PATIENT INFORMATION

bone & tissue regeneration

botiss biomaterials

Bone augmentation with biomaterials

established

safe

natural

Implantation –

stability is crucial for success

The most important prerequisite for long-term success of an implant is sufficient bone volume. If the jaw bone does not allow a stable implant insertion due to a reduction of the alveolar ridge, a bone augmentation has to be performed. You can compare this situation with the insertion of a dowel into a very thin wall; the wall will not provide sufficient support.

Atrophy of the jaw – bone loss after tooth extraction

Frequently, after previous tooth loss or prolonged wearing of prosthesis a degeneration of the jaw bone (jaw ridge atrophy) can be observed.

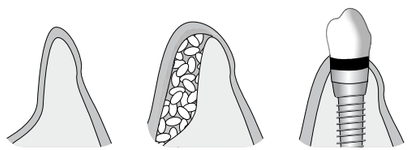
Bone is a dynamic tissue that becomes stronger in areas subject to high mechanical stress, and is degraded where load is missing. In the healthy jaw the natural teeth transfer a stimulus to the bone, providing a signal for its maintenance. Following tooth loss this stimulus is missing and the bone is gradually reduced. In these cases an augmentation of the jaw bone prior to implantation is required. Besides the many functional and aesthetic advantages of an implant-borne restoration, implants transfer the pressure caused by chewing to the jaw bone, therefore contributing to its preservation.

Bone augmentation –

regeneration of lost bone volume

Today, most implant placement procedures require a bone augmentation to allow an optimal insertion of the implant.

If there is sufficient width and height of the residual jaw bone, an implant can be inserted simultaneously with the augmentation of the surrounding bone (one-stage procedure). If there is not sufficient bone volume for implant insertion with primary stability, the bone has to be augmented beforehand. The implant can then be inserted after a certain healing period (two-stage procedure).



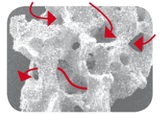
For augmentative procedures the implantologist can harvest bone chips or bone blocks from different areas of the oral cavity (autogenous bone harvested from e.g. toothless areas, mandibular angle, and chin) for placement at the augmentation site. Indeed, the patient's own bone is an optimal material due to its excellent biological properties, but there are also disadvantages limiting its use[1].

The availability of autogenous bone is limited, and harvesting requires generation of a second surgical site, which is associated with increased pain as well as a higher risk of infection and complications. Therefore, various bone substitute materials have been developed for the regeneration of lost bone.

BONE SUBSTITUTE MATERIALS –

alternatives for the use of autogenous bone

Bone substitute materials resemble human bone in their structure and composition.



Due to its porous structure, blood vessels can easily grow into the material.

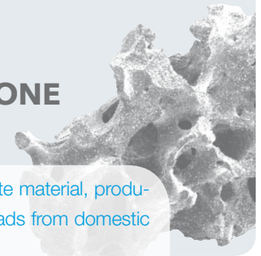
Cells use the material as a scaffold, which enables their migration and deposition of new bone matrix.

The bone substitute material (grey) is gradually integrated into the newly formed bone (blue).

Mostly they are applied as particles to the defect site, but there are also blocks available that can be fixed to the jaw. Bone substitute materials serve as scaffolds for blood vessels and bone forming cells.

Specialized cells migrate along the grafting material and start with the formation of new bone matrix, which hardens later on. Thereby, the material will be progressively integrated into the newly formed bone and remodeled into own bone. Bone substitute materials can originate from animal bone (mostly from domestic cattle) or human donor bone, or they are synthetically produced[2].

cerabone® – NATURAL BOVINE BONE



cerabone® is a natural bone substitute material, produced by the processing of femoral heads from domestic cattle intended for food industry.

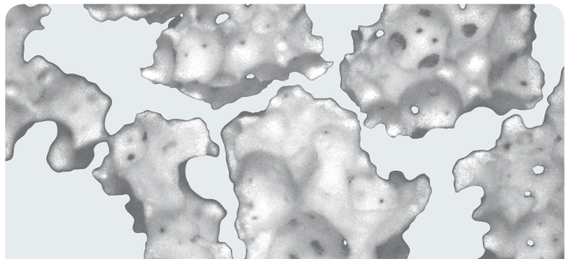
The femoral heads are heated up to 1250°C burning all inflammation-causing or allergenic components. Furthermore, all potential bacteria or viruses, that could transmit diseases, are destroyed[3]. Studies have shown that such a high temperature treatment is also suitable to destroy prions responsible for the transmission of mad cow disease. A concluding gamma-irradiation ensures the final sterility of the product. cerabone® fulfills the highest EU-regulatory and security requirements; its CE certification was issued in 2002.

Following implantation, the material will be integrated into the newly formed bone. Even years after surgery it can be detected at the augmentation site, therefore providing a long-term stability.

maxresorb® and maxresorb® inject – SYNTHETIC BONE SUBSTITUTE MATERIALS

maxresorb® is a completely synthetic material, composed of calcium phosphate, the main component of bone. Its porous structure resembles natural bone.

When using maxresorb® any risk for infection can categorically be excluded. Besides, its special composition and structure optimally support bone formation. Initially, maxresorb® particles are integrated into the newly formed bone, then are gradually remodeled by the body's normal processes. The material is entirely resorbed after about two years.



maxgraft® – **PROCESSED HUMAN BONE**

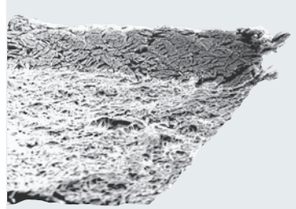
maxgraft® is a highly biocompatible bone substitute material originating from human donors in Germany, Austria and Switzerland. The material is safe and sterile. The donor bone is processed at the Cells⁺Tissuebank Austria (C⁺TBA). The validated sterilization process guarantees the highest degree of safety[4].

The structure of maxgraft® resembles autogenous (body's own) bone, providing the body with a material that optimally supports new bone formation. Following implantation, the donor bone is penetrated by newly formed bone matrix, and then gradually remodeled into own bone[5].
The duration of this process depends on several factors and is completed after about six to twelve months. maxgraft® is the first choice for block augmentation performed for horizontal and vertical ridge augmentation.

Membranes –
Protection of the augmentation site

Barrier membranes are placed over a bone substitute material to provide an optimal and undisturbed healing of a defect. The membrane prevents migration of the bone graft particles into the oral cavity, as well as ingrowth of soft tissue from the overlying gum into the defect/augmentation site.

This is important, because bone forming cells are in competition with soft tissue cells, but proliferate much slower than the latter ones. By covering the augmentation site with a membrane, bone forming cells are provided with a competitive advantage, i. e. place and time to build up the ridge/bony defect with new bone[6].
Membranes composed of collagen have been used as medical devices for many years. Collagens are a group of fibre-forming proteins that are widely distributed within the body and represent the main component of connective and supporting tissue. Animal collagen closely resembles human collagen and therefore, after its purification, shows a very good compatibility and healing. Collagen membranes are completely degraded by the body's natural processes[7].



Jason® membrane and collprotect® membrane –
NATURAL MEMBRANES MADE OF PORCINE COLLAGEN

botiss collagen membranes originate from different tissues of pigs. Porcine collagen has a particularly close analogy to human collagen ensuring a very high compatibility.

The collagen is extracted from German pigs destined for food industry. The multi-step purification process guarantees the security and compatibility of the material, while preserving the advantageous natural properties of the tissue. Throughout the production process the material is subject to strict quality checks. The membranes meet all international security standards.
Jason® membrane originates from pericardium of pigs, while collprotect® membrane is derived from the purified skin (dermis) of pigs. Both membranes completely resorb within a few months after application[8,9].

Bony defect following tooth loss | Filling of defect with bone substitute material | Covering of the defect with a membrane | Wound closure by suturing

collafleece® and collacone® –
SUPPORT OF WOUND HEALING

collafleece® and collacone® are sponges made of porcine collagen. They can be used for wound coverage or to stop bleeding after tooth extraction, and support wound healing in a natural way. Collagen sponges offer the advantage of a fast, complete degradation without secondary intervention for their removal.

Your attending dentist will advise you on the properties and advantages of the presented products.

This patient information was presented by:

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Innovation.

Regeneration.

Aesthetics.

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