bone & tissue regeneration

botiss biomaterials

Jason® membrane

NATIVE PERICARDIUM GBR/GTR MEMBRANE

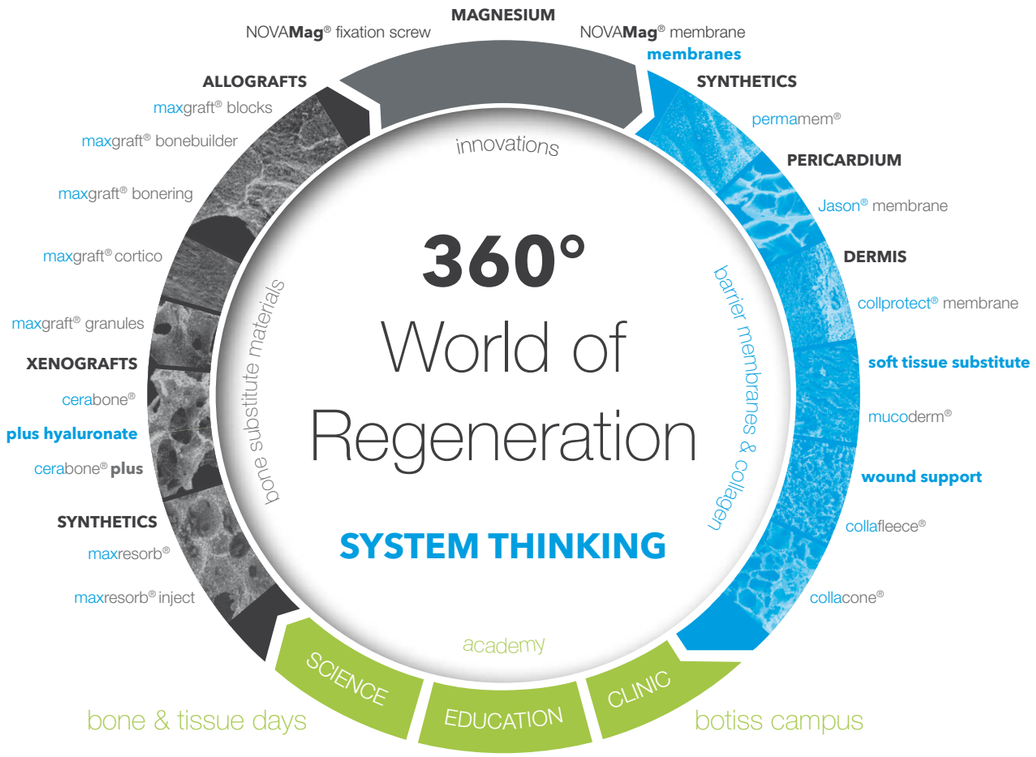
barrier membrane

native

reliable

resorbable

botiss regeneration system



Development / Production / Distribution

maxresorb®

Synthetic biphasic calcium phosphate

maxresorb® inject

Synthetic injectable bone paste

cerabone®

100% pure bovine bone mineral

cerabone® **plus**

cerabone® mixed with hyaluronate

maxgraft®

Processed allogenic bone graft

maxgraft® cortico

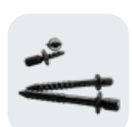
Processed allogenic bone plate

maxgraft® bonering

Processed allogenic bone ring

maxgraft® bonebuilder

Patient matched allogenic bone implant



NOVA**Mag**® fixation screw

Resorbable magnesium screw

NOVA**Mag**® membrane

Resorbable magnesium membrane

permamem®

High-density PTFE barrier membrane

Jason® membrane

Native pericardium GBR / GTR membrane

collprotect® membrane

Native collagen membrane

mucoderm®

3D-stable soft tissue graft (Collagen)

collacone®

Collagen hemostat (Cone)

collafleece®

Collagen hemostat (Sponge)

bone & tissue regeneration

botiss biomaterials

360° – the botiss regeneration system: Innovation, Safety, Reliability, and Aesthetics

botiss biomaterials offers a unique systematic BTR approach – the complete regenerative biomaterial portfolio for Implantology, Oral and CMF Surgery, and Periodontology at hand.

We all know – no single bone graft or soft tissue biomaterial can suit all medical needs, biological situations, and indications. Factors, such as indication, age, hygiene, biotype, bone height, and treatment plan, require a sophisticated approach with different, coordinated products.

To achieve optimal results, we offer you the botiss regeneration system. It includes all long-term proven biological materials (e.g., bovine, synthetic, allografts, collagen, granules, blocks, membranes, and soft tissue matrices), which can be used in various combinations for each specific indication. All products are manufactured according to the highest quality standards.
Patient's safety, ease of use and reliable treatment results – these are your and our first priorities. The products of the botiss regeneration system have proven their success in terms of safety, efficacy, and reliability in a multitude of preclinical and clinical studies and, most importantly, in the daily clinical work, with hundreds of thousands of patients treated worldwide.

We substantially invest in research and education. Unique innovations, such as cerabone® plus and NOVAMag®, the concept of highquality learning and education with the botiss academy, and our international bone & tissue days are the results of our partnership with worldwide renowned academic research institutes, global opinion leaders, and practitioners in their daily clinical environment.

botiss biomaterials is one of the leading companies in the field of dental bone and tissue regeneration. The botiss regeneration system is available in over 100 countries worldwide via a global network of distribution partners and employees, who are committed experts in the field of oral surgery and implantology.

botiss biomaterials is an innovative, clinically oriented medical device/pharmaceutical company headquartered in Germany and further development and production sites in Germany, Austria and England.

We proudly welcome you to the botiss regeneration system community. We invite you to share your experiences and suggestions with us, which are precious to further improve our products or develop new product concepts.

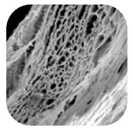
Dr. Drazen Tadic
dt@botiss.com

Oliver Bielenstein
ob@botiss.com

Jason® membrane

NATIVE **PERICARDIUM GBR/GTR MEMBRANE**

Jason® membrane is a native collagen membrane obtained from porcine pericardium, developed and manufactured for dental bone and tissue regeneration. Besides its very low thickness it provides a naturally long barrier function based on the specific composition and structure of the pericardial collagen fibers[7,9].



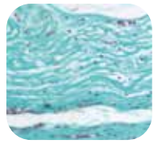
SEM image of Jason® membrane

Owing to the preservation of the natural biomechanical properties of the pericardium, Jason® membrane exhibits beneficial handling characteristics such as a remarkable tear resistance and effective surface adaptation[8].

INDICATIONS:

Implantology, Periodontology and Oral and CMF Surgery

- Fenestration and dehiscence defects
- Sinus lift
- Socket and ridge preservation
- Alveolar ridge augmentation and reconstruction
- Intraosseous defects (1 to 3 walls)
- Furcation defects (class I and II)
- Protection and covering of minor perforations of the Schneiderian membrane



Jason® membrane maintained the barrier function 56 days after subcutaneous implantation in rats

Due to the unique production process, the superior properties of the native pericardium are preserved during the extensive cleaning procedure that is applied for the production of Jason® membrane. Therefore, Jason® membrane shows a natural honeycomb-like, multilayered collagen structure with an increased content of collagen type III leading to a remarkable tear resistance and slow degradation of Jason® membrane[9, 10, 11, 12]. This ensures a natural long barrier function, making the Jason® membrane our recommended choice particularly for large augmentative procedures.

PROPERTIES

- Naturally long barrier function
- Multi-directional strength and tear resistance
- No stickiness after hydration
- Excellent surface adaptation
- Easy handling, can be applied dry or wet
- Low thickness

PRODUCT SPECIFICATIONS

Art.No.	Size	Content
681520	15 x 20 mm	1 membrane
682030	20 x 30 mm	1 membrane
683040	30 x 40 mm	1 membrane

THE ORIGIN
OF COLLAGEN MEMBRANES

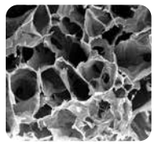
The first collagen membranes available on the market were of bovine origin (Achilles tendon and pericardium). Nowadays, porcine membranes are widely used because their application excludes the risk of BSE transmission.

Moreover, porcine collagen exhibits a high homology to human collagen and therefore a very low antigenicity[6]. Due to these reasons, botiss collagen membranes are exclusively produced from porcine collagen.

Collagen membranes may be derived from various tissues, ranging from dermis, to peritoneum and pericardium. Accordingly, these membranes differ in their handling and degradation properties, as well as their barrier function.

THE ADVANTAGES OF COLLAGEN

Several factors make collagen an optimal biological material for the use as barrier membranes. One important characteristic is the excellent biocompatibility of collagen and its degradation products. Collagen is widely distributed throughout the body, making up approx. 60% of all proteins within the gingival connective tissue. Due to their low antigenicity, animal collagens may be used in humans without causing tissue rejection.



3D structure of a collagen fleece

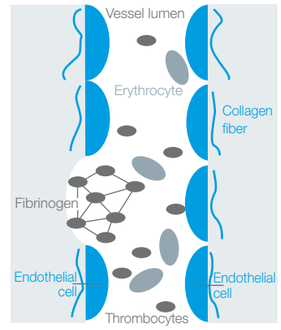
Collagens are resistant to any unspecific proteolytic degradation and are only degraded by specific enzymes called collagenases. Collagens are involved in the primary hemostatic reaction. Thus, collagen membranes contribute to a fast stabilization of the wound area. Another advantage of collagen is its chemotactic attraction of regenerative cells such as osteoblasts, gingival fibroblasts and periodontal ligament cells. Following dehiscence, the exposure of a collagen membrane leads to its quick proteolytic degradation. However, a secondary granulation without any inflammatory reaction may be observed[4].

BENEFITS

- Exceptional biocompatibility
- Support of hemostasis
- Low antigenicity
- Degradation by specific enzymes
- Protection and covering of minor perforations of the Schneiderian membrane

COLLAGEN – **A NATURAL HEMOSTATIC AGENT**

Damage to the blood vessel wall leads to subendothelial collagen exposure. The collagen directly or indirectly interacts with the surface receptors on thrombocytes. The binding of collagen initiates a reaction cascade leading to transformation and aggregation of the thrombocytes. Additionally, the thrombocytes are cross-linked by fibrinogen. The resulting (white) thrombus initially stabilizes the wound[5]. Accordingly, collagen membranes support the formation of a blood coagulum and contribute to a rapid stabilization of the wound area. Due to their hemostatic effect, collagens are not only used as barrier membranes, but also as collagen sponges and cones for stabilization of biopsy harvesting sites or covering of minor oral wounds and extraction sockets.



PROPERTIES OF **PERICARDIUM MEMBRANES**

Many collagen membranes have a limited barrier function due to their rapid enzymatic degradation. The stability and barrier function of collagen membranes are tightly linked to the properties of the native tissue from which they originate.

Jason® membrane is a native collagen membrane **derived from porcine pericardium.**

The pericardium is a double-layered tissue sac that surrounds and protects the heart, and allows volume changes by contraction and relaxation of the heart muscle. Imagine the human heart beats around 100.000 times a day, that's almost 40 million times per year! For every beat, the heart requires a similar effort as that needed to squeeze a tennis ball with one hand. The pericardial tissue consists of highly organized, naturally cross-linked fibers of collagen type I/III. During the prodcution process, this particular collagen structure and composition is preserved.

Despite its low thickness, Jason® membrane exhibits an excellent multidirectional tear resistance

Due to its structural characteristics Jason® membrane undergoes slow degradation and thus offers a prolonged barrier function[7]. Furthermore, Jason® membrane is distinguished by extraordinarily high tear resistance and excellent handling properties (e.g. good adaptation to surface contours, no sticking)[8].

Production process

Jason® membrane

SAFETY AND STABILITY

Jason® membrane consists of natural porcine collagen originating from animals destined for the food industry and certified according to EN ISO 22442.

PERICARDIUM

Multi-stage cleaning process

Lyophilization

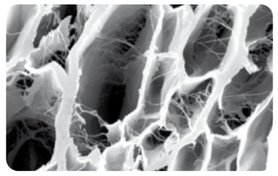
Packaging
EO-sterilization

Sterile product

Jason® membrane

Jason® membrane is a native membrane, the natural properties of the original tissue (pericardium) is preserved during the production process. The inherent architecture of the collagen structure provides superior handling properties, such as tear resistance, tensile strength, and adaptation to surface contours, in comparison to „non-native“ collagen membranes[10].

The particular multi-stage cleaning process effectively removes all non-collagenic proteins and antigenic components. The resulting membranes exhibit a natural three-dimensional collagen structure mainly composed of collagen type I and a lower share of collagen type III.



Natural three-dimensional collagen network of Jason® membrane

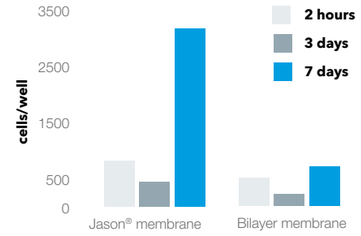
Pre-clinical testing

JASON® MEMBRANE SUPPORTS ATTACHMENT AND PROLIFERATION OF OSTEOBLAST-LIKE CELLS

Results of *in vitro* cell cultures. Dr. M. Herten, University of Münster and Prof. Dr. Dr. D. Rothamel, Mönchengladbach Hospital, University of Düsseldorf[7]

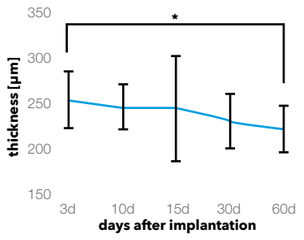
Incubation of the multi-layered Jason® membrane and a competetive bilayer membrane with osteoblast-like SaOs-2 cells showed a significantly higher cell proliferation on the Jason® membrane after seven days.

The excellent cell attachment and proliferation on Jason® membrane highlights its suitability as scaffold for osteoblast guidance, which supports the bony regeneration of covered defects.

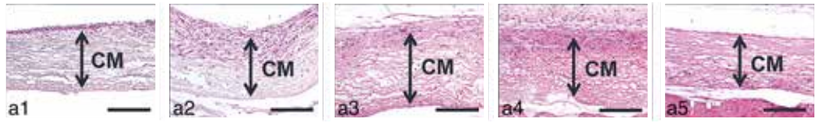


DEGRADATION AND BARRIER FUNCTION OF JASON® MEMBRANE

Results from a degradation study in a mouse model[9]



The indication, the way of application as well as differences in the metabolism of each patient affect the degradation rate of a collagen membrane. To follow the progression of resorption of Jason® membrane at different time points, animal experiments were performed as these tests cannot be realized in humans. Subcutaneous implantation in mice demonstrated that Jason® membrane was intact after a period of 60 days. As the metabolic rate of mice is much higher compared to humans, the barrier function following implantation in humans will be significantly longer.



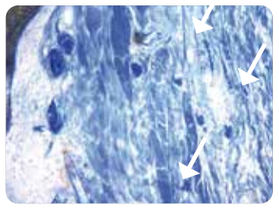
Pictures and data adapted from Barbeck et al. 2014[9] showing the degradation of Jason® membrane after subcutaneous implantation in mice. Membrane is still intact after 60 days.

In vivo pre-clinical testing

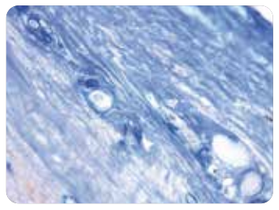
Jason® membrane –
EXCELLENT BIOCOMPATIBILITY AND TISSUE INTEGRATION
Results from an animal model, Prof. Dr. Dr. D. Rothamel, Möchengladbach Hospital, University of Düsseldorf[7]

Analysis of the tissue integration and morphological structure of Jason® membrane at four to 12 weeks after lateral augmentation in a dog model.

The membrane was integrated into the surrounding tissue without any inflammation. Significant degradation of the membrane started at week eight and proceeded until week 12. A bilayer membrane that was tested in the same model showed a comparably good tissue integration, but was almost completely degraded after eight weeks[7].



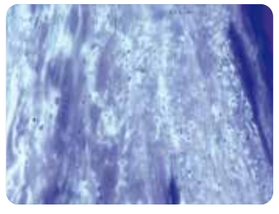
Jason® membrane after four weeks healing time



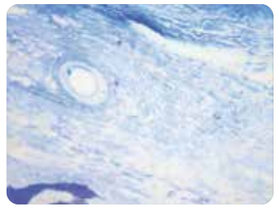
The bilayer membrane after four weeks healing time

4 weeks healing time
Both membranes showed good tissue integration without any inflammatory reaction, as demonstrated by Toluidine staining.
Initial ingrowth of blood vessels improves nutrition of the graft and osseous regeneration.

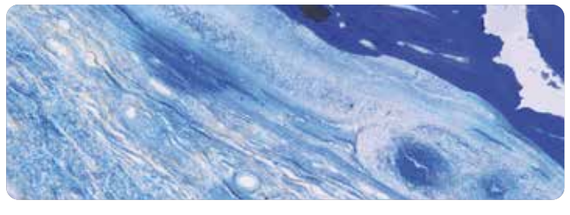
8 weeks healing time
The bilayer membrane was almost completely resorbed. Jason® membrane was still intact, serving as barrier against ingrowth of surrounding soft tissue.



The bilayer membrane after eight weeks healing time



Jason® membrane after eight weeks healing time

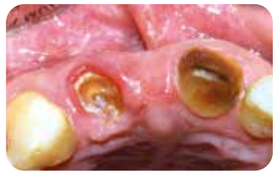


Jason® membrane after 12 weeks healing time

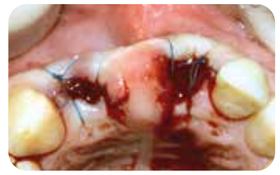
12 weeks healing time
Jason® membrane was almost completely degraded and replaced by a periosteum rich in collagen fibers.
The collagen of the membrane is partially visible as cloudy fibrous areas.

CLINICAL CASE BY
Dr. Sebastian Stavar, Houten, Netherlands

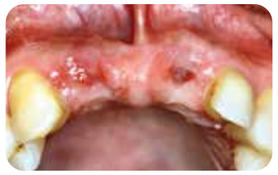
RIDGE AUGMENTATION



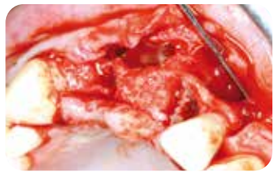
Initial clinical situation with broken bridge abutment in regio 12, tooth 21 not worth preserving and tooth 11 lost by a front teeth trauma several years ago



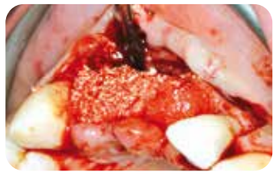
Situation after atraumatic tooth extraction and suturing of wound margins



Clinical situation five weeks after extraction



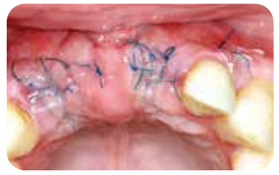
Preparation of a mucoperiosteal flap - extensive bone deficit in horizontal and vertical dimension



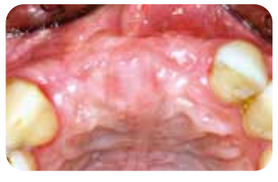
Horizontal and vertical augmentation with cerabone® and autologous bone after placement of two implants

Coverage of the augmentation site with Jason® membrane

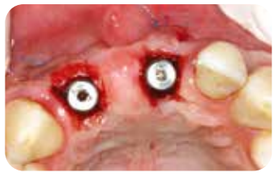
Tension-free wound closure



Clinical view two weeks post-operative



Complication free healing eleven weeks after augmentation



Exposure of implants and insertion of healing abutments

Shaping of the emergence profile using the temporary prosthesis

Final prosthetic restoration with implant-borne bridge in regio 12-21 and crown on tooth 22

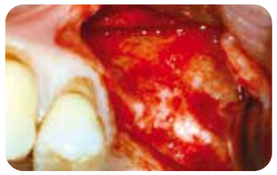
CLINICAL CASE BY

Prof. Dr. Dr. Daniel Rothamel, Mönchengladbach Hospital,
University of Düsseldorf, Germany

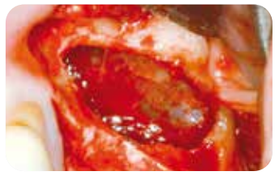
SINUS LIFT WITH TWO-STAGE IMPLANT PLACEMENT

Clinical situation before sinus lift

Clinical situation before sinus lift, occlusal view



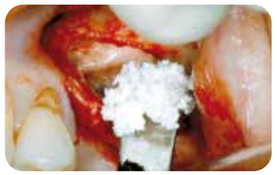
Clinical situation following preparation of the mucoperiosteal flap



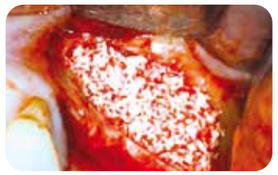
Preparation of a lateral sinus window

Placing of Jason® membrane in the sinus cavity

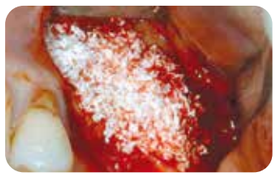
Jason® membrane serves as protection for the Schneiderian membrane



Filling the sinus cavity with cerabone®



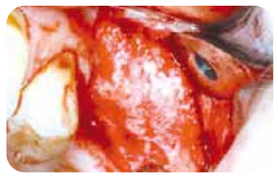
cerabone® in the sinus cavity



Additional lateral augmentation with cerabone®

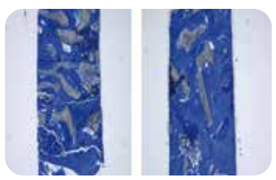
Covering of the augmentation area with Jason® membrane

Tension-free wound closure with single interrupted sutures



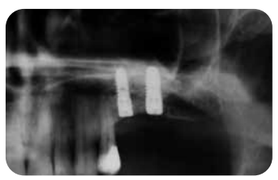
Excellent osseous integration of the cerabone® particles without soft tissue ingrowth at re-entry, six months post-operative

Stable insertion of two implants into sufficient bone matrix



Histological sections of biopsy taken at the time of implantation

Magnification of the histological sample demonstrates complete integration of cerabone® particles within the newly formed bone matrix



Post-operative X-ray

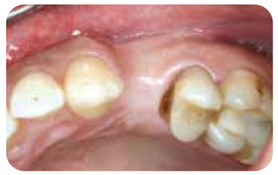
CLINICAL APPLICATION OF JASON® MEMBRANE

CLINICAL CASE BY

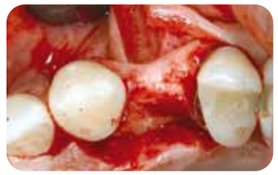
Prof. Dr. Dr. Daniel Rothamel, Mönchengladbach Hospital,
University of Düsseldorf, Germany

LATERAL AUGMENTATION

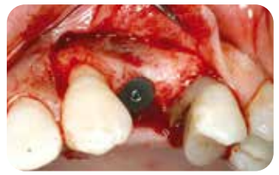
Lateral defect in regio 24 at six months after extraction



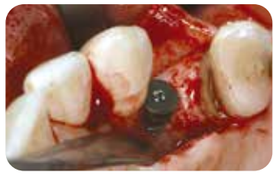
Crestal view of defect



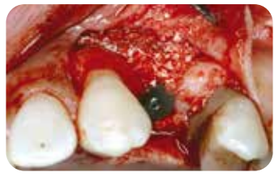
Surgical presentation of the bone defect



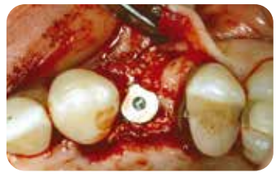
Thin buccal bone after implant installation



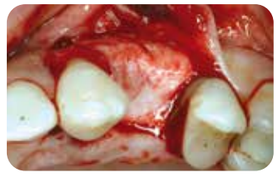
Dehiscence defect at palatal side



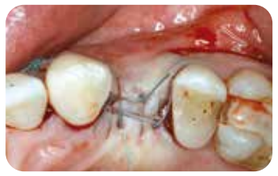
Lateral augmentation with cerabone® and autologous bone (mixture 1:1)



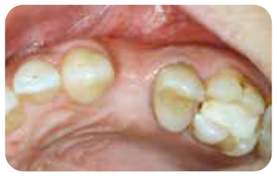
Further augmentation at the palatal side



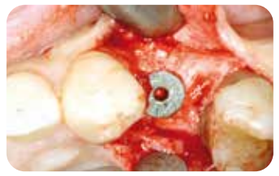
Application of Jason® membrane



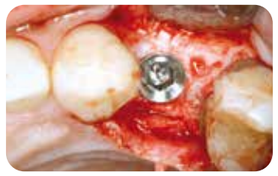
Soft tissue closure



Clinical situation after three months



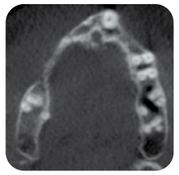
Satisfactory bone formation and volume maintainance



Stable hard tissue conditions on both buccal and palatal side

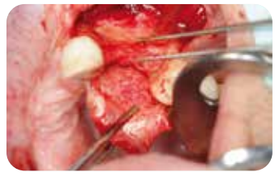
CLINICAL CASE BY
Dr. Dr. Dr. Oliver Blume, Munich, Germany

RIDGE AUGMENTATION IN THE MAXILLA

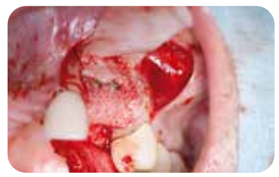



Preoperative clinical situation - severe atrophy of the maxillary bone

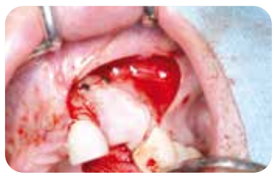
Three dimensional reconstruction of the bone defect and planned maxgraft® bonebuilder blocks (blue)



Upper left maxilla - severe atrophic ridge



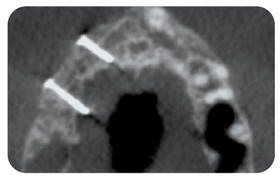
Fixation of maxgraft® bonebuilder and contouring with allogenic particulated material



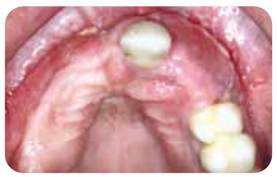
Covering with Jason® membrane and one layer of PRF matrices

Tension-free and saliva-proof wound closure

Fixation of two more maxgraft® bonebuilder blocks on upper right maxillary ridge



X-ray six months post-operative



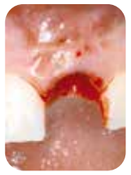
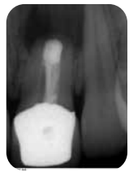
Clinical situation six months after augmentation

Implant placement

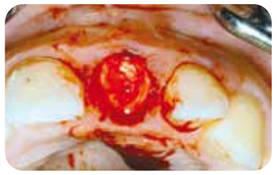
Temporary provision

CLINICAL CASE BY
Dr. Marius Steigmann, Neckargemünd, Germany

CERABONE® FOR COVERAGE OF IMPLANT DEHISCENCE AND RIDGE AUGMENTATION

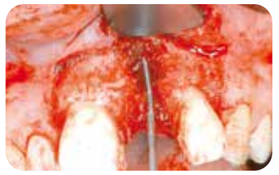



Extraction of tooth 21 after endodontic treatment



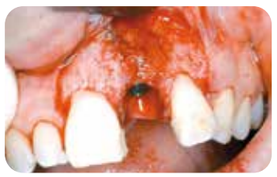
Application of collacone® for stabilization of the blood clot

Buccal bone defect after eight weeks healing time

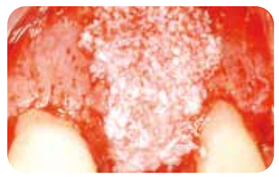


A periodontal probe demonstrates the vertical extension of the defect

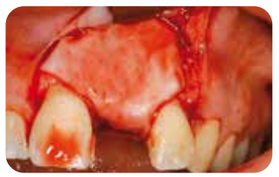
Implant placed into the former extraction socket



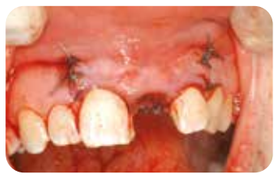
Surface of the implant is covered with autologous bone



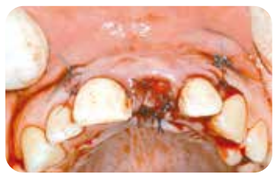
Coverage of the autologous bone with cerabone® (0.5 - 1.0 mm)



Covering of the bone substitute with Jason® membrane

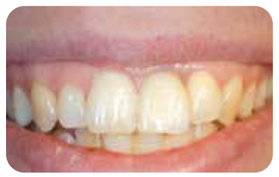


Closure of the site using single sutures after periosteum slitting

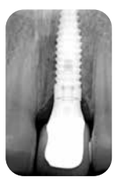


Tension-free suturing maintains undisturbed healing

Abutment installation after implant uncovering, six months after implantation



Final prosthetic restoration with a full-ceramic crown



Radiographic control five years post-operative

CONTOUR MAINTENANCE
For augmentations in the aesthetic region cerabone® provides long-term dimensional stability and therefore a good bone bed to support an optimal contour of the soft tissue and sustained aesthetic result.

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