

## 1<sup>st</sup> IF® Guideline for Corticobasal® Practitioners

Issued: December 2024, version 3

by the

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## Timeline for Grinding Adjustments and Clarifications on “Pain” Which the Patient May Report

There are different reasons for grinding of the new teeth after the cementation of the bridges:

- Right after placement of the bridges, we adjust the occlusal situation and masticatory function.
- After one meal (at least), better on the next day, this is repeated and many more not-ideal contacts and slopes will be adjusted.

We have to consider, on the other hand, that the surgery results in trauma to the temporomandibular joints. We must expect inflammation (non-bacterial) and swelling in the joints. It takes up to 15 days after surgery until this heals. The swelling leads to a lowering of the distal mandible. It makes no sense to adjust the occlusion fully before the 15<sup>th</sup> day after surgery and treatment.

The same happens also to patients with teeth after trauma or if the mandible is unintentionally or intentionally held in an eccentric position and if at the same time muscle forces (M. masseter) are applied. Patients who come for treatment with sole contacts in the frontal groups of teeth left are typical examples of patients with such an eccentric position.

Long and wide mouth opening during surgeries and prosthetic treatments can also be considered as such a trauma, which leads to swellings in the TMJ. Reports of similar traumatic events have been published after wisdom tooth removal and even after long lasting prosthetic interventions (on teeth or implants).

The swellings and other temporary damages can reach an amount when even the discs are displaced and this may even block mouth opening. This condition, which is often associated with severe pain during all movements, must be differentiated from infection (abscess) of maxillary and / or mandibular spaces. This differentiation can be especially challenging, if large amounts of infected tissue are removed during the implant surgery and if large flaps are made. This can lead to false-positive results in a screened blood sample. The repositioning of the displaced disk can be carried out manually, e.g. under local anesthesia.

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If used, the local anesthetic is administered via high bilateral tuber anesthesia that enables at least 30 minutes time for pain-free movements

During this pain-free period, mouth opening can be practiced by the patient. This therapy could be repeated two to three times per day in the following period until pain-free opening of the mouth is enabled. In this situation, a self-repositioning of the disc may occur.

Keep in mind that not only does the surgery last long and is traumatic (especially if many teeth have to be extracted). Also, all subsequent prosthetic treatments (during the next three to four days) are adding up to the traumatic situation of the TMJ.

Prophylactic antibiotic therapy should be administered in any case for several days until the situation improves significantly.

Due to the swelling in the joint(s), which is often observed to be asymmetrical, the occlusal situation cannot be adjusted fully unless the patient does not stay close to the treating clinic for 15 days. Although bilateral equal contacts have been installed during the final grinding, we often see one-sided contacts during the three-month control.

After 15 days, when the (non-bacterial) inflammation has faded away, the occlusal situation has changed quite often: unilateral first contacts appear and those should be removed during the three-month-control. In order to have enough vertical available or grinding, the bite is left slightly open at the end of the initial treatment.

Painful and limited mouth opening could also appear due to intra-operative trauma caused by various factors, such as one-time or repeated administration of local anesthetics into pterygomandibular space, intra-muscular swelling or hematoma, as well as needle-related physical trauma of the muscle and flap-related soft-tissue or periosteum trauma.

All of the aforementioned can occur even more often if the surgical procedure is prolonged and / or complicated by different factors, such as procedure-related (difficult third molar extractions, cyst extirpations, buccal / lingual implant anchorage, etc.), various intra-operative complications like bleedings, limited visibility due to anatomical reasons, uncooperative or unprepared patient.

However, if the diagnosis of an infection is established properly and timely after careful patient examination and laboratory blood tests, surgical, antibiotic and supportive therapy must be considered.

Experience shows that chances to create a retro-maxillary abscess during placement of a pterygoid implants are close to zero. If such a tuberopterygoid implant should be replaced later due to mobility, a specific protocol must be followed however in order to avoid the development of an abscess:

- If the old tuberopterygoid screw is removed a few days before the new implant is placed, the mucosa in that area has enough time to close. After this short waiting time, the new implant is placed into a sterile environment and infection does not occur.
- If the removal of the tuberopterygoid implant is done in the same intervention, the new implant cannot be placed in the same slot. Hence, a new (typically parallel) slot is prepared which is not in contact with the old slot.

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**Due to the described events and the swelling in the joint, we can observe that the distal mandible (i.e. the ramus) sinks (shifts caudally). If we install(ed) contacts on the first molar, we would soon notice that these contacts result in “early contacts”. This may lead to overloading of the distal implants, mainly in the distal mandible.**

In segment cases, the first control should be done earlier, e.g. after four to six weeks.

For all aforementioned reasons, no real contacts should be made on upper first molars (6). There, we install “almost-contacts”, which we create by using 600- $\mu$ m occlusal paper, making sure that no occlusal contacts nor masticatory slopes are visible on the upper 6. Contacts will be arranged only on the eight premolars.

Grinding away the real contact will be done rather on the upper 6 because this will lead to a more pronounced curve of Spee.

## **Can a Corticobasal® Implant Be the Origin of Pain Right After the Initial Intervention?**

It was never reported that polished, cortically anchored implant bodies that are splinted by the bridge will lead to pain. As the bone is not equipped with sensitive nerves, no pain can be expected from this origin. Although some patients (wrongly) localize the pain to the implants, this cause of pain is not possible so early after the treatment.

Likewise, the Schneiderian Membrane is not equipped with sensitive nerves, so this means that pain cannot stem from the maxillary sinus. In this aspect, the Schneiderian membrane differs from the periosteum. In cases of putrid infections inside the maxillary sinus, pain can be transmitted from nerves that are affected by the pressure building up inside the maxillary sinus. The typical localization of that pain is the infraorbital nerve and it is exactly the pain there that points to this diagnosis.

Hence, it is clear that (unless the inferior alveolar nerve is injured by an implant) **there is never an indication for implant removal due to post-operative pain**. The “post-operative phase” is considered to last up to three months. Bruxists may however overload the peri-implant bone by overly strong forces what may lead to an overload osteolysis. In this case, a patient will be complaining of a clearly **localized** “pain during chewing”. This condition is treated by occlusal adjustments and sometimes by injection of Botulinum toxin into the masseter muscle, intra- as well as extra-orally. Additional injections into the temporal muscle are another possible option of treatment.

Intra-oral pain may stem from the soft tissues being close to the implants or far away from them.

Patients with low pain levels may experience disseminated pain in the gums after eating (impacted particles of food are disturbing both the healing and the patient). This pain can last up to a maximum of three weeks. As a therapy, regular rinsing with strong disinfectant will help to shorten the period of healing and thereby the patient’s adaptation to the new situation. Note that many patients will be unable to localize the origin of pain and are unable to describe details of the pain as well.

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The aforementioned events during the initial treatment can lead to mild but unpleasant pain. The origin of the pain can be:

- In approximately 90% of the cases that show pain, the pain stems from the anterior (oblique) portion of the masseter muscle, the temporal muscle or other peri-oral muscles. This pain will be reduced and eliminated by self-massage done by the patient. The pain should disappear within two weeks. If it does not disappear, professional massage is recommended. Often patients underestimate the fact that the massage must be done several times per day. Some patients neglect this massage, because it causes pain by itself, as long as the muscle shows a hard span and myogelosis. Pain that originates from the masseter muscle will typically not be localized by the patient. This pain seems to wander around (actually it is projected by the brain to different locations) and can appear in the upper and lower jaw.
- Small cement leftovers: A search for excess cement and its removal are a must if patients report post-treatment "pain".
- Traumatic lesions of the joint (as described above) can lead to pain. They usually disappear by themselves in two to four weeks.
- In case of a non-balanced occlusion, early contacts may present repeated trauma to the joints. In this case, the condition lasts until the origin of the problem is treated.

Based on clinical observations and considering available literature, we can clearly define a post-treatment TMD phase (with or without clinical manifestations of problems) which could last up to 21 to 24 days.

In addition, it is important to note that both jaws are usually not equally affected. During that phase, occlusal adjustments have to be done with caution and the final post-operative occlusal equilibration has to be performed no earlier than four weeks after. As this adjustment is an intervention as well, the masticatory system will react to it: This may lead to a necessity for more adjustments. Hence, it may take two to four years until full stability in the masticatory system (including the bone) is achieved. One or more controls during the first three months are recommended and after this, more adjustments are carried out during the annual controls.

Keep in mind that more controls are required in cases where teeth are still present in the mouth because teeth will change their spatial position namely by elongating, intruding and tilting.

The time-period for the bone's adaptation and consolidation has been defined to be two years (24 months). Hence, there is a difference between these events and the time until "osseointegration" happens (three to six months). Conventional implantologists tend to forget about this 24-month period, which applies to all bone(s), regardless of the type of implants being placed, whether they were osseointegrating or osseofixed.

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## Conclusion

1. Due to the inborne invasiveness of the procedures, especially full jaw / mouth implant reconstructions and the subsequent prosthetic phase, pain may be reported. Typically, the patient cannot localize this pain.
2. In approximately 90% of the cases, the origin of the pain is the masseter muscle, the temporal muscle or other peri-oral muscles. The other causes are traumatized soft tissues and impacted food particles.
3. **The implants themselves are, at least three months after placement, never the origin of early post-operative pain.**
4. Implants which project into the maxillary sinus do not cause pain either, as neither the bone nor the Schneiderian membrane are equipped with sensitive nerves.
5. Pain originating from cortically anchored implants may appear after three to six months and is typically a result of an overload osteolysis. This osteolysis leads to implant mobility. Implant parts that are in contact with the periosteum on the “other side of the second cortical” will irritate the periosteum and cause pain. This mechanism must be considered to have an important safety aspect because it warns patients early if overload happens and brings them back into the implantologist’s office, where the event can be treated quickly and successfully.

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