The Foundation of Knowledge

Indications and treatment modalities with Corticobasal® implants

(Version 2, March 2021)

Definition of Corticobasal® Implantology:

Corticobasal® implantology is a method or technology that works with Corticobasal® implants in order to establish a bone-implant prosthetic system.

Definition of Corticobasal® implants:

Corticobasal® implants are implants that are osseous fixed in cortical bone areas with the intention of using them in an immediate loading protocol. The "Consensus on Basal Implants" (2018) of the International Implant Foundation refers to such Corticobasal® implants.

Technological concept of the Strategic Implant®:

From a technical point of view, the therapeutic concept of Strategic Implant® (Corticobasal® implantology) is identical to the corresponding therapeutic concepts in osteosynthesis, maxillo-facial traumatology or surgical orthopedics. In contrast to conventional dental implants, which are used according to the "osseointegration" method, Corticobasal® implants are osseointegrated in at least one cortex by the practitioner; its success does not depend on any subsequent "osseointegration". The "osseointegration" can and will take place by itself over time along all endosseous implant parts, since the implant contains very large amounts of titanium. Due to the great differences between the osseointegration method and the osseofixation method, we cannot expect the rules, indications and contraindications of conventional dental implantology to apply to treatment with Corticobasal® implants. A more logical step would therefore be to adapt the rules and principles from traumatology and surgical orthopedics to the field of Corticobasal® dental implantology. Once this is done, new and very clear and logical rules and guidelines come to mind and should be followed with these types of implants.

It is only logical that in Corticobasal® implantology the rules and principles from traumatology and surgical orthopedics are adopted and adapted. As soon as this path is taken, new and very clear and logical rules and guidelines are imposed and these rules must be followed with Corticobasal® implants.

This consensus document describes the use of Corticobasal® implants, which have proven to be far better and more effective than conventional "osseointegrated" dental implants. However, it also describes various aspects to be considered in this form of treatment, including situations in which special care is required or in which the treatment plan needs to be adjusted.

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1. Classification of endosseous implants

Implants for use in human bone can be assigned to one of two main groups, which differ fundamentally:

Type of Fixation Fields of application	Implants to be stabilised by osseo¬integration with or without immediate loading (conventional dental implants)	Implants to be stabilised by osseofixation and for immediate loading
Non-dental medical fields	n/a	Trauma devices; orthopaedic implants; fracture plates and screws; some implants for joint replacement (all designed for use within or on the human bone)
Dental field	Conventional two-stage-implants; two-piece-implants; blade implants; one-piece compression-screw implants (designed to compress spongious bone areas) designed for use in the human jawbone. One-piece or two-stage compression-screw implants, designed for initial stabilisation by compressing spongious bone areas and subsequent osseointegration.	One-piece or two-piece implants for Corticobasal® osseofixation

Table 1

Classification of implants for use in human bone compared to components used in traumatology and orthopedic surgery. This comparison applies to both the surgical steps of treatment and corrective measures aimed at restoring stable cortical anchorage.

Note:

When looking at the Corticobasal® zygomatic implants (according to IF method 12) and the glabella support newly introduced into the profession (currently no IF method), it becomes clear that a demarcation between these dental implants and maxillofacial-traumatological aids is not possible.

2. Definition of the term "(implantat-)system" when used for conventional dental implants and for the category of Corticobasal® implants :

The term "implant system" refers to the different components of dental implant systems, which can come from the same or different manufacturers, but are generally compatible with one another. When comparing the implant system described in conventional implantology with the implant system used in Corticobasal® implantology, fundamental differences can be identified, which are described in Table 2. Systems in conventional dental implantology:

Systems in conventional dental implantology	Bone-implant-prosthetic-system (BIPS) for Corticobasal® implants
The term "implant system" refers to components of dental implant systems that come from the same manufacturer or are generally compatible with one another. An implant system consists of implants, tools, abutments, accessory screws, laboratory parts and auxiliary parts as well as prosthetic screws for temporary and permanent restorations as well as gingiva formers.	The conceptual basis of Corticobasal® implantology is the bone-implant-prosthetic system as a unit. There can be one or more bone-implant prosthetic systems in a jaw. The movements of the jawbones relative to one another are guided by cusp slopes that are part of the bone-implant prosthetic system. The relative position of the lower jaw in the joint centric is determined by occlusion stops. The joint centric and the occlusal centric must be achieved at the same time. The muscle forces must be strengthened or maintained in such a way that they enable a safe long-term function of the bone-implant-prosthetic system. Individual implants contribute to the functioning of the system just like the dentures and the bones. Each component of the system has its own task to perform. With the help of implants, the second or third cortex is connected to the occlusal and chewing surfaces. In Corticobasal® implantology, "osseointegration" on or under the first cortex is neither important nor necessary for the functioning of the bone-implant prosthetic system. The implantologist decides which cortex is best suited for the creation of the respective bone-implant prosthetic system and what the planning for each individual implant in the system should look like. He also decides which components can be removed and replaced or removed without replacement if necessary.

Table 2
Revised definition of the term "implant system".

3. General medical contraindications for osteosynthesis and comparison with Corticobasal® implants and bone-implant prosthetic systems

When considering Corticobasal® (jaw) implants and their similarity to traumatological aids (in design, application and therapy concept) and devices for surgical orthopedics, it seems logical to consider the experiences and rules of traumatology with regard to indications and contraindications.

"An internal fixation is contraindicated if it is of no benefit compared to conservative therapy."

Application in the field of oral (dental) implantology :
The conservative treatment options for edentulous patients consist of either leaving the patient edentulous or incorporating removable dentures (prostheses).

Very few young patients who have had full prostheses prefer these prostheses to fixed restorations on implants – which remains unaffected for them. On the other hand, most adult patients today will try to avoid prostheses at all costs. According to the literature, many patients are still dissatisfied with their removable prosthesis – even though most prostheses are perfectly designed and comply with all clinical specifications.

Today we know – and this is supported by the scientific literature – that treatment with Corticobasal® implants has many advantages over conservative therapy for the treatment of edentulous patients such as mucosal-supported prostheses or non-treatment of completely or partially edentulous patients.

"Osteosynthesis is contraindicated in patients with severe health problems or who are at high risk of surgical failure."

Significance for our area of expertise:
If a patient has been diagnosed or reported to have a general illness, the patient's general practitioner should be consulted before starting implant treatment. General diseases can be local or generalized.

Generalized diseases cover a wide field, for example:
Cardiac diseases; Cancer of the mouth; Radiotherapy; current or previous chemotherapy (especially those targeting the bones, such as bisphosphonates); Long-term therapy with drugs that affect bone physiology or reduce the patient's resistance to infection.

Certain general diseases as such have no influence on the success of the implant, however, therapy for these disorders may interfere with implant treatment or be a contraindication. A typical example of this is Crohn's disease. Since the associated side effects are not present in all patients, the decision for or against treatment must be made on a case-by-case basis, following the advice of the treating specialist.

Intravenous bisphosphonate therapy:
Bisphosphonates are chemotherapy drugs that act on the bones. According to the current literature, they can pose a risk to the mechanisms of the Strategic Implant® (Corticobasal® implantology), which is why we recommend excluding the affected patients from implant treatment for at least a certain time after the last intravenous administration. The biological half-life of these drugs is often more than 10 years. Therefore, treatment with all types of dental implants should be postponed significantly. The concentration of the drug in the jawbone cannot be measured or estimated.

Unfortunately, bisphosphonates are now often prescribed to treat osteoporosis. An increasing part of the population is now "contaminated" with bisphosphonates. Orthopedic surgeons who administer bisphosphonates to support bone surgery and the subsequent treatment of artificial joints often fail to take into account the fact that dental implantology is performed in a septic environment and that infections can exist in the bone or can spread along the surface of the implant in the bone (e.g. in "natural"/"physiological" bone loss or in periimplantitis). Therefore, the penetration sites of the implants must primarily be viewed and treated as open (bone and soft tissue) wounds, even if polished implants are used.

"Special contraindications may exist in the presence of unfavorable conditions, such as B. tumor activity (cancer), diseases of the skin or soft tissue, massive swellings (e.g. after accidents) or local disorders of the arterial or venous blood flow (e.g. a compartment syndrome)."

Significance for our area of expertise:
Implant therapy is contraindicated or postponed if cancer has been diagnosed on or in intraoral soft and hard tissues, or if soft tissue areas are destroyed or severely damaged. Treatment of the tumor and life support have priority. However, it is ethically justifiable to treat terminally ill patients (on request) with dental implants and fixed prostheses, preferably minimally invasive with immediate loading.

Severe periodontitis – especially with massive and persistent nicotine abuse – can be another complication. Heavy bleeding may occur intraoperatively. Such diseases can, however, be successfully treated before implant treatment is carried out. This therapy is usually given at the same time as the implant placement and includes removal of the infected soft tissue and the administration of antibiotics. The care of the affected soft tissue is important for the success of the treatment.

Diseases of the tissue that can be traced back to mechanical irritation such as ill-fitting prostheses (e.g. mild leukoplakia), e.g. mild prosthetic hyperplasia (prosthetic hyperkeratosis; deep infections of the mucosa due to long-term use of adhesives) tend to heal or weaken, as soon as the mechanical irritation from the dental prosthesis has ceased after implant-supported bridges have been incorporated.

If only one jaw is restored – especially if total prostheses in the upper jaw have been replaced by a bone-implant-prosthetic system supported by Corticobasal® implants – patients can temporarily (up to several weeks) experience pain from hypertrophic soft tissue that only contracts later. Hypertrophic soft tissue pain can also be caused by uncured cement, even if the cement is later removed. Cements can spread into the folds of hypertrophic or hyperkeratinized soft tissue areas. Patients who experience pain should be encouraged to increase their efforts to maintain good oral hygiene; Regular intraoral disinfection is also recommended until soft tissue strength and quality have normalized. This pain may be related to changes in blood flow to the soft tissue under the dentures, and previous irritation and changes in tissue quality from the use of adhesives.

General dentists are generally not aware that removing prostheses, especially in the upper jaw, without the incorporation of a new removable mucosal-supported prosthesis, alone or in combination with minor mucosal penetration, causes persistent pain and extensive restructuring of the soft tissue (which can take many weeks to heal) can.

Such transient pain seems to be more common in patients with high chewing forces

and bruxers. Long-term use of adhesives prior to implant placement can exacerbate this condition.

Interestingly, patients with preoperative deep pockets or even highly infected periodontal tissue do not experience pain of this kind, since all periodontally involved tissue is removed after the extraction and before the (simultaneous) implant placement.

**"Osteoporosis can pose major challenges for osteosynthesis.
It can interfere with stable fixation or prevent it entirely."**

Significance for our area of expertise:
Fortunately, osteoporosis hardly affects the jawbones to the same extent as the long bones, the spine, etc. However, spontaneous fractures of the lower jaw in severe osteoporosis have been described after the placement of lateral basal implants. Such fractures typically occur six weeks after surgery. This shows that the deterioration in the mechanical properties of the osteoporotic bone was caused by post-traumatic remodeling of the bone; physiological mechanical stress (with subsequent expansion of micro-gaps) will then contribute to damage to the bone.

Fractures of the mandible after the placement of Strategic Implants can occur with severe atrophy of the alveolar ridge, when the caudal (basal) cortex of the distal mandible is completely pierced by the drill (i.e. when **IF method 5a or 5b was not used**) or when the force-transmitting threads of the implants are too close together or even touch. In these cases, local or generalized prosthetic overload increases the extent and extent of crack formation and the spread of these microcracks .

Recommendation:
When treating patients with osteoporosis, it is strongly recommended **that the drill does not penetrate the basal cortex of the distal mandible for all implants**. Instead, an oblique implant insertion into the lingual and vestibular cortex is advisable **(IF method 5a, 5b)**. An increase in abutments, i.e. an increase in the number of implants per jaw, should be considered in order to use more cortical parts and to ensure a better distribution of forces.

"Osteosynthesis may be contraindicated in osteomyelitis."

Significance for our area of expertise:
Osteomyelitis is an infection of the bone tissue. While decortication is the common surgical therapy for osteomyelitis, the insertion of osteosynthesis plates and screws can cause the disease to spread into bones. Decortication triggers the formation of a new cortex, often the formation of plexiform bones or other types of bones of periostal origin.

Pre-existing intraosseous infections (i.e., infections in the bone but not the bone) such as B. Periapical granulations should be removed and the area disinfected (with Betadine® 5 to 10%). The area that ensures mechanical retention of the Corticobasal® implant will definitely have to extend beyond the affected areas into the second or third cortex.

Recommendation:
Treatment of patients with evidence of active osteomyelitis should not be initiated. Any treatment with one-piece implants should be viewed as an "open flap" treatment. Therefore, necrotic areas of bone can become superinfected through the osteotomy slot.

Since non-resorbed augmented areas within or adjacent to the bone are to be regarded as "non-vital" substances whose surfaces can be easily colonized by bacteria (just like bone areas affected by osteomyelitis), one-piece implants can be used in these areas for colonization of all for augmentation materials used, which then remain unabsorbed. We know, however, that in the vast majority of cases where a portion of the implants for making a bone-implant prosthetic system are inserted into the previously augmented bones, no clinical problems arise.

Unfortunately, some of the materials that the manufacturer describes as "resorbable" appear to be non-resorbable in clinical reality or, in individual cases, cannot actually be resorbed for a wide variety of reasons.

Malformations of blood vessels in the jaw, such as aneurysms are also a contraindication for the technology of the Strategic Implant®, even if the implant could reach the second cortex.

Recommendation:
Treatment under these conditions can lead to massive, insatiable bleeding, which is why the underlying disease must first be treated successfully.

Patient's medication history:
It is not possible to give clear advice or guidelines on how to consider the medication prescribed to a patient. Elderly patients are often given more than one medication at the same time. These drugs have usually not been clinically tested in the prescribed combination. It is therefore not possible to estimate whether the respective combination of drugs has an influence on the treatment with Corticobasal® implants.

Recommendation:
Multimorbid patients (who must take many different drugs every day) must be informed that their prognosis for implant treatment is unpredictable and that they must be prepared for surprising reactions and difficult situations.

Local general or dental conditions that may affect treatment include:
High chewing forces and pronounced parafunctions, especially in connection with the mas-

seter muscle. If these are diagnosed, this may require a prophylactic reduction in the chewing forces, e.g. with the help of botulinum toxin. It is imperative to have a correct implant treatment plan that enlarges the functional areas and provides better force distribution. If the disease remains unnoticed until the cortically anchored implants become mobile due to overloading when chewing or due to bruxism, an immediate attempt at treatment with botulinum toxin is indicated. The prophylactic and therapeutic use of botulinum toxin is carried out by bilateral simultaneous injection into the Mm. masseter. Treatment of the Mm. temporalis also needs to be considered in some cases. This therapy is usually accompanied by changes in the bite situation (e.g. the lower jaw position), which must be monitored and, if necessary, corrected.

One-sided and anteriorly stressful chewing habits should be corrected before implant treatment in order to ensure an even distribution of the chewing forces, to prevent overloading of the implant on the working side and to avoid an implant loss on the non-working side.

If **extractions** are to be performed before or in combination with immediate implantations, the indications and contraindications for the extractions must be considered separately (see below).

Acute maxillary sinus infection(s) This condition may require treatment to be postponed. A prophylactic intervention by an ENT surgeon is recommended in more severe cases to ensure a more stable and successful airway passage into the maxillary sinuses or, if necessary, to bypass the maxillary sinus by using **IF methods 6, 7A** and **10** without penetration. But even if the sinuses appear sufficiently or well ventilated on a preoperative CT scan, there is still no guarantee of permanent or sufficient air passage through the natural ostium after a surgical procedure on the sinus floor. From the literature it can be concluded that polished implant apices that penetrate the sinus do not trigger sinus infections, nor do they promote or delay them.

Significance for our area of expertise:
In the case of a general illness, the treating specialist can provide valuable information about the patient's condition and the necessary precautionary measures before, during or after the implant treatment.

In this way, some of the responsibility is shared with the specialist treating the general condition and should approve our oral implant treatment plan. Written communication with the specialist is recommended for legal reasons.

It should be noted that although many diseases themselves do not make treatment with dental implants difficult or endanger it, the (medical/radiological) treatment carried out or the medication taken are contraindications or can otherwise complicate or influence the treatment result.

4. Smoking

In the case of heavy smokers, we have to check whether the chronic toxic influence of nicotine in combination with persistent periodontal disease has already led to changes in the soft and hard tissue before the implant treatment. Since this can increase the risk of intraoperative bleeding, this influence also affects tissue healing and makes it all the more necessary to inform the patient not only about the general risks such as precancerous diseases and tumor lesions, but also about the additional risks of the treatment.

Smoking per se is not a contraindication for treatment with the Strategic Implant®. On the other hand, smoking in combination with chronic periodontal disease, ill-fitting prostheses and other chronic iatrogenic irritations can lead to potentially malignant lesions (precanceroses), which carry the risk of intraoral carcinoma. In this case, the existing disease should first be cured. It should be noted, however, that damage to the intraoral soft tissue from this cause cannot be eliminated without the removal of mobile dentures.

Heavy smokers tend to neglect the risks associated with their addiction. Regarding the treatment of smokers with implants placed in or through the maxillary sinus, it should be noted that heavy smokers usually have extremely thin Schneiderian membranes and that they tend to have the sinuses free of congratulatory tissue, polyps or mucoceles. From this point of view, they are ideal candidates for this treatment variant. Smokers therefore particularly benefit from the introduction of the Strategic Implant® technology, as they are not good candidates for bone augmentation and their conventional implant treatment is therefore often rejected.

Smokers are more likely to dissolve the callus that has formed in the extraction socket. To reduce the chances of this leading to clinical problems, simultaneous extraction and implant placement in heavy smokers (prophylactic or therapeutic) can be treated by vertical reduction of the alveolar bone and vestibular decontamination of the alveoli, followed by tight suturing. If vertical bony recessions and thin bony craters are not removed during the procedure, the subsequent soft tissue and bony recessions tend to impair the aesthetic result, as vertical parts of the implant become visible as a result. However, this does not affect the prognosis of a Corticobasal® implant anchored in the second cortex. The condition described here is similar to pseudarthrosis in the field of traumatology, and therefore the same surgical steps (e.g. debridement) are used to treat it.

5. Diseases that prevent extractions, implant placement or the formation of small-area flaps

We want to look at this issue from a new angle, carefully considering the following situations:

- In which situations would we decide not to remove a previously damaged tooth due

to the poor general condition of the patient or a lack of equipment or standards in the dental office?
- Is this limitation a problem in the private dental practice? Could this restriction be in a specialist clinic, e.g. B. a multidisciplinary medical center?
- What could be done better or safer in a specialist clinic than in a private dental practice?
- What are the main reasons for preventing extractions from taking medication or other substances?
- Could a change in medication or dose change (if possible given the patient's health condition) or delaying treatment reduce the risk of extractions and implant placement?

5.1 Medical considerations

If one considers the challenges and risks of routine tooth extraction, it becomes clear that minimally invasive Corticobasal® implants can also be inserted in severely impaired health. **The insertion of a Corticobasal® implant in a flapless procedure is much less invasive than any extraction**.

5.2 Equipment and environment considerations

With the help of strong local disinfectants (e.g. Betadine®), implants can be inserted under almost sterile conditions, even if the overall hygienic status of the oral cavity (or the dental practice) is questionable. Local disinfection is far more important than "treatment" with antibiotics. In the presence of acute or chronic periodontal disease, the insertion of conventional dental implants is a measure to be assessed as doubtful, and implant losses are frequent. The reason for this is believed to be that rough implant surfaces can easily be contaminated with bacteria and there is a risk that the blood clot (necessary for the primary healing of the bone around the implant) will be lost. This relative contraindication does not exist with Corticobasal® implants because the polished surfaces can hardly be contaminated and because the osseous fixation in the second or third cortex gives the implant sufficient stability in the infection-free bone until the soft tissue has closed and the bone compartment is resealed.

Sterilization of implants and instruments using dry heat in addition to local disinfection of the oral cavity enables treatments with Corticobasal® implants for use even in the most remote corners of the world and in clinics with minimal equipment. In general, a Corticobasal® implant can also be safely inserted in any normal dental practice in which a tooth can be safely extracted, as its polished surface prevents periimplantitis.

6. Comparison between the anesthesiological boundary conditions for the insertion of Corticobasal® implants and for surgical interventions in traumatology and orthopedics

Traumatological and orthopedic surgical interventions are performed under general anesthesia; they can only rarely be performed under local or epidural anesthesia, possibly

because operations on bones outside the skull often require the patient to be kept in a special position and very good asepsis. Patients whose state of health does not permit treatment under general anesthesia should therefore generally be excluded from these measures.

However, the aforementioned basic restriction does not apply to dental implantology. Some patients prefer implant treatment under general anesthesia, analgesic sedation or intravenous sedation anyway, but these are not necessary for the insertion or the success of the implants and are only used in view of the patient's fears.

7. Comparison between rules/recommendations for load distribution in the maxillofacial area and force distribution on Corticobasal® implants by the bone-implant prosthetic system

"The force-bearing pillars of the midface are aligned in such a way that they mainly withstand forces in the longitudinal direction and can offer less resistance to forces acting across or diagonally."

Significance for our area of expertise and recommendation:
Depending on the quality of the bone supply and the achieved insertion torque for circular bone implant prosthetic systems, ten or more non-parallel implants are inserted in the upper jaw in order to counteract diagonally acting chewing forces and not to overload the weaker cortical parts (compared to the lower jaw); at the same time, the chewing forces are transferred to the pillars of the midface. Eight Corticobasal® implants or fewer may be sufficient in the lower jaw. In general, it is recommended to have too many implants rather than too few implants in a jaw. This strategy allows individual implants to be removed without replacing them, should this ever become necessary.

8. Types of Corticobasal® implant failures and countermeasures
Corticobasal® implants generally do not fail due to periimplantitis, as cavitating bone loss cannot develop around their thin vertical shaft if the position of the implant in the jawbone is correct.

Complications that can cause individual implants (or later multiple or all implants or the bone-implant prosthetic system) to be lost include:

- Chipping of thin areas of bone during surgery. This can also go unnoticed, especially with flapless interventions. Such chipping also occurs in the area of the second or third cortex.
- Fragmentation of the cortical bone areas when inserting or bending the implants.
- Chipping of thin crestal bone areas due to implant and bridge mobility.
- Fracture and subsequent necrosis of cortical areas of an extraction socket, which prevents the primary healing of the implant site.

- Retrograde osteolysis due to existing infections in the bone or due to the embedding of foreign bodies (chips of ceramic, tartar, etc.) when screwing in the Corticobasal® implant or due to necrotic bone areas around teeth that have previously been treated with root canals. This situation occurs mainly in the lower jaw.
- Overload osteolysis (initially sterile, but can be overlaid by an infection if left untreated for a longer period of time): While periimplantitis (with conventional dental implants) would affect the crestal parts of the implant, overload osteolysis affects the load-bearing parts (thread or Baseplates) in the second or third cortex. Such overload osteolysis usually occurs within two years of implant placement.
- Necrosis of bone tissue due to overheating when drilling.

Significance for our area of expertise and recommendation:
The complications that may require general medical treatment after the insertion of Corticobasal® implants include:

- Infections in the floor of the mouth after placing Corticobasal® implants according to IF method 5a. Antibiotics should be given immediately. Surgical treatment (intraoral) or, better still, extraoral incisions should be considered. If the disease is due to an injury to the submandibular gland, delayed healing is expected (8 to 14 days), but incisions are not required.
- Infections and retained granulation tissue that impede ventilation of the maxillary sinus are best treated with FeSS intervention (of varying degrees), unless antibiotics and topical treatment already provided rapid relief.

Possible prophylactic measures to avoid these complications include:

- Use of strong antiseptics (e.g. Betadine®) before and during the procedure; they are inserted into the soft tissue, the bone (osteotomy slot) and applied to the implant.
- Preoperative professional tooth cleaning as well as debridement of granulations and infected soft tissue.
- Radiological check-up (OPT or DVT).

In an overload osteolysis, one or more (prosthetically overloaded) implants become easily mobile, which also increases the mobility of the prosthesis, and most or all of the other implants in the same bone-implant prosthetic system are overloaded as a result. This phenomenon is known as propagated congestion. Without a quick and thorough correction with grinding in the occlusion, all or most of the implants can be lost and the patient has to be completely re-treated. However, if detected and treated early, overuse osteolysis can be a reversible phenomenon .

A **propagated overload** is also often observed when bone-implant prosthetic systems are exposed to mechanical trauma in the first two years after implant placement and subsequent prosthetic restoration. There is no correlation between the type of trauma, the location of the trauma and the order and number of implants affected by the

prosthetic instability. If correction is delayed, the overload spreads to all implants in the same prosthetic bone-implant system. Nevertheless, you should take some time to wait for possible self-healing after accidents or after premature chewing overload (e.g. after unexpected repositioning of the lower jaw in the real joint centric or out of the joint centric).

Botulinum toxin can be used prophylactically to avoid overload osteolysis around the load-transferring surfaces of the implant. This application must be combined with an adequate prosthetic loading concept.

Appropriate treatment includes:

- Bite elevation to remove the anterior teeth from the occlusion.
- Adding more implants to the existing bone-implant prosthetic system, possibly without removing the prosthetic restoration.
- Removal of those implants from the bone-implant prosthetic system that are not expected to be involved in the transmission of occlusal forces into the depths of the cortex (due to extensive osteolysis around the load-transferring part of the implant and a proven or assumed vertical mobility of the Implant).
- Reduction of the acting chewing forces (at least temporarily) with the help of botulinum toxin.
- Removal of blocking cusps (interferences) in the prosthetic restoration in order to avoid or at least reduce forces that occur during laterotrusions of the restoration during chewing.
- If the practitioner decides to switch from an elastic to a rigid bone-implant prosthetic system, this step must be carried out in the entire jaw.

9. Product and technology training for practitioners

Even practitioners who have extensive experience in the field of two-stage implantations require individual product and technology training.

As already stated in the “Consensus on basal implants“ (Besch K., Schweiz. Monatsschr. Zahnmed. 1999) and in later, updated versions of the consensus, Corticobasal® implants differ significantly from “conventional dental implants“. Differences arise with regard to the use, attachment, indication, maintenance and replacement options, the use of tools and the possible connections to natural teeth and conventional dental implants (Table 1).

Both the practitioner and the conventional implantologist need intensive theoretical training and personal experience to work with and evaluate bone-implant prosthetic systems on Corticobasal® implants.

Training and experience in connection with conventional implants (designed for osseoin-

tegration) do not help to understand the principles of Corticobasal® implants and to be able to work with them. **Most of the rules of conventional dental implantology are not applicable to Corticobasal® implants.**

It is therefore advisable to restrict the sale and use of Corticobasal® implants to specially trained and further educated practitioners. The International Implant Foundation does not recommend restrictions on the use of Corticobasal® implants solely by maxillofacial and oral surgeons. These two groups of specialized dentists would definitely need specific theoretical and surgical training as well, and they would also need intensive prosthetic training.

Corticobasal® implantology is a prosthetically oriented discipline in dentistry and is based on clear rules for the surgical part of treatment[1].

1 Consensus on basal implants (1999, 2006, 2015, 2018, 2021), International Implant Foundation, Munich, Germany.