The Foundation of Knowledge

1st Consensus on Corticobasal® Implants

(Ver 6.0: January 2024)

Due to the fact that medical devices and methods of their application are developing, also taking into account new developments in the nomenclature and possible applications, the International Implant Foundation IF® (Munich / Germany) first published the "Consensus on BOI" in 2006 in its own name and later developed continuously. (The first edition of this document was first published by Besch KJ: Besch KJ (1999): Konsensus zu BOI; Schweiz Monatsschr Zahnm, 109: 971–972).

The present document contains binding instructions for the assessment and use of basal and Corticobasal® jaw implants, which are implemented taking into account the respective national legal provisions.

1. Definition

- Lateral basal jaw implants transfer the chewing forces over and under horizontal base plates or rings into the cortical bone. The implants show a "dual integration" and in immediate loading protocols they enable the chewing loads to be reliably transferred to cortical bone areas even before the "osseointegration". Lateral basal implants enable intrusive and extrusive forces to be transferred into the bone
- Corticobasal® screw implants (e.g. BCS®, BECES®, Strategic Implant®) also belong to the group of basal implants if they are anchored laterally and medially bicortically (using IF® method 6) or in the second or third cortex. Resorption-stable cortical areas should preferably be used for anchoring. Screwable Corticobasal® implants enable the transfer of intrusive and extrusive forces into the second or third cortex, as well as into other cortical bone areas
- Implants which, due to their design, offer the possibility of bone compression along their vertical axis and which are also anchored in the second or third cortex (combination implants), also belong to the group of Corticobasal® implants

Active biological osseointegration along the vertical axis of these implants is not required for Corticobasal® implants to function. In the case of the lateral and screwable basal implant, the vertical implant part only has the task of connecting load transfer areas to the abutments. That is why these parts are kept as thin as possible and they remain polished. The primary stability achieved by osseous fixation of the apical thread is decisive for successful insertion and, in particular, for immediate loading. Later on, other parts of the implants can also „osseointegrate"; even those parts that were not previously fixed in place.

2. Classification of Corticobasal® implants

Description	Design	Mode of integration	Type of osteotomy
Lateral basal implants	Force transfer surfaces are intended for transmission of force to the cortex Thin, polished vertical implant sections Elastic implant design	1. Dual integration in the area of force transmitting discs 2. Gradual integration along the other vertical implant sections	T-shaped, lateral, bicortical
Screwable basal implants	Polished, cutting apically wide threads Thin, polished vertical implant parts Elastic implant design	1. Osseofixation of the force transferring thread 2. Gradual integration along the other vertical implant sections	Crestal, trans-cortical
Combination implants	Polished, sharp cutting apical threads Compression threads along the vertical axis of the implant Stiff implant design	1. Osseofixation of the force transferring thread 2. Compression of the cancellous bone along the vertical axis of the implant	Crestal, trans-cortical

3. Indications

Lateral basal implants

Availability of a sufficiently stable and usable first and second cortex as a horizontally aligned support. Jawbone quality and quantity according to Lekholm & Zarb (D1 - D4) and Paraskievich (D5 and D6).

Screwable lateral implants

Availability of at least one stable and accessible second or third cortex for basal anchoring. Or: availability of a lateral and lingual / palatal cortical anchorage according to IF® method 6. Or according to IF® method 14. Jawbone quality and quantity according to Lekholm & Zarb (D1 - D4) and Paraskievich (D5 and D6).

Combination implants

Compressible bone of quality D2 or D3, availability and engagement in at least a second or third cortex.

4. Aim of the treatment

The aim of every treatment with a Corticobasal® implant is to restore or maintain the ability to chew bilaterally evenly with the maximum possible aesthetics and support of the

perioral soft tissues. The preservation of "natural teeth" (in whatever condition) is not the aim of the treatment, as teeth are not absolutely (or not at all) necessary in order to be able to achieve the treatment aim. The inclusion of teeth is generally more disadvantageous.

5. Authorisation / Training / Re-training

Even extensive experience with crestal implant systems (2-stage / standard implants) is insufficient to understand the principles of Corticobasal® implantology or to be able to work with such implants. Therefore, extensive technology training (leading to implant manufacturer approval for use) and regular refresher training are required for safe and optimal use of these medical devices. The International Implant Foundation IF® supports this sensible demand, which in many countries is also based on national laws and regulations.

Leading government organizations (e.g. Swissmedic / Bern) that deal with the monitoring of medical devices support this view of the International Implant Foundation IF® and the relevant manufacturers. Requests for authorization (instruction) and other precautionary measures were taken with a view to maintaining the patient's health (patient protection) and because the technology used differs very significantly and not obviously from other "dental implant" products on the market. The validity of the briefing is monitored by the local health authorities. If there is no authorization to use the products, the doctor works virtually "without a license". "Use of the product" includes: patient information, surgical therapy, prosthetic therapy, maintenance therapy, troubleshooting, removal and replacement of implants.

6. Training

The training for the Corticobasal® technology is carried out exclusively by teachers / trainers with a valid teaching certificate or by the manufacturer himself. Teachers / trainers can also be associated with government institutions such as universities[1].

7. Expert evaluators

Expert evaluators who assess patient cases in which Corticobasal® implants are involved (reimbursement cases, liability cases) must have a multi-year approval for the use of the relevant lateral / Corticobasal® implants and have 50 fully completed treatment cases, 25 of which are at least three years or must be older. The German Federal Court of Justice has generally confirmed the requirement of personal experience for experts in III ZB 98/18 (06.06.2019).

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1 A job for a university alone, even a completed "doctorate", a "professorship" or the appointment as a "privy councilor" are not enough to be able to use the product without in-depth product training or without regular refresher training.

(The Federal Court of Justice writes: When selecting dental experts, the courts are required to use experts who have the necessary medical expertise and thus special training and experience in the relevant field).

8. The preparation of the implant bed

Lateral basal implants

Both turbine and high-speed contra-angle handpieces are used for lateral basal implants. Contra-angle handpieces with a 1: 1 ratio can also be used with at least 4,000 rpm and good cooling. Contra-angle instruments with a transmission of 1:10 or even 1: 248 are unsuitable for bone preparation for lateral basal implants, unless the surgical motor delivers at least 20,000 rpm.

Screwable basal implants and combination forms

Straight handpieces or contra-angles are used with at least 5000 rpm. For better tactility, low-speed processing is also indicated in border areas. Surgical turbines can be used in any case, especially to prepare a first drilling and to model the first cortex. Each implantation takes place with local intra-oral disinfection, e.g. with Betadine® 5%. Oral antibiotics are only an option, unless common medical conditions call for such a drug.

9. Combinations of elastic Corticobasal® implants with natural teeth and crestal implants

Lateral basal implants (as well as long screw implants / BCS®) have considerable structural elasticity and can be used with stable teeth in the same prosthetic construction. A disadvantage of this combination is the typically shorter lifespan of the affected teeth compared to the implants. Patients should be informed about the disadvantages of this combination and about the risks. In addition, it must be taken into account that failing teeth create an undesirable and often for a long time hidden lever on the bridge structure. This may lead to the failure of implants due to overlading of the adjacent bone.

The International Implant Foundation IF® supports treatments with constructions that are connected to implants only. Whenever possible, cases should be handled according to the standards; i. e. with circular bridges (with a dentition 6-6 in both jaws) or with standard segments (with implants in areas 4 -7 and prosthetic supra-structures installed from 4-6), without the inclusion of teeth.

Combinations of Corticobasal® implants with 2-stage crestal implants (placed according to the Method of Osseointegration) are possible, but if they are included into the same prosthetic construction, this can lead to critical problems. The different elasticity between cortical / basal implants and (especially long term integrated) crestal implants creates frequent problems to the freshly placed implants.

If such a combination is planned, the result must be a rigid construction to avoid overloading, fractures and decementation on the rigid, 2-stage pillars. When planning the combination of Corticobasal® implants with 2-stage, crestal implants, a thorough assessment (X-ray and clinical inspection) of the crestal implants should be performed to define their prognosis for the presence or future occurrence of periimplantitis. Whenever possible, 2-stage implants should be removed. These implants carry in any case the immanent risk of developing a periimplantitis sooner or later.

10. Loading protocols and immediate loading

Lateral and screwable basal implants are usually used in immediate loading protocols. This means that the prosthetic splinting through the bridge or bar takes place before the third postoperative day. Stable temporary bridges, bridges with a metal frame or internal rigid reinforcement, direct laser welding and various veneers are used for splinting. Recently, successfully milled composite frameworks (or PMMA frameworks) have also been used without a metal framework. There are no long-term results on this yet. Bridges made of PEEK or PEEK compound without metal reinforcement are not recommended unless the design of the bridge provides sufficient stability. If there is very little bone available, immediate restoration (splinting) is necessary on the day of the operation, i. e. the 3-day rule will not apply. When combined with compression screws and there is enough bone around the lateral basal implant, the prosthetic construction with permanent cement can be inserted on the fifth postoperative day at the latest. Whenever possible, support in the distal upper jaw should be in the third cortex. This consensus does not include treatment modalities for maxillo-facial applications.

11. Methods / Disciplines

In 2018, the International Implant Foundation IF® published an S3 consensus document on the 16 methods of strategic implantology. Earlier versions of this document have been implemented in practice and teaching since 2014. This document describes the tried and tested and scientifically validated applications of Corticobasal® implants in the various areas of the mandible and maxillary facial skeleton.

12. X-ray assessments and implant loosening

Implant placement in periodontally or endodontically infected areas: The insertion of large (cartridge-shaped), roughened crestal implant bodies into infected areas of the mucous membrane or bone areas in which an infection is suspected is generally not recommended.

The long-term observation of treatments with the Strategic Implant® with a smooth surface and thin vertical implant components shows the following differences to the conventional crestal implant bodies: Polished Corticobasal® implants in periodontally affected oral cavities are promising (statistically often even more promising than implant insertions

in healed jaw regions), as long as they are soft tissues that have changed due to inflammation are removed at the same time and all affected teeth are also removed. Combination forms, on the other hand, should not be used immediately after tooth extraction if the case shows advanced periodontal involvement.

Treatments with Corticobasal® implants can be carried out immediately after tooth extraction, provided that a stable second cortex is available for anchoring and when it is actually used. The principle of conventional implantology "no implant insertion in an infected area" does not apply to the Strategic Implant® technology.

Local disinfection of soft and hard tissue, e.g. with Betadine® is urgent, while the general oral or intravenous antibiotic therapy is only indicated in individual cases (this statement only applies to completely healthy patients). The advantages and disadvantages of antibiotic therapy can be discussed with the patient in order to make a decision.

13. Incorrect loading due to laterotrusion and pre-contacts

Lateral forces and vertical overload caused by chewing can lead to a sterile loosening of the apical thread of the Corticobasal® implant or the base plate of the lateral basal implant. This condition is potentially reversible if the overload is corrected early and the bony interface to the power transmission areas is not infected.

14. Indications for the removal of screwable and lateral basal implants are given, if:

- Radiographically, a sharp, circumferential demineralization zone is visible all around the base disc or the apical thread of the implant
- The implant can be moved vertically
- Retrograde osteolysis is shown and recognizable on the X-ray, and osteolysis is visible around the entire apical thread
- When osteolysis is visible on a first X-ray and its size increases on a second radiographic image after more than six to eight weeks. Removing implants after just one X-ray is sometimes premature
- When vertical bone defects larger than 5 mm occur between the shafts of two adjacent implants in the area of the first cortex and below. In this case, the implant with the poorer prognosis or higher mobility is removed
- With combination implants, the vertical portions of the implant surfaces show a loss of osseointegration. If the X-ray shows crater-shaped bone loss, early removal of the implant should be considered (as in all other cases of periimplantitis)

15. There is no indication for (immediate) removal of the implant if one or more of the following observations can be made:

- A black line between the implant and the surrounding bone only affects the vertical implant surface (and not the threads or baseplate) for basal implants. Swelling and

/ or abscesses are present in the vestibular, lingual, or palatal mucosa
- The implant is painful to chew, but there is no sharply defined black area around the basal disc or apical thread
- In the presence of crater-shaped bone loss around lateral basal implants, as long as the basal discs are not affected
- Only parts of the bone around the basal plate show blackening in the X-ray image; i. e. the plate or ring is still in contact with bone, even if its mineralization has decreased and / or in some places is not visible at all on the X-ray
- Only the bone around the crestal discs is affected radiologically by demineralization
- There is only lateral mobility. (The reason for this movement can be: lack of integration of vertical implant sections; elasticity of the long and thin implant axis or in the area of the second or third cortex)
- Screwable basal implants rotate in the bone

16. Resistance to periimplantitis

Long-term observation of treatments with the Strategic Implant® (which has a completely smooth surface and a thin vertical mucosal penetration site) has shown that this implant is resistant to the development of periimplantitis. No periimplantitis is observed around the smooth and thin implant neck. However, in some cases, peri-implant mucositis can occur. Usually this is due to the prosthetic components, including when cement is left in close proximity to the gums. This is NOT an indication for removal of the implant; instead, some adjustments could be made to the bridge and / or a gum resection performed.

17. The transition area between the head of the implant and the denture

Unless the treatment provider chooses open surgical cementation as a form of therapy for the cementation of metal-ceramic bridges in cases in which the abutments were deliberately inserted deeper into the socket, the length of the crown is chosen so that there is no risk of cement residue be dislocated under the mucous membrane or into the empty alveoli. The transition zone between the abutment of the implant and the crown margins should therefore not be subgingival. It is therefore not a goal of prosthetic treatment in Corticobasal® implantology that the lower edges of the crowns match the maximum diameter of the polished abutment, and therefore the "fit" of the crown cannot be assessed using this parameter. If the edges of the crowns are above the gingival level, there is no need for a special or precise fit as long as the cementation is stable.

Approved by the Board of Directors and the Scientific Advisory Board of the International Implant Foundation IF®: Ver 6.0 EN, January 2nd 2024.

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Change No.	Document Name / Number	New Version	Previous Version	Change	Date Approval	Approved by
1	1_EN_Consensus_on_basal_implants_2024-01	6.0	5.2	*"10. Indications for tooth removal to enable the use of the Strategic Implant® / Corticobasal® implants..."* removed because this information has been integrated into the new IF® consensus document No. 9	02.01.2024	IF® Board