The Foundation of Knowledge

Consensus Paper in Consultation

Planning for the immediate loading of dental implants

I. Terminology

The subdivision into immediate and delayed loaded implants is not a completely clear distinction, because an entirely unloaded healing of implants is not possible with a living human being. From the moment of insertion, load is placed on the implants at their boundary layers to the living organism, as intraosseous pressures and displacements of bone layers occur with every movement. By, immediate loading' we therefore mean the term as it is used prosthetically.

II. History and state of current development

In the field of orthopaedic surgery, the force-fit immediate loading of implants has been the most up-todate technology since the introduction of screws and plate osteosynthesis (c. 1980). In the treatment of fractures of limbs, not only are the screws for the fracture plates used at the same time, but the fracture plates themselves are also used. The patient's interest, well understood by the practitioner, and surgicalpracticeare in harmony here.
By contrast, in dental implantology - depending on the type of implant used - a delayed (two-stage) procedure is still practiced. Here, the argument for sterile submerged healing in order to prevent infection can only be applied to implant designs with a wide diameter at the implant neck and a simultaneously surface-enlarging structure under certain conditions (e.g. implant types such as Osseopore and Endpore). By now, various implant systems are available to implant specialists that allow for immediate loading or that have been specially developed for this treatment option.

III. Scientific substantiation of immediate loading

Sufficient general-scientific substantiation of prosthetic immediate loading of implants was demonstrated long ago[1] . This is especially true for those implant systems aimed specifically at a single-stage procedure and a prosthetic immediate loading due to their design and in accordance with the manufacturer's instructions. Other implant systems, which only offer this option under certain conditions (for example, because they require more interventions (including pre-implant ones) and longer time intervals during the pre-implant surgery) are to be judged with caution when planning an immediate loading.
There is no reliable, scientifically obtained evidence that certain peculiarities of the intra-osseous implant surface (etching, sandblasting) would favour or allow immediate loading. On the other hand, such modifications to the surface can favour the development or the maintenance of the so-called periimplantitis.

However, there are sufficient studies and a great amount of clinical experience in dental and orthopaedic surgery suggesting that macro-mechanically designed anchors in bone may be subject to

immediate loading.

IV. Planning for immediate loading in specific cases

Contemporary implant-prosthetic treatment planning demands at the very least that the patient be presented with the option of a prosthetic immediate loading. The decision for this treatment option in any particular treatment case is subject to the decision prerogative of the practitioner in consultation with the fully informed patient.

1.) Findings and the patient‘s desire determine the choice of implant system

However, it is the judgement of this consensus that the list of individual indications for prosthetic immediate loading according to treatment classes and, based on this, a generalized recommendation regarding the number of required implants do not sufficiently address the individual care needs of the patient[2]. Instead, the practitioner‘s intentions regarding implant type are of increased importance, meaning that, given the abundance of available implant systems, the rejection of a prosthetic immediate restoration should only be made in exceptional cases.

In particular, cortically-supported implant systems (bicortical screws, BCS), basal implants (e.g. BOI, disk implant) and implant systems which, by using bone compression along the vertical implant axis lead to a corticalisation of the canellous bone section – often with dramatic improvements to the usable bone quality – (e.g. KOS, Bauer screw) generally take precedence over large, bullet shaped 2-stage systems these days, since the latter require and displace substantial amounts of preoperatively existing bone. It must also be mentioned that an estimated 95% of the bone augmentation measures performed for the purpose of implant anchoring would be unnecessary, if only the above-described implant systems using existing bone were used from the outset. The prevention of pre-implant bone augmentation measures as a planning objective is also often in accordance with the patient‘s wishes. The selection of the intended implant type (design in combination with surface texture, length, diameter) must follow from the findings made and the therapy goal formulated by the patient.

A decision in favour of a one-piece system may have advantages because of the avoidance of a microgap in terms of osseointegration, especially since it does not make sense to install fittings and other vulnerable junctions that could be colonised by germs when the implant is already to be loaded immediately. The use of compression screws can help achieve primary stability. Basally inserted implants may favour immediate loading because, due to their cortical support, they are not dependent on vertical bone to the same extent as classical screw implants are. Bicortical screws/BCS therefore occupy an intermediate position between screw implants and (lateral) basal implants, because, on the one hand, they are basally supported and, on the other, they are introduced in the same way a screw is. Unlike compression screws, they do not compress bones laterally and they exhibit no surface enlargement. Despite differences in functioning, these types of implants are suitable for immediate loading given certain indications.

2.) Findings and implant system determine the individual treatment plan

Firstly, the planning of the implant-prosthetic treatment must be based on the findings of the patient's situation – in particular, the strategic positioning possibilities of the implants, objectives that are sensible from a prosthetic perspective, and the capacity of the existing bone structures. Secondly, the implantologist is guided in the individual treatment planning by the specific advantages of the implant type he has selected on the basis of these findings. A treatment planning based on generalised parameters for the number of implants, depending on the treatment class, that would apply to all implant systems alike, would not really be considered a findings-based treatment planning.

The individual treatment situation, the planning viability and patient's desire for a prosthetic immediate restoration regularly give the doctor a sufficient safeguard against the treatment option of using immediate loading, unless - as an exception - one of the following contraindications were to be present:

insufficient bone quantity or quality with respect to all types of implants available on the market no or only insufficient splinting or stabilisation options (e.g. secondary screw connections), especially in the front teeth and single-tooth gaps
Circumstances apparent from patient's medical history and poor patient compliance Restriction of the indication range as per the manufacturer's instructions for the respective implant system.

As part of the individual risk disclosure, it should be pointed out to the patient that the immediate loading has been developed and scientifically proven using the edentulous mandible and that individual risks must be gauged higher, the smaller the gaps to be treated. In treating single-tooth gaps and partially edentulous jaws, the patient should be advised that, instead of an implant-borne prosthesis, the conventional bridge is still an option, as a fixed restoration variant, provided a sufficient number of viable pillars are present [3].

3.) Disclosure of other control mechanisms

If the implantologist opposes an immediate loading either on principle or in the patient's specific case, he may inform the patient that the related issues have been debated heatedly in the past, and he is taking an individual stance.

If, by his decision for a particular implant system or pre-implant measures he has limited the available spectrum of therapies, regardless of the patient's finding and desires, he must disclose this to the patient.

If the implantologist is aware that individual private health insurers will deny their liability for immediately loaded, implant-supported dentures in certain situations by citing the lack of long-term studies, he should inform the patient of this. However, such refusals of compensation are not allowed with regard to those implant systems that the manufacturer has expressly issued for use under immediate loading[4]. The commercialisation of implant systems and the determination of the scope of application is not dependent on the presence of such long-term studies anyway, but only on an examination by an expert body commissioned by the manufacturer [5].

[1] on the medical necessity in the sense of § 1 para 2 GOZ, LG Tübingen, decision from 11/05/2005, 3 O 267/03; on the medical necessity in the sense of § 1 para 2 MB/KK of health insurance, LG Cologne, decision from 07/02/2007, 23 O 458/04).

[2] as yet no differentiation by implant systems: consensus paper by BDIZ from 26/02/2006 „Immediate restoration and immediate loading on implants“

[3] OLG Brandenburg, decision from 29/05/2008, 12 U 241/07

[4] on the medical necessity in the sense of § 1 para 2 GOZ, LG Tübingen, decision from 11/05/2005, 3 O 267/03; on the medical necessity in the sense of § 1 para 2 MB/KK of health insurance, LG Cologne, decision from 07/02/2007, 23 O 458/04).

[5] § 6 para 1 Medical Devices Act last modified by law from 14/06/07 (BGBl. I S. 1066); EU-RL 93/42/EWG (ABl. EG No. L 169/1 from 12/07/1993)