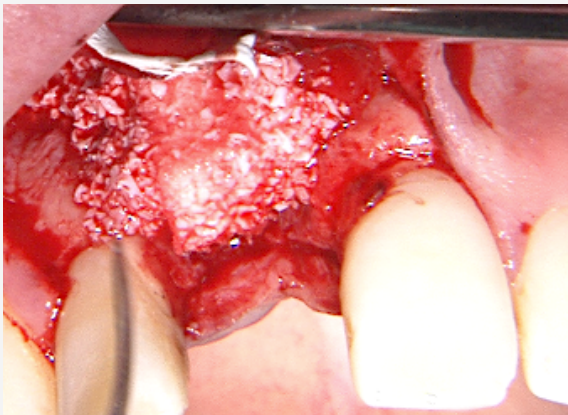
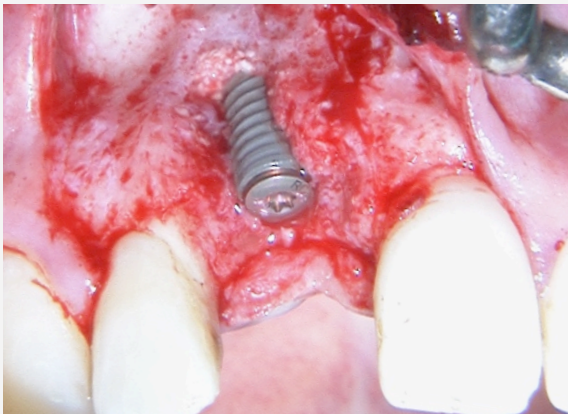


Treatment of a maxillary anterior bone dehiscence defect with GBR (“L shape Technique”) and simultaneous implant placement. Step by Step

Abstract

The „L shape Technique“ is indicated to augment the defect or to obtain an ideal contour of the alveolar ridge in case the buccal bone is showing a relevant dehiscence after implantation in the anterior area. This manual shows step by step how to proceed surgically and which instruments and materials can be used. Starting with the first cut, then showing how to place the bone graft material and ending with the last suture. Additionally it points out some relevant points to consider.



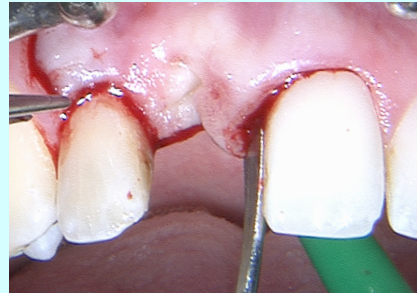
Content:

1. Anesthesia
2. Incision Design
3. Flap Elevation
4. Cleaning and preparation of the recipient implant site
5. Measurement of the defect and bone perforations drilling
6. Measuring, shaping and cutting of the resorbable collagen membrane
7. Placing and fixation of the membrane with pins
8. Preparation of the bone graft material
9. Application of the bone graft material
10. Mobilization of the flap for closure
11. Wound closure
12. Postoperative Instructions

1. Anesthesia

2. Incision Design

=> see document „implantation in the anterior area“



Due to an expected increase in volume based in consequence of the GBR a buccal releasing incision is made in addition to the horizontal- and sulcus-incision at the distal neighboring tooth. The horizontal incision should be performed on the palatal aspect of the ridge(connecting line of the palatal line angles) to allow a tension free wound closure.

3. Flap Elevation



A The flap is carefully raised with a fine scalpel or papillae-elevator on the line-angle of the vertical releasing incision.



B The flap elevation is then continued through the sulcus and into the crest area.

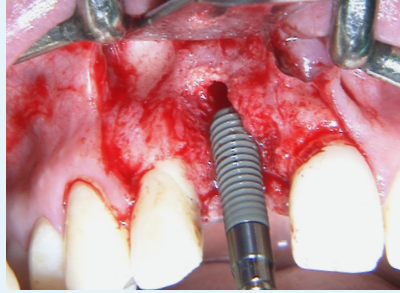


C The flap is elevated sufficiently on the buccal side until there is an adequate overview of the implantation and subsequent bone regeneration area. The elevation on the palatal side is only enough to see the whole extent of the bone defect.

4. Cleaning and preparation of the recipient implant site

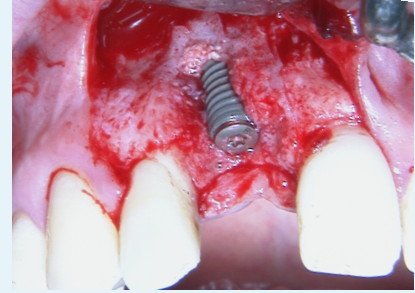


A Removal of granulation tissue or non-integrated bone particles with a sharp curette or excavator in the area of the future implant and bone regeneration site.



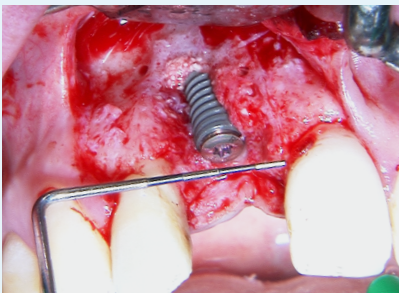
B Preparation and insertion of the implant according to the protocol "Implantation with existing bone defect".

=> see Chapter on
Implant placement in
the anterior area



C Insertion of a cover-screw screwed to the head of the implant (submucosal healing).

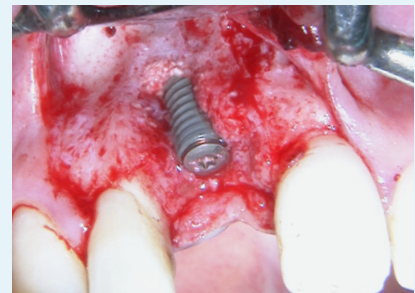
5. Measurement of the defect and bone perforations drillings



A Measuring the defect size with a periodontal probe. This guides the decision on the amount of bone substitute material needed and on the dimension of the membrane.



B Apical and lateral to the implant at a distance of approx. 3 mm and with a safe distance to neighboring roots, bone perforations are made with a spear drill or a fine round bur. These allow for the anchoring of the membrane.

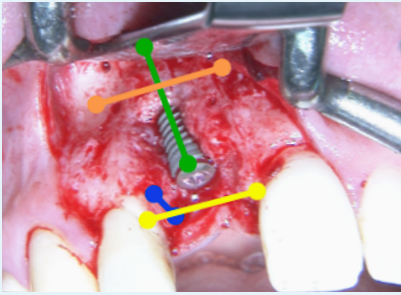


C Additional perforations can be made in the cortical bone. These provide bleeding points to increase the vascularization of the surgical area with bone-forming cells.

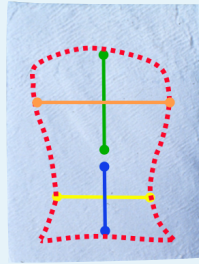


CAREFUL with adjacent anatomical structures!
Don't damage adjacent structures!

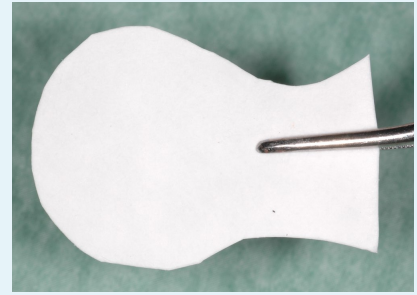
6. Measuring, shaping and cutting of the resorbable collagen membrane



A Draw a pear/bottle-shaped pattern for the membrane according to the measurement of the defect area with the aid of the sterile sealing foil of the membrane packaging.



B Intraoral testing and adaptation of the template to the desired shape. Now is the time when the actual resorbable collagen membrane is cut using the pattern template.

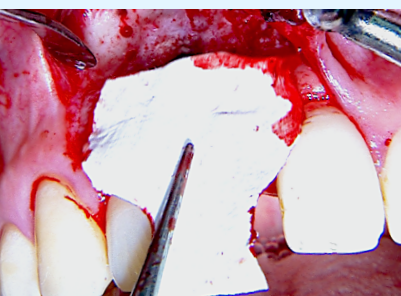
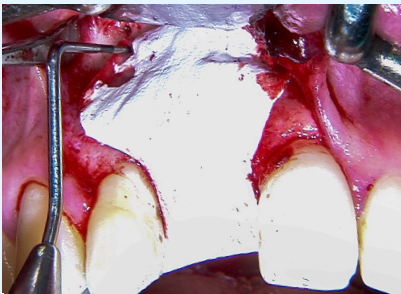


C Definitively adapted collagen membrane based on the extraoral template.

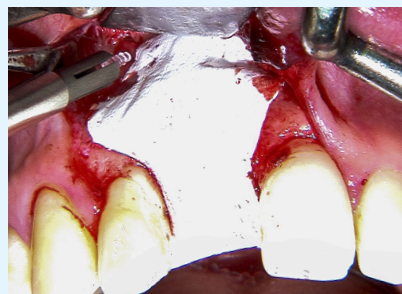
Membrane dimensions

The membrane is intended to cover the entire bone defect and is adapted circularly on the intact adjacent bone. The exposed root areas of adjacent teeth must not be covered.

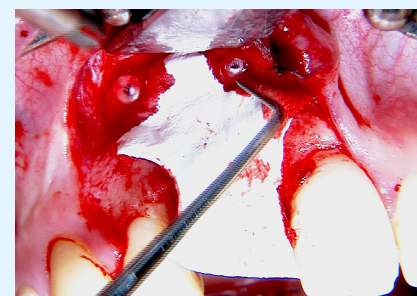
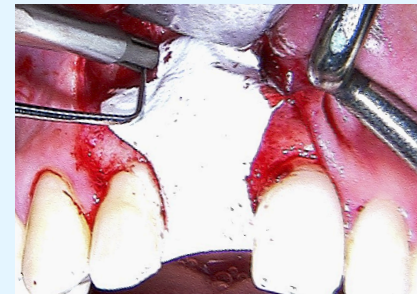
7. Placement and fixation of the membrane with pins



A In order to facilitate handling, the collagen membrane should be placed as dry as possible in the desired position. With the help of a probe, the predrilled perforations are probed through the membrane. The fixation is performed at the two opposite apical ends of the membrane. The elevator helps stabilize the membrane while being perforated.



B The resorbable pin is fixated to the pin holder by the dental assistant. The pin is placed in situ with the pin hold by applying pressure or by tapping perpendicular to the bone with a fine hammer. It should be noted that the pin should be inserted in the same direction as the pilot hole.



C By a tilting movement the pin holder is removed. The pin can be held with a probe while removing the holder.

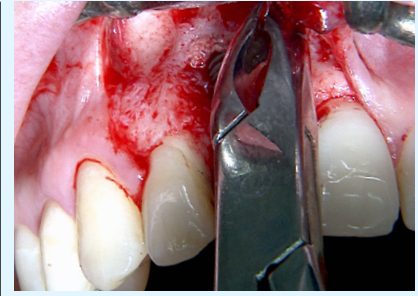
8. Preparation of the bone graft material



A Opening and trimming of the collagen-stabilized bone substitute in the form of an "L". The cut out material can be used for adjacent areas.



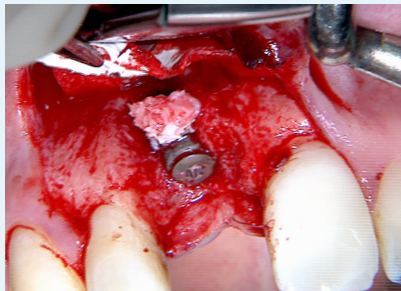
B Placement of bone granules in a sterile Dappen dish and mixture with NaCl and / or patient's autogenous blood.



C Extraction of autogenous bone (optional)

It can be used in addition to xenogeneic bone replacement material. This bone can be harvested during implant preparation in the form of drill shavings or subsequently using fine forceps from neighboring areas (eg., from the anterior nasal spine) and mixed with autologous blood.

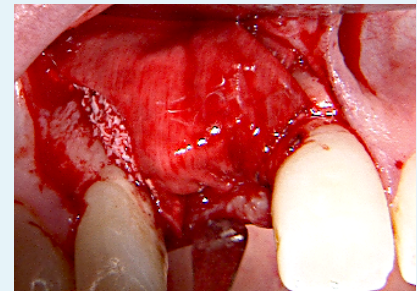
9. Application of bone graft material



A The membrane fixated apically with 2 pins is folded to the buccal side. The bone granules/ autogenous bone is applied to the exposed implant surface using an elevator.



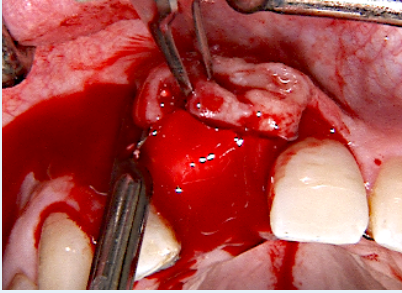
B Subsequently, the bony contour is augmented buccally (thickness) and crestally (height) with the collagen-stabilized bone substitute material in "L"-shape and, if necessary, the lateral areas are filled up with granules.



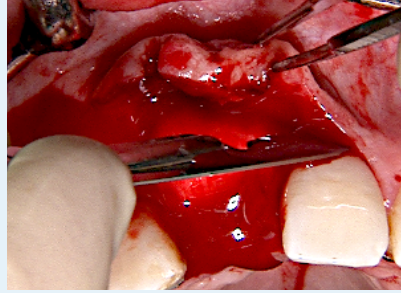
C The membrane is folded over the augmented bone and pushed with an elevator under the palatal flap. Excess portions of bone replacement material are carefully removed.

The bone substitute should cover the defect completely. The contour of the augmentation should be over-corrected buccally to compensate for the loss of volume as a result of flap closure and healing.

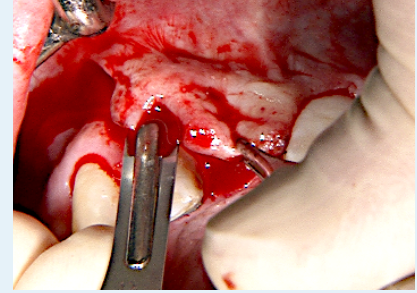
10. Mobilization of the flap for closure



A With the help of a new scalpel blade, the periosteum is split at the base of the flap. The incision starts in the area of the vertical release in one stroke in the medial direction.



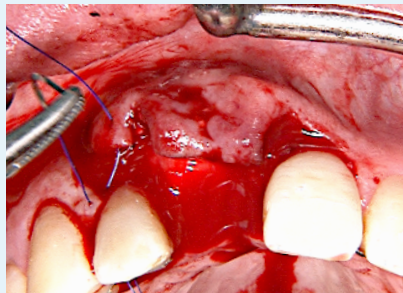
B For a tension-free closure, the flap should have the capacity to be advanced approx. 2-3 mm above the palatal incision edge. If this is not possible, the flap must be released by means of an extended periosteal releasing incision.



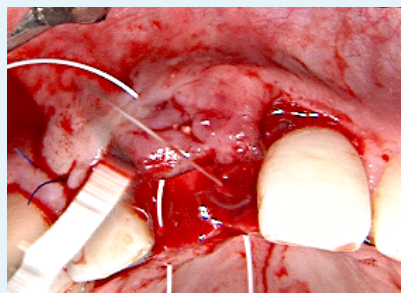
C When splitting the periosteum, care should be taken not to perforate the flap. The periosteum splitting therefore should always be done parallel to the mucoperiosteal flap with a view to the flap from the outside. For a tension-free wound closure, the augmentation bone volume generated, the onset of wound contraction and the postoperative swelling should be taken into account.

In case of profuse bleeding during the periosteal splitting, it is advisable to wait a few minutes applying pressure for hemostasis and remain calm.

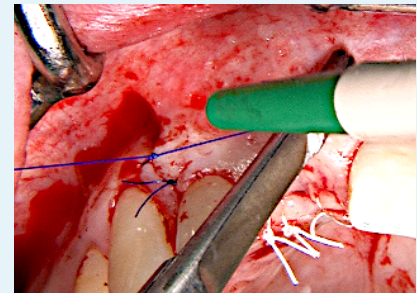
11. Wound closure



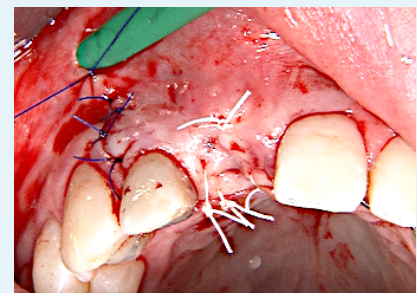
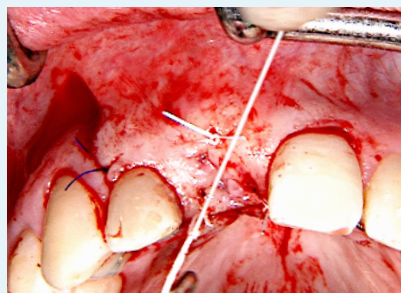
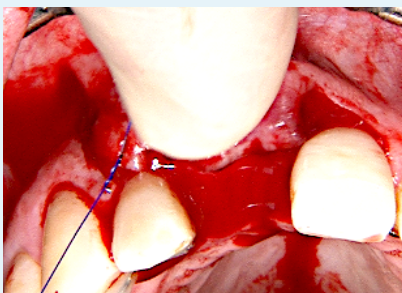
A Wound closure is started in the area of the vertical incision. Non-resorbable sutures are preferred for closure. With a vertical mattress suture, the papilla is first fixated palatally.



B Subsequently, depending on the width of the flap, 1 or 2 horizontal mattress sutures are performed at the level of the mucogingival junction of the anterior gingiva. Single interrupted sutures approximate the horizontal incision 2 mm from the edge of the flap.



C Finally, the vertical releasing incision is sutured with single interrupted sutures. The easiest way to perform these vertical sutures is to keep the lip away from the flap with a small hand mirror.



12. Postoperative Instructions

Generous adaptation and relieving of the temporary restoration: the surgical area must not be compressed under any circumstances, even when the wound swells.

Instructions of postoperative care

Delivery of:

Sterile gauze for possible bleeding. Apply with pressure
Ice compression for swelling

Postoperative medication:

-Antibiotics:

Amoxicillin/clavulanic acid 875mg / 125mg (double starting dose, 2x daily for a total of 10 tablets)

Clindamycin 300mg (double starting dose, 3x daily for a total of 16 tablets)

-Analgesic / Anti-inflammatory:

NSAIDs (e.g., diclofenac 75mg max every 8h)

-Chlorhexidine rinse

=> see document „Instruction for Post-Operative Care“