

Biological dentistry and ceramic implants

Full-mouth rehabilitation

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A 32-year-old patient took to social media to find out about biological dentistry and ceramic implants. Having long suffered from chronic complaints, she was looking for a new treatment option. Her medical history revealed the following problems: chronic Lyme disease, hemopyrrolactamuria, enlarged liver and spleen, numerous swollen lymph nodes on the neck, urination and major digestive problems, as well as several food intolerances. Her alternative health practitioner (a naturopathic doctor) established a connection to the oral cavity using a kinesiological muscle test (Autonomic Response Testing, developed by Dr Dietrich Klinghardt). The following case study focuses on biological dentistry as an alternative and promising therapeutic option.

Medical history and findings

During the initial dental examination, a conservative and prosthetically insufficient adult dentition was shown (Figs. 1–6b). In the functional analysis, the bite had dropped sharply, which was reflected in muscular imbalances of the head and neck muscles and dysfunctional temporomandibular joints. All the third molars, as well as teeth #17 and 26, had already been extracted. The bridge on teeth #25–27 needed restoration, and all the poste-

rior teeth had abraded composite fillings. Teeth #14, 12, 11, 22, 37, 36 and 46 had gradually undergone amalgam removal, owing to recurrent pain and hypersensitivity, though to no avail. The patient complained of apical pressure and pain in the areas of teeth #12, 11 and 22. Teeth #36, 35 and 46 were bite-sensitive, and the gingiva was swollen and painful and bled easily upon probing. On CBCT imaging, inadequate root fillings with apical osteitis in teeth #14, 22, 36 and 46 were observed. Osteolytic bone (ischaemic bone disease) was also seen in the areas that had contained the third molars, which had been removed without systemic preparation. Since the patient had previously dealt with the issue of neuromodulatory triggers and the associated disruptive autonomic regulation and stress symptoms, only a maximal biological remediation of the oral cavity was considered for her.

Biological dentistry

On these issues, it is necessary to look beyond the scope of the conventional dentistry doctrine. This is mainly based on the dental craft and still rarely considers medical basics regarding immunology, toxicology and the autonomic nervous system. Root canal therapy, for example, is initially a pure pain treatment. The tooth is merely considered a chewing organ, and the connection to the whole body is not in the foreground. Chronic inflammation throughout the body can lead to a number of problems through the chronic activation of the hypothalamic–pituitary–adrenal axis, the stress axis. The activation of the stress axis, also known as fight or flight syndrome, serves to provide energy in the short term, for example to run away from danger. Everyone is familiar with the feeling ahead of an examination: the mouth dries up, the pupils widen, the heart beats faster, the blood is moved out of the organs into the muscles and the ability to concentrate decreases. Adrenaline is pumped through the veins. One would rather run away than take the examination. In the acute case, this is not a problem, as all processes are regulated in a relatively quick manner once the danger has been averted. In the animal world, one can observe this very well: a lion attacks a zebra herd, and as soon as an animal has been lacerated, the herd

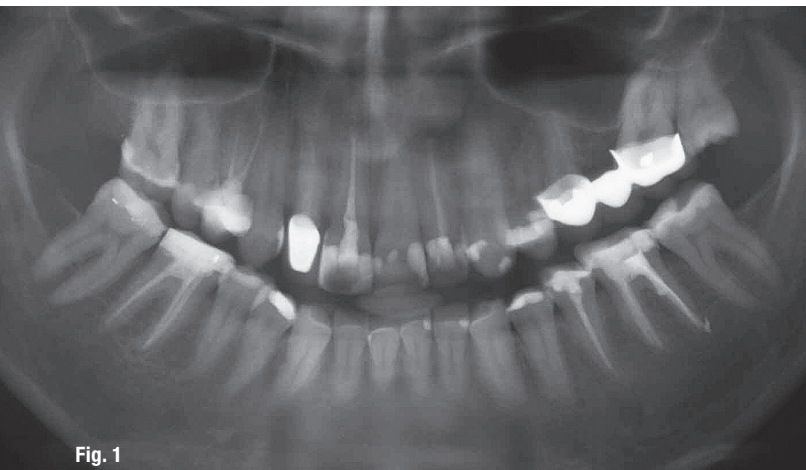


Fig. 1

Fig. 1: Initial pre-op radiograph.



Fig. 2: Pre-op frontal view of the maxilla. **Figs. 3 & 4:** Views of the initial clinical situation. **Figs. 5–6b:** Lateral views of the initial clinical situation. **Figs. 7–9:** Occlusal views post-op. **Fig. 10:** View of the maxillary arch showing the implants in regions #11, 12 and 22. **Figs. 11 & 12:** Lateral views of the long-term provisional prostheses.

becomes relaxed again. But what if the stress axis is chronically activated? Any stressors, whether triggered by chronic inflammation in the body, food intolerances, or stress at work, lead to the activation of the adrenal gland. These small glands found above our kidneys react by increasing the formation of cortisol, epinephrine and norepinephrine. Cortisol, the stress hormone, is a catabolic hormone that has an immunosuppressant effect. The raw material is cholesterol, from which all sex hormones are produced. If too much cortisol is produced in the long term, this results in what is referred to as “pregnenolone steal” in functional medicine, since the raw material is in this case being used for the production of cortisol instead of sex hormones.

As a result, long-term activation of the stress axis often results in a burn-out syndrome: the adrenal glands become burned out and can no longer produce cortisol, epinephrine and norepinephrine. The patient becomes chronically tired and his or her libido drops. Other symptoms of prolonged stress by cortisol overproduction on the whole organism include chronic inflammation of the gastrointestinal tract with ulceration and leaky gut syndrome; general excitability, anxiety or even depression; sleep disorders and neuromuscular complaints, such as increased bruxism; difficulty in concentrating; fatigue of

unclear cause; excessive sweating; a general immune deficiency with frequent infections due to chronic fatigue of the adrenal glands (burn-out); and autoimmune and thyroid diseases. It is also called sympathetic tone. Chronic stress is the main challenge in today’s epidemic of chronic diseases. The sympathetic nervous system becomes overloaded, and the parasympathetic part is blocked. However, our regeneration is significantly dependent on the activation of the parasympathetic nervous system. This supplies all abdominal organs and is responsible for the excretion, relaxation and detoxification functions. The trigeminal nerve also carries parasympathetic fibres. It is overstimulated by chronic inflammatory processes in the jawbone. Each nerve is capable of transporting any toxin, microorganism or immunocytokine into the brain stem or basal ganglia via retrograde axonal transport. This mechanism was already described by A.D. Speransky in the 1930s and by Stoertebecker in the 1970s. The latter experimented with mercury in the oral cavity and was able to show axonal transport to the trigeminal ganglia and other head ganglia within 24 hours after exposure. The aim, as in the present case, is to find and eliminate the cause of the chronic stress. In biological dentistry, the consistent rehabilitation of all oral interference (neuromodulatory triggers) is referred to as the “all-in-one” concept.

Planning and therapy

Protective measures included the removal of the metal-based ceramic bridge on teeth #25–27, the surgical removal of the osteonecrotic areas of the jaw that had previously contained the third molars (regions #18, 28, 38 and 48) and immediate implantation with ceramic implants (Short Cut Concept, developed by Dr Karl Ulrich Volz) in the areas of the previously root canal therapy-treated teeth (teeth #14, 12, 11, 22, 36, 35 and 46), as well as intraoperative impression taking of the teeth and implants for the production of laboratory-produced long-term provisional protheses with integrated bite lift. Based on the Vitamin D3 and low-density lipoprotein (LDL) cholesterol levels at the time, as well as other blood tests, the patient prepared for a dietary change (Food Design, developed by the author) and a targeted orthomolecular micronutrient protocol four weeks before the planned treatment (BHP Supreme, developed by the author), in order to optimally support her body with the right nutrients for bone regeneration and wound healing. A diet of a great deal of sugar, wheat and cows' milk products, as well as food intolerances and toxins or vitamin and nutrient deficiencies, leads to a general inflammatory tendency of the body. In this case, Vitamin D3, zinc, magnesium and omega-3 fatty acids

were lacking for the structure and the regeneration of tissue. The body is often overwhelmed with healing processes by this deficiency situation—it switches, to hibernation mode, in which the body is not able to build new tissue, as it simply lacks the nutrients to do so. After four weeks of a dietary change and the micronutrient protocol, the patient presented with a preoperative Vitamin D3 value of 90 ng/ml and an LDL value of less than 1.2 g/l and thus had the ideal prerequisites for this complex biological treatment.

Surgical intervention

On the day of the surgery, the patient was given a single dose of an intravenous antibiotic (Sobelin Solubile 600, Pfizer) for infection prevention. In addition, 8 mg of dexamethasone (Dexa inject, Jenapharm) and a high-dose vitamin complex and mineral infusion were administered. Parallel to the intravenous treatment, 12 ampoules of blood were taken from the patient to produce Choukroun advanced platelet-rich fibrin (A-PRF) plasma membranes. The all-ceramic implant system (SDS 1.1 and 2.0, SDS Swiss Dental Solutions) used is made of yttrium tetragonal zirconia polycrystals, has a particularly aggressive thread design. Both the one-piece and two-piece implants have a pronounced tulip-shaped area of 3 mm in height in order to maintain and support the optimal biological width of the gingiva. The shoulder diameter at soft-tissue level is 5.0 mm for the reduced-diameter implant and 6.0 mm for the 4.6 mm implant. The two-part implant is virtually a reduced one-piece implant, which is extended above the gingiva, only after healing. The actual implant is completely inserted into the bone, even in the reduced-diameter variant, unlike comparable titanium implant systems. Depending on the height and texture of the gingiva, the implant may also be inserted a little deeper or more shallowly if a gingiva of more than 3 mm is present. This flexibility allows the surgeon to use implants of 7–15 mm in length with a single system. In particular, the tulip can be prepared so that the practitioner can operate completely under anatomical conditions. Especially in the areas of immediate implants, axial inclinations are unavoidable, because the implant should be positioned in the middle of the alveolar ridge, and in most cases, this does not correlate with the anatomical positioning of the teeth. It is therefore possible to correct the axial inclination by preparing the implant already during the surgical phase and thus intraoperatively producing an individual abutment. An axial deviation of up to 20° can be achieved without problems by the pronounced prosthetic platform.

The immediate implantation was performed under local anaesthesia in regions #12, 11, 22, 36 and 35, with one-piece implants. In regions #14 and 46 were two-piece implants used. In region #14, a 5.4 x 14.0 mm implant had to be used owing to the extensive apical



Fig. 13: Post-op frontal view of the long-term provisional protheses in the maxillary arch. **Fig. 14a:** Lateral view of the occlusion of the right side post-op. **Fig. 14b:** Lateral view of the occlusion of the left side post-op.

osteolysis. The hold was generated by the 6mm wide tulip and did not allow for any immediate loading. In region #46, an asymmetrical balcony implant was chosen, and it was inserted into the mesial root socket and primary stability was obtained. The distal root socket was lined with an A-PRF membrane, and above the implant, an A-PRF plasma membrane was used. No provisional was made because the implant was mainly stable only at the apical threads, and therefore it would have been too risky to load it directly. In region #36, a 4.6 x 14.0mm implant was inserted, while a 5.4 x 14.0mm implant was inserted into the distal root socket of region #46, for which primary stability was achieved for both at a torque of 35Ncm. The alveoli were lined with an A-PRF membrane for socket preservation. In order to form more attached gingiva, a membrane was placed under the buccal mucosa in all implant areas, and the flap was fixed with deep mattress sutures, approximately 5 mm below the cut edge, to ensure absolute positional stability of the periosteum and freedom from tension of the flap. This technique is crucial for the blood circulation and thus the preservation and development of the bone. In regions #12, 11 and 22, 14mm implants were also used. In region #11, a 5.4 x 14.0mm implant was inserted. Oval one-piece implants were used in the regions of the lateral incisors and premolars to cope with the oval cross

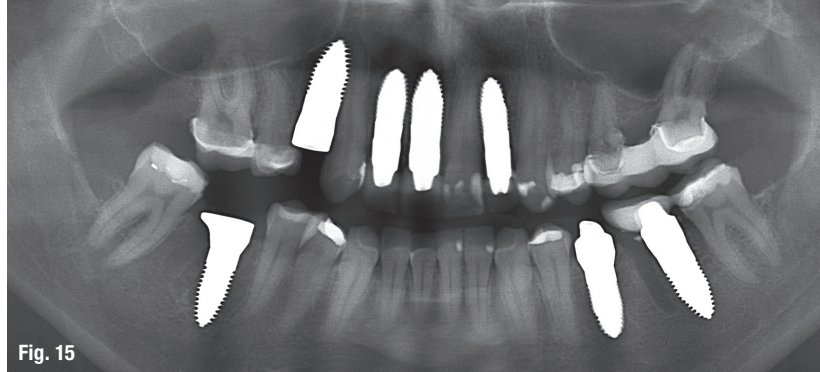


Fig. 15: Radiograph post-op.

section of the maxillary lateral incisors while still achieving primary stability at a torque of 35Ncm. All the implants achieved primary stability at a torque of about 35Ncm.

The immediate implantation alone had already enabled the bone to be activated. Since one usually drills beyond the socket, osteolytic bone areas are often found here, and these are not treated through conventional tooth removal. This was equally the case with the present patient. The perfect cleansing of these chronic inflammatory areas is absolutely crucial from a medical point of view, for the health of the patient on the one hand and for the osseointegration of the ceramic implants on the other. After the mechanical cleaning of the alveoli, disinfection with ozone and a neural therapeutic solution is done. Since zirconia implants heal only in absolutely healthy bone, attention should also be paid to osteolytic lateral lacunae and generally yellow bone areas (which



Fig. 16: Lateral view of the clinical situation after the healing period. **Fig. 17:** Frontal view of the implants after the healing period. **Fig. 18:** Lateral view of the implants in regions #35 and 36. **Fig. 19:** Lateral view of the implant in region #46. **Fig. 20:** Occlusal view of the maxillary arch. **Fig. 21:** Occlusal view of the mandible arch. **Fig. 22a:** Lateral view of the occlusion of the right side. **Fig. 22b:** Lateral view of the occlusion of the left side.



Fig. 23

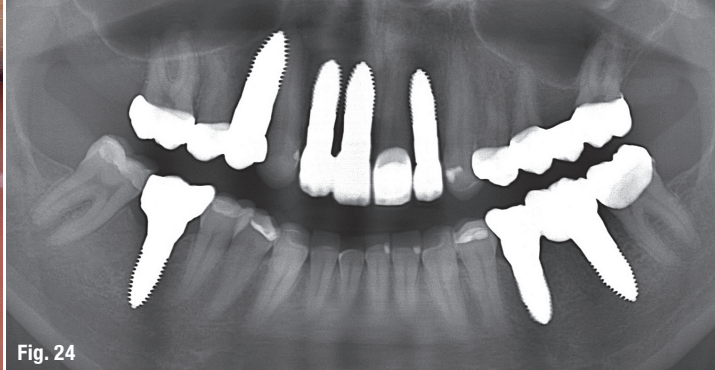


Fig. 24

Fig. 23: The final result right after insertion of the definitive restorations. **Fig. 24:** Post-op radiograph.

indicates LDL—fatty degeneration of the bone is a sign of chronic inflammation). Brånemark warned, “Yellow bone, no implants”. In order to counteract non-healing, this examination process is extremely important. The bite lift was produced asymmetrically and was done on the long-term provisional protheses extending from region #16 to region #14 and from region #37 to region #34. The two-piece implants were inserted at the gingival level. This procedure represents the optimal solution in the non-aesthetic but functionally riskier area. Six weeks after surgery, the patient reported again for a follow-up. All the implants showed a positive sound probe. Thereafter, the final protheses were discussed.

Prosthetic restoration

Five months after the implantation, the implants were exposed, and the teeth were again prepared for the ceramic denture in finishing touches and moulding processes. The impression for the definitive denture was taken three weeks later together with the dental technician. Two days later, the definitive crowns were placed. The partial crowns and veneers for teeth #13, 21, 23, 24, 34, 33, 43, 44, 45 and 47 were seated adhesively using an acid-etching technique and flowable composite. The remaining all-ceramic crowns and bridges in regions #16–14, 12, 11, 22, 25–27, 37–35, and 46 were conventionally seated with a glass ionomer cement. The occlusion and articulation were adjusted in canine guidance and the protheses fitted to the ceramic implants in minimal infraocclusion to compensate for the natural motility of the teeth and to protect the ceramic implants. All intra-oral photographs were taken immediately after the insertion (Fig. 23). For this reason, the gingiva seems to be somewhat irritated. To check the dentures and the bone, a panoramic radiograph was taken (Fig. 24).

Overall health improvements

In this case, treatment according to the concept of biological dentistry had a substantial beneficial effect. The patient no longer had chronic pain, bite problems or hypersensitivity in the tooth area. The patient had an increased appetite and no longer had indigestion, subjective intolerances of any food or the urge to urinate frequently. The cervical lymph nodes were reduced in number and size. Her spleen was no longer enlarged. She also showed an altered nail pattern, from short and brittle to strong nails, a sign of improved nutrient absorption.

Summary

Based on this patient case, one can see both the overall health component of biological dentistry and the high-end craft. This is the perfect symbiosis between the classic daily work of the dentist and the indispensable medical work. Surgically speaking, the optimal time for implantation, in my opinion, is the time of tooth extraction. The implant acts as an optimal socket preserver, supporting bone and soft tissue. In contrast to the conventional procedure with tooth extraction, requiring an interim prosthesis and a long waiting time, the time and expense for immediate implantation are significantly reduced for the patient, not to mention the reduced pain. With one- and two-piece all-ceramic implants, it is now also possible to perform riskier immediate implantation in the posterior region without the need for elaborate and unpleasant protective measures. Of course, the surgical protocol is crucial. Particular attention is paid to the thorough cleaning and disinfection of the surgical area to be restored with zirconia implants, as these only heal in perfectly healthy bone. This protocol includes targeted nutritional change, preliminary orthomolecular support, local disinfection with ozone and neural therapy, and immunological support with high-dose intravenous vitamins and minerals. An oral antibiotic can thus be completely dispensed with in most cases.

about the author



Between 2003 and 2008, **Dr Dominik Nischwitz** studied dentistry at the University of Tübingen, and he specialised in biological dentistry and ceramic implants. He is the founder of DNA Health & Aesthetics, a centre of biological dentistry in Tübingen. He serves as President of the International Society of Metal Free Implantology.

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