



# *implant-supported restoration with craniomandibular dysfunction*

Solutions with Frialit

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## **INTRODUCTION**

Craniomandibular dysfunction (CMD) is the general term for a heterogeneous group of diseases. Therapy requires detailed planning of the prosthetic reconstruction, with attention to the cranosacral mechanisms and dorsal support. The following general guidelines are used as an indication for implant-supported restoration for CMD patients: Replacement of missing support zones, avoid large bridges to prevent molar intrusion under loading, avoid splinting of the palatal suture by constructions extending over the center line. Two case studies are used to illustrate these guidelines.

## **CASE REPORTS**

### **1. Free-end edentulism**

A 59-year-old patient had been suffering pain in her left arm for about one year. The orthopedist had administered depot injections in the left shoulder with no results. Physiotherapy also did not help and the patient had stopped the treatment. She complained about recurring blockades of the cervical

spine. The orthopedist referred the patient for dental examination and possible therapy with a diagnosis of suspected CMD. The oral diagnostic results (Fig. 1 and 2) were as follows: Bridge in the third quadrant with monoreductor, which had been renewed two years previously, still not accustomed to the new occlusal situation. A manual structural analysis was conducted first to record the patient's craniomandibular situation. The following anomalies were found: Compulsive bite with a negative effect on the full-body structure, cranial joint compression on the right and left, disruption of adapted equilibrium by the latest restoration in the mandible. At the time of examination the patient did not have stable support in the molar region. The monoreductor on the left side of the mandible could not adequately transfer the chewing forces to the alveolar ridge because of its position on the mucosa. The chewing forces, the resilience of the mucosa and the resulting subsidence under functional and particularly parafunctional loading had resulted in compression of

the left temporomandibular joint. The right temporomandibular joint was also compressed under loading. The cause was the movement of the molars because of the periodontal problems.

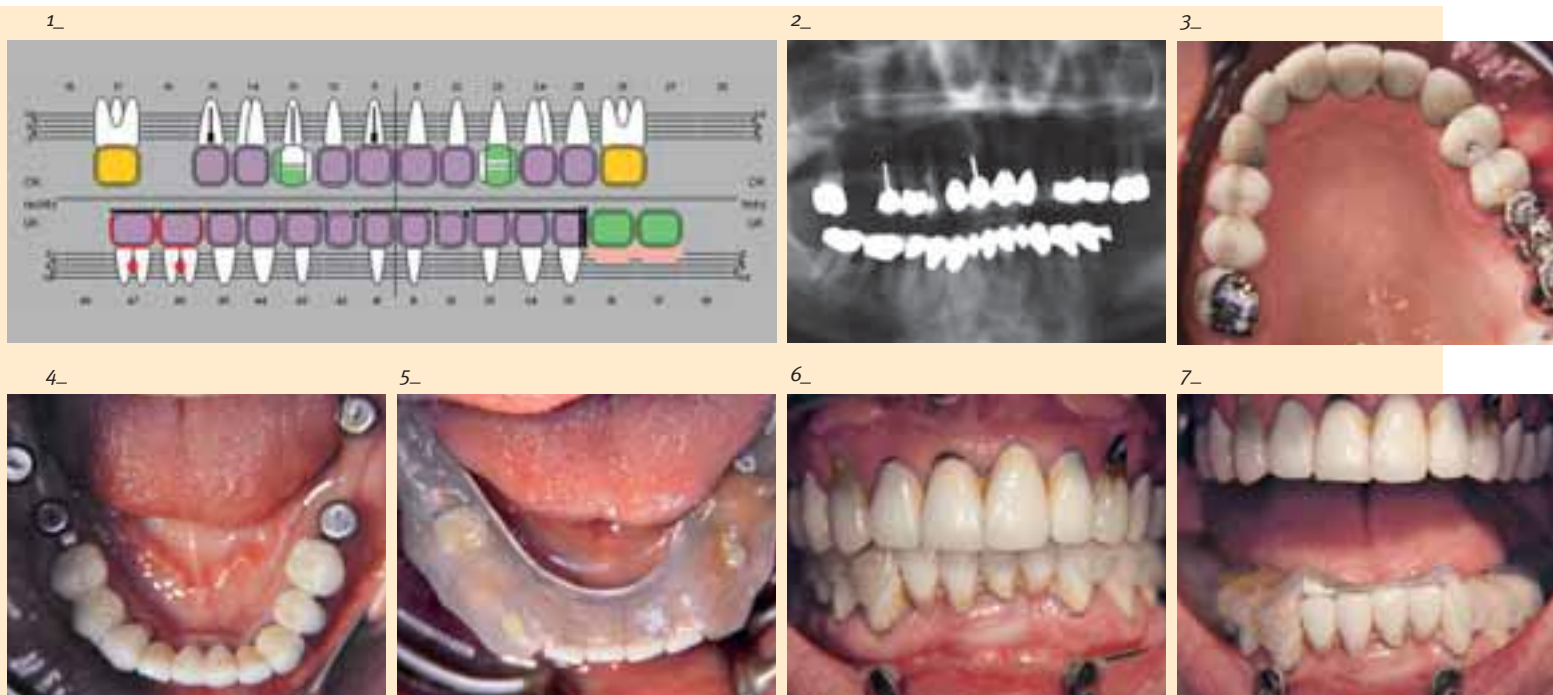
The initial therapy was therefore required to concentrate on stable support in the molar region. For the above-listed reasons the only way to achieve support adequate for the CMD was by implant placement on each side. It was necessary to extract teeth 46 and 47 first.

The Frialit implants were uncovered three months after placement (Fig. 4) and a CMD splint was placed directly on the gingiva formers (Fig. 5 to 9). The resulting stable support of the splint was used for decompression of the two temporomandibular joints. The tissues of the patient's stomatognathic system were relaxed and mobilized with the aid of craniosacral osteopathy and manual physiotherapy techniques.

Physiotherapy was followed by sessions for grinding the splint to stabilize the intermediate result of the central position of the mandible. This therapy covered a total of 20 sessions of 40 minutes each over a period of seven months. Then, six months without any therapy followed. In this period the patient wore the CMD splint permanently and without any additional corrections. This is necessary while waiting for permanent stability of the treatment results. Because this was the case, the occlusal position achieved with the aid of the splint could be stabilized by a definitive prosthetic restoration (Fig. 10). The restoration used crowns and bridges (Fig. 11 to 13).

**2. Prevention of intrusion of molars**

The same patient presented three years after delivery of the denture with an acute exacerbation of the chronic apical periodontitis in tooth 15. During the first occlusal rehabilitation



1\_Initial diagnosis: violet – veneered ceramic crown/bridge; green – composite; yellow – metal crown; red – caries  
 2\_The OPG of the initial situation  
 3\_The clinical situation at the start of treatment  
 4, 5, 6, 7\_The implant-supported splint

it had been decided not to conduct a revision of the root filling because it was pain-free. The tooth was extracted and replaced by a Frialit implant. Because the anterior abutment tooth was now missing, the bridge (Fig. 10) also had to be removed. The already missing tooth 16 was also replaced by an implant. The remaining tooth 17 would probably not have been able to withstand the massive occlusal loading without intrusion during the implant healing period, even with a gingivally positioned provisional restoration. Three temporary implants were also placed to prevent the danger of intrusion (Fig. 14). They supported the two splinted temporary crowns (Fig. 15). This relieved tooth 17 of the load and prevented an intrusion, and therefore prevented a renewed, unilateral compression of the temporomandibular joint.

The general view is that the removal (decementing) of terminal crowns of a large bridge in the molar region (particularly in the mandible) is the sole cause of bone torsion. The author however holds the view that at least a second fact is relevant,

i.e. the intrusion of the terminal abutment tooth as a result of loading. This may well be the deciding factor. The danger of intrusion can be eliminated, particularly with CMD patients, by the insertion of Frialit implants. The author's view is supported by the regular observation that a migration of the attachment is observed with slide attachments in large bridge constructions. This effect is caused by subsidence of the terminal molar (intrusion) simultaneously with a slight loosening of the mesial bridge anchor. The danger of intrusion occurs particularly as a result of incongruence between the available upright root surface and the force that is transferred to the bone after the loss of teeth in the support area.

### 3. No splinting of the palatal suture

A life-long moveability of the cranial sutures has been postulated as part of the craniosacral rhythm. This means, for example, that during chewing the sutures of the relevant bone connections open and close. This can be observed with

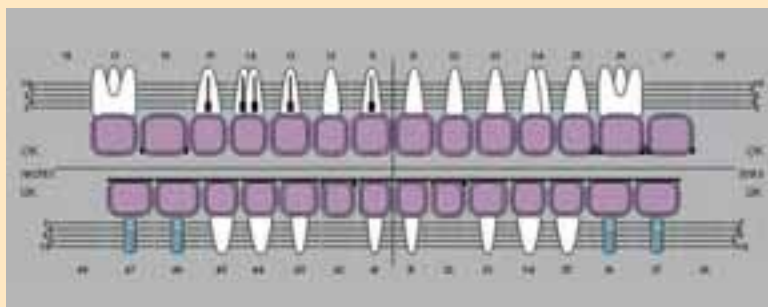
8\_



9\_



10\_



11\_



12\_



13\_



8\_ The habitual intercuspation

9\_ The occlusal position is centrally stabilized.

10\_ The diagnostic results after occlusal rehabilitation

11, 12, 13\_ The final restoration after stabilization of the occlusal position in static and dynamic occlusion

fixed dentures that span the center line in the maxilla. This is because the medial palatal suture is also subject to the above-mentioned motions.

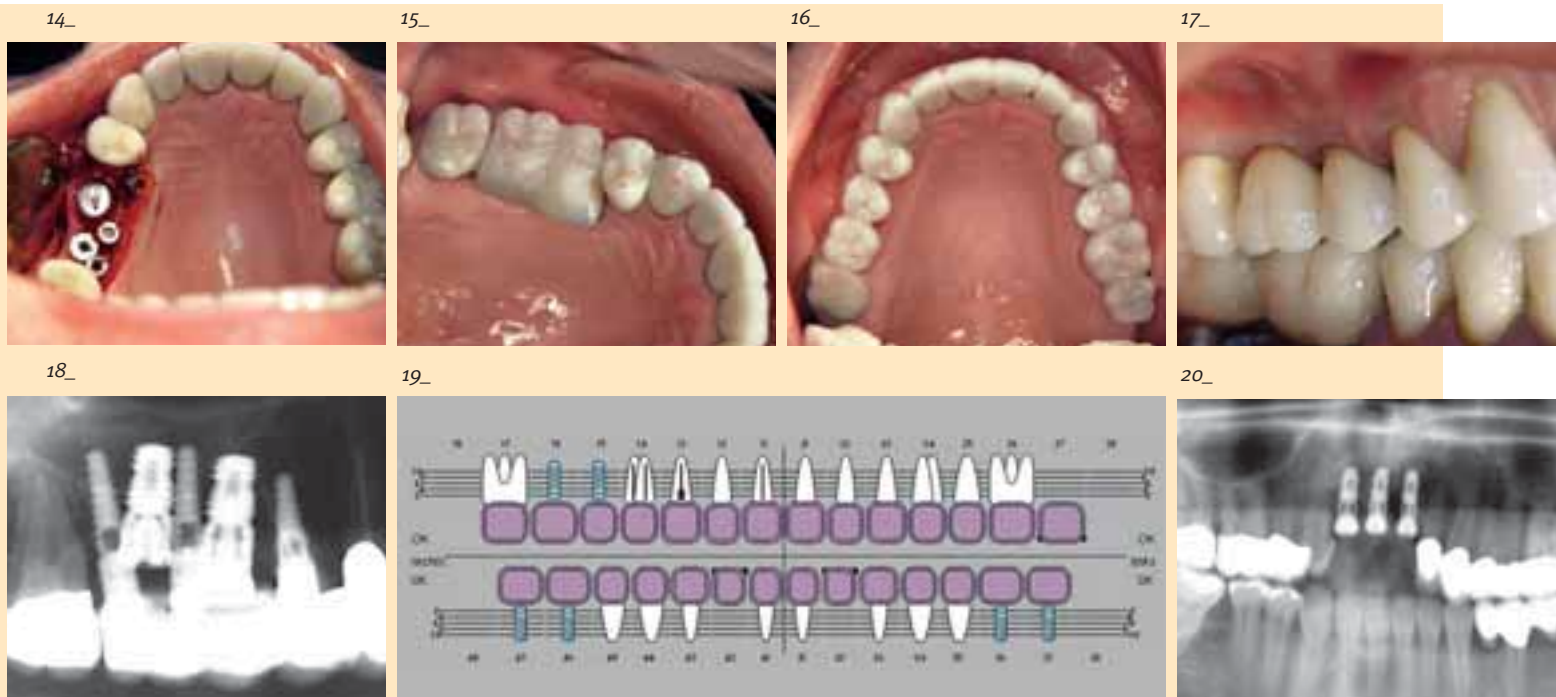
Patients occasionally report diffuse feelings of tension in anterior bridges spanning the center line after delivery. If this cannot be managed by grinding, splinting of the palatal suture must be considered. This blockade causes interference with the craniosacral rhythm. The removal of anterior bridges that are subject to tension generally results in spontaneous improvement. Another indication for this assumption is the fracture of crown blocks or bridges in the region of the center line that is occasionally observed.

The solution of this problem is to replace every missing tooth in the maxilla with an implant (Fig. 20). An implant-supported bridge would result in more rigid splinting of the palatal suture than a tooth-supported bridge. The lack of movement of the implants would make the splinting even more rigid in comparison to the inherent movement of the natural abut-

ments. The fact that many patients with anterior bridges in the maxilla do not feel any tension is an indication of the possibility of compensation. Single-tooth implants without splinting of the center line should be selected as the treatment no later than the initial appearance of the feelings of tension. The patient must be informed of the possible problems of an anterior maxillary bridge extending over the center line. ■



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14\_ The Frialit implants in positions 15 and 16. Temporary implants are placed to support the temporary denture during the healing period. They were placed in the palatal proximal region to preserve the implant site of the final implants.

15\_ Inserted temporary denture with colored occlusal contacts. The Shimstock foil must also be retained by the temporary.

16, 17\_ The new crowns

18\_ X-ray check after implant placement with two final and three temporary implants in region 15, 16

19\_ Diagnostic results after delivery of the final restoration

20\_ Single-tooth implant in the anterior maxillary region

case 2