

CONSENSUS REGARDING 16 RECOGNIZED AND CLINICALLY PROVEN METHODS AND SUB-METHODS FOR PLACING CORTICOBASAL® ORAL IMPLANTS^{1, 2}

In an effort to define standardized treatment methods, the International Implant Foundation (Munich/Germany) publishes this **Consensus Document** on 16 clinically successful anchoring techniques for Corticobasal[®] oral implants.

This consensus document describes only the proven methodsⁱ, without recommending a specific number of implants per jaw or per segment. It is understood however that the number of implants used will by typically higher compared to treatment plans in conventional dental implantology.

Level of evidence: S3 (evidence based, systematically developed consensus guideline)

Other applicable rules and documents:

- General rules for treatments in the field of traumatology and orthopaedic surgeryⁱⁱ.
- IF Consensus Document 2019: Indications and treatment modalities with Corticobasal® jaw implants. Ann Maxillofac Surg 2019;9:379-86.

GENERAL METHODS

Methods 1

Method 1a

Multidirectional insertion of implants, where implants are inserted (wherever possible) at an angle to each other. To allow the insertion of prosthetics the following steps are then performed:

- The abutment heads (Fig. 1 2) are parallelized by **bending the shafts of the implants** (Figs. 3, 4, 7, 9, 11, 16b) to accommodate the prosthetic restoration. Or:
- Angulation adapters (as intermediate elements) are cemented. Or:
- By grinding the big abutment heads.
- Prosthetic constructions and implants are connected by prosthetic screws (for Multiunit design of Corticobasal[®] implants, Fig. 1 - 2)

Method 1b

Stability is achieved through:

Mandatory placement of implants in cortical engagement at least in the strategic

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positions. Placement of additional supporting implants for stabilization.

• Full penetration and anchorage in the 2nd or 3rd corticalⁱⁱⁱ (i.e., not just support by the cortical) of the force-transmitting threads in the cortical is (in most areas of the jaw bones) mandatory. As a result both extrusive and intrusive forces are transmitted into the cortical bone.

Method 1c

Anchoring the implants in the second and possibly third cortical bone layer, independently of the alveolar bone. Cortical areas that are resistant to resorption are preferred.

Method 1d

Placement of Corticobasal[®] implants in cases with severe and active periodontal involvement. Under protection of strong topical disinfection agents the teeth and subsequently the periodontally involved soft tissues are removed. Corticobasal[®] implants are placed instantly and they are then splinted by a rigid construction^{iv}.

Method 1e

Spongious, alveolar bone areas are avoided for anchorage. Achieving "osseo-integration" is not the primary aim of the treatment with the Corticobasal® implant. Corticobasal® implants are osseofixated in corticals and then splinted by a rigid construction.

Method 1f

Fixation of polished implant bodies made from implantable material with the aim of achieving mechanical anchorage in cortical bone areas of the maxillo-facial skeleton. Subsequent splinting by the prosthetic construction in an immediate loading protocol.

Method 1g

Creating anti-rotation features for an implant by bending intra-osseous parts of the shaft of the implant.

Method 1h

Achieving primary stability by vertical condensation of the spongious bone by wide **body** BCS. Wide body = big volume of implant material at the thread.

SITE-SPECIFIC METHODS

Method 2

Placement of implants between the mental nerves (in edentulous mandibles) with or without utilization of the caudal cortex of the mandible. The threads of the implants



are inserted in the direction of the chin, which prevents damage to the mental nerve. Typically, two implants are used on each side of the mandible (Fig. 2). Only if the bone of the anterior mandible exhibits insufficient mineralization the caudal cortex can be used for anterior anchoring.

Method 3

Anterior anchorage of segmented bridges with insertion of one or two long Strategic Implant[®] in the gap between the root of the canine and the mental foramen, Fig. 3. The threads of the implant extend below the root of the canine. The implant will extend to, and can be anchored in, the caudal cortical bone of the mandible to the extent necessary to achieve stability.

Methods 4

Method 4a

Nerve bypass: Endosseous positioning of the Corticobasal[®] implant inside the distal (proximal) mandible, by bypassing the inferior alveolar nerve on the lingual or vestibular side, if necessary/possible by anchorage in the caudal cortical bone, Fig. 4, but without penetrating with the apex of the implant through the cortical.

Method 4b

Nerve bypass: Endosseous positioning of the Corticobasal[®] implant inside the distal (proximal) mandible, by bypassing the inferior alveolar nerve on the lingual or vestibular side, if necessary/possible by anchorage in the caudal cortical bone, Fig. 4, with penetration of the apex of the implant through the cortical.

Methods 5

Method 5a

Lingual cortical anchorage in the distal mandible: Implant placement with anchoring the load transmitting threads in the lingual bone undercut, below the mylohyoid ridge (where applicable, Figs. 5a - 1, 5a - 2) with the aim to achieve truly penetrating anchorage. The apical thread of the implant must be fully anchored in the lingual cortical and it may partly over-project this cortical into the floor of the mouth. The inferior alveolar nerve will run caudally to the implant body. As a rule, two or more such implants are placed distally to the mental nerve (i.e. in the proximal, horizontal part of the mandible). Typically the inclination of the heads of these implants (before bending) is towards the anterior implants.

Method 5b

Vestibular cortical anchorage in the distal mandible: Implant placement with anchorage in the vestibular cortical bone and crestal to the inferior alveolar nerve, Fig. 5b.



Method 5c

Vestibular cortical engagement in the distal mandible, with the implant running below the mandibular nerve: This method is used if the inf. alveolar nerve is located crestally, and if the distal mandible is wide and high enough to allow this type of placement.

Method 6

Placement of a Strategic Implant[®] with the aim of a palatal/lingual and vestibular support reaching into the cortex without utilizing the second cortical bone layer in a vertical direction, Fig. 6-1. Main areas of application:

- Extraction sockets of mandibular and maxillary premolars.
- Lower and upper anteriors, Fig. 6 2.
- Tuberosity of the maxilla.

Methods 7

Method 7a

Penetrating anchorage of implants in the bony nasal floor. The implant is inserted through the maxillary alveolar bone. This technique can include the penetration of the mucosa of the nasal floor, with the result that the polished implant tip and eventually also a part of the thread can extend slightly into the lower airway, Figs. 7a - 1 and 7a - 2.

Method 7b

Implant placement on the **palatal side of the severely horizontally atrophied alveolar bone** (knife-edge maxilla) without penetrating the alveolar bone and directly into the nasal floor, Fig. 7b - 1. Method 7b is a special form of application of Method 7a, Fig. 7a and b.

Methods 8

Method 8a

Use of the cortical floor of the maxillary sinus for penetrating implant anchorage, Fig. 8a.

Method 8b

Utilization of an intra-sinusal septum for multi-cortical anchorage of a Strategic Implant[®], incl. the penetration of parts of the implant's thread into the maxillary sinus, the Fig. 8b.



Method 9a

Bypassing the upper canine root: Anchoring an implant in the cortical floor of the nose, with the abutment head positioned in the region of the first or second premolar and the shaft of the implant bypassing the root of the canine on the palatal side, Fig. 9. Method 9 is a special case of Method 7a or 7b.

Method 9b

Bypassing the upper canine root: Anchoring an implant in the median raphe of the maxilla, with the abutment head positioned in the region of the first or second premolar and the shaft of the implant bypassing the root of the canine on the palatal side.

Methods 10

Method 10a

Placement of the apical thread of the implants into the cortical bone of the pterygoid plate of the sphenoid bone: Placement can be performed either directly into the pterygoid plate of the sphenoid bone or through the maxillary tuberosity and/or through the maxillary sinus^v.

In an optimum end position the apex of the implant penetrates into the internal pterygoid muscle (between the wings of the pterygoid process), because this tends to increase the anchorage in the pterygoid plate through compression. For this method Corticobasal[®] implants or designs which include compression threads are applied.

Method 10b

Double tubero-pterygoid: Two parallel or slightly diverging implants are placed into the fusion zone between the distal maxilla and the sphenoid bone, Fig. 10.

Methods 11

Method 11a

Anchorage in the **bone** on the palatal side of the maxillary sinus, without anchorage in the nasal floor or in the median raphe of the maxilla, Fig. 11.

Method 11b

Anchoring of the implant from lateral in the median raphe of the maxilla.



Method 12

Anchorage of the implant in the body of the zygomatic bone, Fig. 12:

- Using a trans-sinusal procedure^{vi}. Or:
- Inserting from caudal, directly into the body of the zygomatic bone.

Method 13

Placement of implants vestibular to the knife-edge ridge in the anterior mandible. Typical implant diameter is 2.7 mmd or 3.0 mmd. Anchorage in the base of the mandible, Fig. 13. Vertical implant parts run partially subperiosteal. The anterior caudal cortex can be also used for such type of implant anchoring, however care must be taken not to damage close by blood vessels and a strategy for long term preservation of the oral mucosa to cover the vertical implant struts must be applied.

Method 14

Anchoring an implant in the **fresh extraction socket of the first or second premolar** with at least mesial and distal cortical anchorage in the bone of the extraction socket, Fig. 14. Utilizing the medial cortical of the mandible increases the anchorage.

Method 15

Inserting a larger-diameter implant into the fresh extraction socket of the **palatal root** of the upper first or second molar, Fig. 15.

Methods 16

Method 16a

Inserting two implants in the region of the upper first premolar, with one implant being placed palatally into the floor of the nasal cavity (Canine root bypass, Method 9), while the other implant is anchored in the region of the vestibular root of the first premolar. Fig. 16a.

Method 16b

Inserting two or three Corticobasal[®] implants in the region of the upper 1st or 2nd molar as an alternative to anchorage in the tubero-pterygoid region, in the event that Method 10 is not feasible, Fig. 16b.



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