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A Case of Full-Mouth Rehabilitation Using Immediately Loaded Fixed Prostheses Supported by Corticobasal® Implants as Consequence of a Standardized Fixed Orthodontic Treatment

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Dear Readers,

the first ID Journal "Cranio-maxillofacial Implant Directions®" has appeared for 18 years (2006 – 2024). We see, however, that the focus of our work has expanded: We more and more correct the work of other treatment providers (dentists / orthodontists / periodontists) with the help of the tools and the methods we have developed in the last 18 years. For this reason, the decision had been made to add two more journals to the Implant Directions® repertoire from 2024 onwards.

Hence, we proudly present the

Journal of Unwanted Results and their Correction (JUR)

which will appear in English and Russian. Special issues in other languages can be produced on request.

Thank you for studying the articles and for the support given to all other colleagues and to the International Implant Foundation IF®.

At the same time, the position of Editor-in-Chief of JUR will be taken over by:

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Munich, 05.03.2024

Prof. Dr.

Antonina Ihde

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A Case of Full-Mouth Rehabilitation Using Immediately Loaded Fixed Prostheses Supported by Corticobasal® Implants as Consequence of a Standardized Fixed Orthodontic Treatment

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Abstract

Introduction and importance: The correct position and alignment of the teeth have a significant impact on the patient's appearance. Teeth malocclusion has a negative impact on patient psychology, ranging from reducing the patient's self-esteem to limited social interaction and depression. Although fixed orthodontic treatment corrects tooth malalignment, it can lead to various adverse effects such as widening of the alveolae, reduced stiffness of the PDL, increased plaque retention, root resorption, bone loss, and teeth mobility.

Case presentation: A 42-year-old female patient presented to the clinic complaining of recurrent pain and mobility in all of the maxillary and mandibular teeth. The patient had a history of fixed orthodontic treatment between ages 13 and 15 and she was unhappy with her teeth. The patient's intraoral examination revealed Grade I – II tooth mobility, and a just slightly incorrect tooth intercuspation, close to an Angle Class 1. A difference between the joint centric and the occlusal centric could not be diagnosed preoperatively. A multidisciplinary treatment plan was performed, including: teeth extraction, removal of periodontally involved tissues, immediate placement of Strategic Implant® and incorporation of fixed bridges on the implants. During the follow-up appointments, the patient presented with improved appearance and mastication, she reported high satisfaction and a significant increase in self-esteem. The new teeth were installed in an Ange class 2 relationship (without frontal contacts nor overbite), This position allowed normal mastication and the natural positioning of the tooth arches over the crests of the jawbones.

Clinical discussion: The utilization of a multidisciplinary team significantly improves treatment outcomes. The use of fixed prostheses supported by Corticobasal® implants provided the patient with an immediate functioning treatment modality with good peri-implant soft tissue result, stable, and aesthetically pleasing prostheses that highly improved the patient's satisfaction.

Conclusion: Immediately loaded fixed prostheses on the Strategic Implant® may be used as a reliable and fast solution

when it comes to treating late failures of the dentition. This implant treatment leads to a predictable and successful result and it resolves clinically all issues which the (late and fixed) orthodontic treatment had caused.

Keywords: Long term side effect of orthodontic treatment, Strategic Implant®, fixed prostheses supported by implants, fixed orthodontic treatment, immediate functional loading, relapse into Angle Class 2 after removing the natural and ailing dentition.

1. Introduction

The aesthetic position and alignment of the teeth have a significant influence on the patient's aesthetic appearance [1, 2]. Teeth malocclusion affects the patient's psychology, reducing self-esteem, limiting social interaction, and causing unhappiness of the patient which is often not focussed on defined details of the dentition [1, 2]. With the help of orthodontic appliances, this situation can be treated by aligning teeth within the arches and / or changing the relative position of the arches (Class II and III cases) [3].

The stress and compressive strain on the teeth during orthodontic movement induce changes in the desmodontal tissue's anatomy, nutrition and blood flow, leading to the release of different substances such as cytokines, growth factors, colony-stimulating factors, enzymes, and neurotransmitters that directly and indirectly affect the periodontal ligament (PDL) and the bone [4, 5]. These attacks result in the widening and resorption of the alveolae, reduced stiffness of the PDL, and tooth mobility [6], iatrogenic root resorption [7], and Temporomandibular Dysfunction Syndromes [8]. Teeth mobility may persist for a certain period after appliance removal, compromising the treatment outcome and resulting in treatment relapse [6]. Several host factors, degree of force, frequency, and duration influence the severeness of these adverse effects. A re-formation of a fully functional desmodontal tissue complex after the orthodontic treatment does not happen however [9].

Cortellini et al. [5] reported that 5% - 12% of the orthodontically treated patients may have gingival recession upon completion of treatment and up to 47% in long-term observation, which highlighted the importance of long-term observation. Little et al. [10] stated that 90% of relapses occur within years after the end of orthodontic treatment, with noticeable individual variation. This relapse can be attributed to the negative response of periodontal tissue remodelling, muscular imbalance, growth and ageing factors [11]. Teeth tend to migrate back into their previous (more stable) positions in the bone. Johnston and Little [12] considered the type of initial malocclusion, the patient's age, gender, the health condition of the soft tissues, patient compliance, and the retention protocol applied [11, 12] as determining factors that govern the possibility of an orthodontic relapse. A problem that will adversely affect the patient's health and / or aesthetic appearance and may necessitate in some cases correction.

The case which is under report here did however **not** show relapse, but a clinically stable joint centric in alignment with the occlusal centric [14].

This is the first case report on using the technology of the Strategic Implant® in order to correct a failing orthodontic treatment. This failure was causing tooth mobility, partly subconscious pain and had altered the masticatory function. The patient provided informed consent for both the treatment and the publication. The case was in line with SCARE guidelines [13].

2. Case Presentation

A 42-year-old female patient presented to the clinic complaining of recurrent pain and mobility of the maxillary and mandibular teeth as well as periodontal infection. The patient was very depressed, as she had a history of fixed orthodontic treatment between ages 13 and 15, she assumed that this had solved all problems of her dentition and of the masticatory system. The intraoral examination revealed a gummy smile (Fig. 1).

Fig. 1: *The pre-operative intraoral view of the patient at the time of presentation reveals a misaligned centric intercuspation, tooth 11 tilting, infraocclusion of the posterior teeth in the left side of the patient, the frontal group teeth are in contact with each other.*

The intraoral examination revealed mobility Grade I-II for all teeth, and anterior tooth contacts associated with pain on chewing (Fig. 2a, 2b). The temporomandibular joint (TMJ) examination did not reveal crepitus nor pain. The patient reported no other medical conditions, no allergies, nor an adverse medical family history.

A panoramic and lateral cephalometric X-ray showed horizontal bone loss, periapical radiolucency on tooth 36, missing teeth 15 and 25, one conventional implant replacing tooth 45, amalgam restorations on teeth 17, 16, 25 - 26, 37, 46, and 47, the lower front being overly strong protruded, molars tilted at the midline, and condyles which had become flatter than normal (Fig. 2a, 2b).

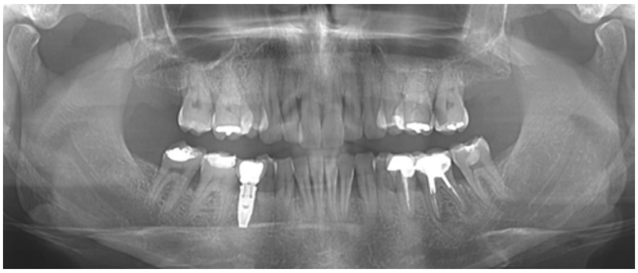

Fig. 2a*: The pre-operative panoramic view shows two missing premolars in the upper jaw, closed gaps, and a mesial tilt in all four molars. The position of the upper dentition relative to the anatomic landmarks of the bone indicates that the whole arch had been elongating downwards (without the bone). Both TM joints appear anteriorly flat.*

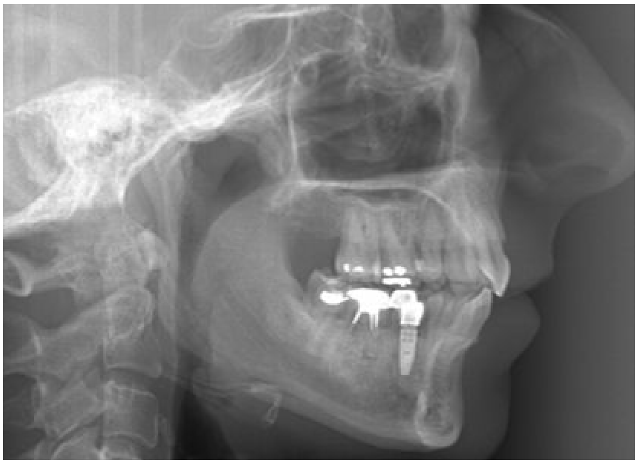

***Fig. 2b**: The pre-operative cephalometric pictures reveals a regular relationship between the teeth (considering that two premolars were missing in the upper jaw), with both frontal groups touching each other and the lower front teeth protruding.*

A multidisciplinary team was formed and all the treatment options were discussed with the patient. The patient was severely depressed, requested urgent treatment, and insisted on removing all teeth if a replacement with implants would be possible right away. A treatment plan including an immediately loaded fixed prosthesis supported by Strategic Implant® was approved by the patient. The patient was happy she had finally found treatment providers which understood that only the removal of all teeth (and subsequent treatment with modern implants) would resolve all issues for good. Implant surgery was done in local anaesthesia and i.V. sedation. The intervention was protected by a strong local disinfectant (Betadine® solution, 5%) and prophylactic oral antibiotic treatment.

The patient was requested to rinse her mouth with Betadine® 10% for 1 minute, 3 times per day, for 5 days after surgery. Local anaesthesia was induced (2% lidocaine with epinephrine, 1:100000). A flap was raised: the bone's crest in the upper jaw was significantly resorbed on the palatal side (Fig. 2a, 2b). Both the teeth and one 2-stage implant were removed.

A significant reduction in the vertical bone in both jaws was done to allow the new teeth to be placed in an aesthetic position and to provide enough space for zirconium as bridge material. An implant osteotomy was performed, and six BECES® and six BECES® EX implants (Simpladent® GmbH, 8737 Gommiswald, Switzerland) with appropriate length and width were inserted into the upper jaw (Fig. 2a, 2b), while nine BECES® implants were inserted into the lower jaw. Implant placement was performed respecting the rules as layed out in the 6th Consensus Document of the International Implant Foundation IF®, Munich, Germany. The sockets were sutured to promote soft tissue healing and to protect the callus. Implants were bent for parallelism [14]. Impressions were obtained. Antibiotics and analgetics were prescribed.

The maxilla-mandibular relation was registered in the "joint centric" position [14] to correct the pre-operative situation of the lower protruded front teeth, while the upper front teeth were also protruded. Already right after bite taking it became clear that the "good pre-operative occlusion" was owed to a "sunday bite" and a habitual anterior positioning including an anterior pattern of chewing (Fig. 3a, 3b).

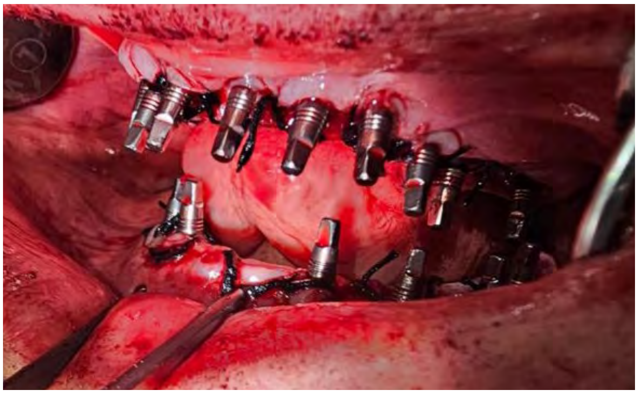

***Fig. 3a**: The immediately post-operative intraoral picture shows Corticobasal® implant distribution and reveals that the frontal groups of implants are not in contact with each other; the lower jaw has relapsed out of an anterior "occlusal centric" into a more distal "joint centric" after occlusal contacts were lost. This shows that the result of the orthodontic treatment was a habitual "sunday bite".*

***Fig. 3b**: A lateral view of the mounted maxillary and mandibular models in the articulator shows how large the sagittal step between the upper and lower jaws is in reality, i.e. how large the wrong positioning of the temporomandibular joints was in reality: the orthodontist had "treated" (rather: artificially forced) the mandible close to a frontal contact position between the upper and lower jaws. Over-elongation of the bone segments in the distal maxilla created massive problems for the prosthetic team due to a lack of available vertical space.*

The next day, a tooth try-in was performed and the position of the individual teeth were corrected according to the patient's aesthetic requests. On the third day, final zirconium bridges were inserted and cemented (Fuji Plus permanent cement, Fuji Co., Japan). Occlusal and masticatory adjustment was made on days four qnd five, and follow-ups scheduled after three months and twelve months. Post-operative panoramic and lateral cephalometric radiographs were acquired (Fig. 4a, 4b).

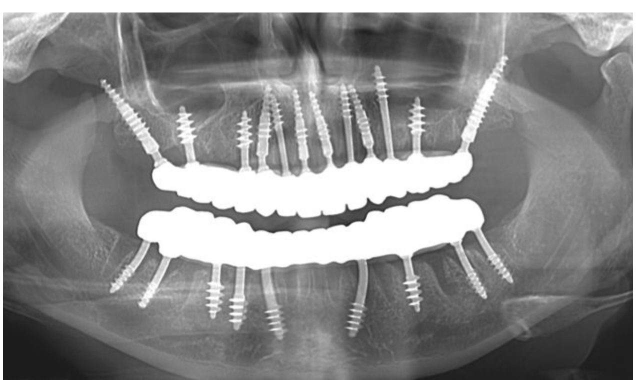

Fig. 4a: *A post-operative panoramic overview picture after tooth extraction, implant placement, and incorporation of two full zirconium bridges.*

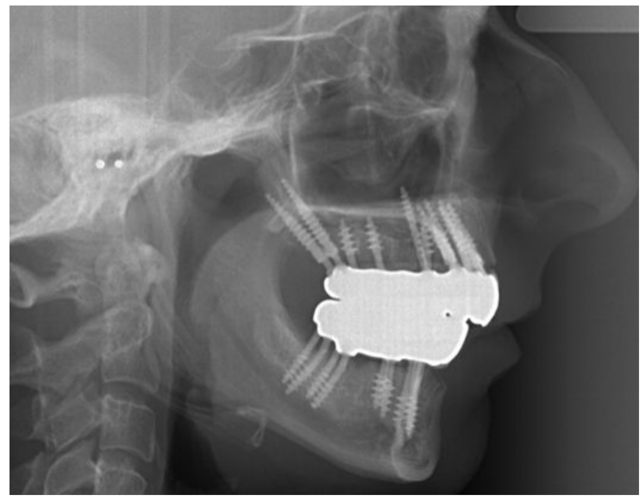

Fig. 4b: *A post-treatment lateral cephalometric picture: the patient requested retrusion of the upper frontal group "as much as possible" because the sagittal step between the arches revealed a strong Angle Class 2 jaw relationship.*

The patient reported high satisfaction with the treatment outcome, including aesthetics, mastication, and phonation, which had a great impact on improving her self-esteem without reporting concern regarding the anterior zero overbite (Fig. 5).

***Fig. 5**: Comparison of the clinical view before and after full extraction and treatment with Corticobasal® implants. The implant-borne restoration allowed the creation of a symmetric and harmonical smile, with the arches in the correct position and inclination. Due to the extraction, the elongation caused by the orthodontic treatment was corrected in one single surgical step.*

During the follow-up appointments, the patient presented with good peri-implant health, fully stable bridges without complications and a “normal” bilateral pattern of chewing, although the tooth arches were positioned on the jaw bones resembling an Angle Class 2 position.

3. Discussion

Nowadays, with the paradigm shift towards aesthetics and a beautiful smile, the number of adult patients seeking orthodontic treatment with fixed equipment has increased. Regrettably, reports indicate a surge in periodontitis onsets following this treatment. A recent survey reported that 50% of 30-year-old individuals undergoing orthodontic treatment display symptoms of periodontitis [7]. This correlation between periodontal and orthodontic therapy, particularly in adult patients, highlights the need to explore the reasons for the side effects.

Orthodontists are brought up inside a closed universe of thoughts and principles which seemingly do not reflect the rules of the environment of the teeth, namely the desmodontal gap and the jawbones. The question **how fixed appliances act** inside the bone, what their effects on their direct environment are, is rarely a part of their education. They learn rather **how to work** with these devices. They follow therapeutic concepts which surely have an effect, but just as sure (and as we explain here), they have initially hidden side effects. Today, we see more and more orthodontically pre-treated cases in their adult years, and we get a good overview on long-term side effects of these treatments. In this article, we would like to explain a few details on how orthodontists (really) reach their “results” and how and why such massive side effects are caused. The third author himself has spent many years during the first phase of his dental professional life with orthodontic treatments. If this experience is now counter-checked with what we know today about the properties and possibilities of mineralized tissues in the jawbones, we do get a clear but scary picture about what the effects and side effects of (late and fixed) orthodontic “treatments” are.

Not everything which is done today in orthodontics is in fact that scary. It rather depends on how things are being done and on the age of the patients:

Functionally oriented treatments performed in young patients, e.g. during the age of 6 to 10+ with removable, functional devices such as a Frankel apparatus or with an Elastic Open Activator, side effects are not found if the devices are used e.g. 16+ hours per day.

The devices work fast and predictably, provided the children are supervised and wear the devices even longer, i.e. up to 24 / 7. This type of treatment utilizes the natural growth of the individual, it is done during a phase of growth while the (osteonal) activation frequency is still very high, and the results of treatment can be truly amazing. Almost everything becomes possible in a well growing child, and if done during the optimum phase of the growth. The big plus of these devices is that (if properly used) the teeth will never leave the borders marked by the corticals of the jawbone. This by itself makes this treatment safe as the results achieved are true changes on the bones morphology and these results are lasting.

Unfortunately, parental control over children has become questionable during the last 25 years in western countries: often both parents work, and the removable devices are not kept reliably in the mouth of the children during the most critical growth phases of life. Schools and other caretakers find it difficult to keep an eye on the children, especial during challenging phases of the individuals upbringing, i.e. during puberty.

The “way out” is offered by orthodontist who are offering fixed appliances and (mostly) straight wire technology. The downside of these appliances is the deliberate, merciless and forceful movement of single teeth. The wire determines the direction of the movement, while the bracket determines the angulation of the tooth relative to the wire. Given such powerful devices, the teeth will not automatically remain within the natural borders of the corticals, they are pushed through or along them and this results in remaining damage:

The most damaged structures are the desmodontium and the internal blood supply of this organ.

Teeth move slower against resistance of corticals, but they move. At the same time, reciprocal resorption of roots can be observed and allows the teeth to pass the obstacle faster. This resorption will later severely influence the life expectation of the teeth. This alone questions the claim that with such a treatment, the chances for long-term survival of teeth is improved, a claim which is used to justify an orthodontic treatment as such.

Once teeth penetrate corticals. the later are locally removed but they are typically not replaced or repaired. If we do not see a reduction of the clinical crest, it is often due to the soft tissues which mask the destruction for some time, often for years.

If wires are placed in bi-maxillary cases, the arches are usually “moved towards each other”, for example with the help of elastics. Over time, this approach is successful from a clinical point of view, the patients arrive in the desired “Angle Class 1” intercuspidation after some time. But what is the price of this and does this really “work”?

There are a number of unpleasant answers to this question: if elastics are used to move arches without a high-pull headgear controlling the vertical, the (premobilized) tooth arches including some of the alveolar bone are sliding away from the base of the jaws, the arches actually elongate for at least two reasons:

1. During the time when fixed appliances are in place, patients experience pain, especially during mastication. The pain

is mainly hypoxic pain and stems from the desmodontium. This pain leads to a significant reduction of chewing forces and hence intrusive forces on the teeth are low. Such forces would prevent the elongation of the tooth arch. Forces are reduced in the upper and the lower jaw.

2. At the same time such Class 2 elastics provide forces in different directions: they provide not only horizontal forces which move the arches towards each other, but also force vectors with a vertical component. In other words: against all hopes, they never work only in sagittal direction. Over time, we will see an increase of the vertical dimension through extrusion / elongation in both jaws, and these extrusions will take place (initially) with the alveolar bone.

If this happens, i.e. the extrusion is taking place with the bone, the case as such will look ok from a periodontal point of view for a number of years. But in virtually all such casesm the total amount of bone is overly increased during the phase of tooth elongation. Unfortunately, the bone-maintaining function per mm^3 of bone will sooner or later not be enough: as soon as disuse atrophy of the bone sets in, the problem becomes apparent and the patient case is moved over to periodontal department.

One way to avoid the elongation would be to apply a high-pull headgear for 16+ hours per day to keep the upper tooth arch “up” (and the teeth inside the native alveolar bone). This measure would however lead to a severe decrease in the acceptance of the treatment by the patient or the parents. It will also make it more difficult to move upper molars which have a considerable part of their root tips inside the maxillary sinus. These roots are encapsulated by a cortical which is difficult to resorb in order to come to horizontal movements. The problem becomes smaller due to the vertical forces of the elastics which permit and promote elongation. Topcuoglu et al. [23] emphasize the need for due consideration of psychological parameters before and during treatment with extraoral appliances, particularly with regard to depression and anxiety.

Another way of preventing the mentioned side effects would be a cortical retention during the treatment phase with the help of bone screws.

Another way to avoid that the high-pull headgear has to be used only for a short time (e.g. six to eight weeks) would be to create strong remodelling at least in the upper jawbone. This can be done for example by removing the wisdom teeth early (i.e. at the age of 11 - 13), and right before the start of the orthodontic treatment. Then, when remodelling is in full run, e.g. after four weeks, fixed appliances are installed and a short time later the headgear is used to create a situation where the upper jaw slips dorsaly “like butter” in zero time because the bone is soft. The jawbone relationship is thereby corrected within a few weeks and elongation of the teeth in both arches are avoided. This treatment is however only possible in the upper jaw.

Orthodontic treatment with fixed devices (especially after most of the individual’s growth has happened) leads to a redistribution of cortical bone mass: In such cases, we see soft alveolar bone and thin and fragile corticals around it, whereas the basal cortical (e.g. the floor of the nose) is thick and highly mineralized. Since macro-trajectorial load-transmission cannot go through the alveolar bone while this bone is under the strong influence of the orthodontic treatment (because the bone including the corticals is softened up or even missing) all macro-trajectorial forces will be directed through the basal bone of the affected jaws.

In short, the following can be summarized:

- In many of the cases we saw as adults, a functional desmodontal space was missing: fresh extraction sockets were hardly bleeding or not bleeding at all. The bony site looked rather like cases of profound and chronic periodontitis: the cortical surfaces of such bone areas show no penetration by intra-bony vessels. Teeth were extra-territorialized and easy to extract although some of them were not exactly mobile. They were in a way interlocked with the bone and we often saw a bone-like layer of apposition on the dentine. A number of them were ankylosed

- The removal of teeth in such cases is very easy (except for the few ankylosed teeth)

- All teeth which were connected to the fixed braces had kept some mobility. On the pressure side of the tooth (i.e. the side towards which teeth were moved), even significant vertical bone loss was visible after raising a flap during extraction

- The tooth arches are pulled by elastics into the desired occlusal centric. This centric is, however, not the same as the joint centric

The significant tooth mobility revealed in the prescribed case is in accordance with many investigators [16, 17]. According to Aziz et al. [16], discomfort, pain, awareness of the importance of appliance wear, the dentist-patient relationship, and self-assessment of malocclusion severity are the main factors influencing compliance with orthodontic treatment [16]. Reported orthodontic relapse features include teeth crowding or spacing, increased overbite and overjet relapse, and instability of Class II and Class III molar relations [17]. The later is characterized by a “sunday bite”.

We would like to point out that tooth mobility is an undisputed and significant reason for tooth extraction. From this point of view, an orthodontic treatment first of all prepares teeth for later extractions. It seems that the providers of orthodontic treatments are not consciously aware of the mentioned circumstances.

Greenbaum and Zachrisson [18] matched these observations, reporting that excessive force application during orthodontic treatment can prevent the repair and remodelling of the alveolar bone and consequently may lead to root resorption, attachment loss, and an increased risk of uncontrolled bone loss. Rafiuddin et al. [19] reported that tooth discolorations, enamel decalcification, periodontal complications including open gingival embrasures, root resorption, nickel and chromium allergic reactions, and treatment failure or relapse are the main iatrogenic circumstances associated with orthodontic treatment.

On the other hand, the prolonged orthodontic treatment time in the presented case adversely affected the patient’s oral and mental health, resulting in reduced self-esteem and depression. A result that matched the findings of many other investigators [9, 22, 23], including Amin et al. [22], who stated that extended orthodontic treatment for more than three years can cause even mild depression in orthodontic patients.

The reduced self-esteem of the patient

following treatment relapses is in line with Aziz et al. [16], who considered that a lack of patient warrant and compliance may slow the treatment response or may result in treatment failure. Luchian et al. [9] highlighted the increase in patient distress following orthodontic relapse and emphasized the importance of informing the patient of all the treatment prognosis aspects. Alfuriji et al. [24] highlighted the importance of an interdisciplinary treatment approach (regarding orthodontic treatments) to achieve optimum esthetical and functional treatment outcomes.

Orthodontic treatments may lead to tooth elongation, within or without the bone, thereby increasing the total bone mass. This is considered an advantage by some treatment providers. However, the masticatory forces will go down during the treatment because of the pain of chewing during treatment [23]. This sooner or later leads to disuse atrophy, which resembles a periodontal breakdown and is therefore often misinterpreted. Hence, the use of the cortical and basal bone plays a crucial role in choosing the appropriate implant system when it comes to restoring such cases.

Of course, thorough bone reduction is part of the surgical plan. This is necessary to anticipate the future additional resorption of bone segments which contain elongated teeth and bone segments. We assume today that the technology of the Strategic Implant® is an optimum treatment choice [14, 25 - 29] due to the easy way of implant placement and the use of stable corticals only.

The chosen treatment protocol has yielded several benefits, such as promoting optimal peri-implant soft tissue health due to the smooth surface of the implant, reducing biomechanical failure due to the monoblock implant design, reducing treatment time due to the immediate loading protocol, significantly improving patient psychology, and restoring patient self-esteem. Excellent long-term treatment outcomes have been reported by many investigators, including Ihde et al. [14, 25], Ahmad et al. [26], Awadalkreem et al. [27, 28], and Lazarov [29].

The good peri-implant health and the high improvement in patient satisfaction reported in this case are in line with many investigators, including Awadalkreem et al. [28] and Lazarov [29].

4. Conclusion

The use of fixed prostheses supported by implants using the Technology of the Strategic Implant® can be a successful treatment modality in cases of long-term side effects (failures) of orthodontic treatments. This fast and effective implant treatment leads to a significant and immediate improvement in the patient's oral health, function, self-esteem, and quality of life. It allows for removal of the whole compromised dentition. Often this results in a repositioning of the mandibular joints into joint centric: this process should not be mixed up with the "relapse" of the treatment over time.

The side effects of fixed orthodontic treatments should not be underestimated and patients must be informed about the possibility of late full failures (at the age of 30 - 40+) and that these failures typically begin with compromised periodontal health.

In our view, teeth tend to find their most stable position within the jawbones by themselves.

Moving teeth out of their stable position in order to improve aesthetics is a doubtful aim. Likewise, changing the Angle Class towards the "normal" Class 1 might be a doubtful aim.

Cases which turned out to be a full failure after only a few years post orthodontic treatments are frequently treated in our clinic.

The fact that such cases exist questions the claim of the orthodontic treatment providers who justify their treatment by claiming that teeth "in a better position" will be easier to clean and therefore, their chances for long term survival are better.

The opposite seems to be true: after fixed orthodontic treatment, the full loss of the dentition can be observed in a number of patients after they reach the age of 30 - 40+.

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The Foundation of Knowledge

Restauration of a Patient Case After Multiple Losses of Conventional Oral Implants

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Abstract

The occurrence of periimplantitis (PI) in conventional dental implantology is an unsolved problem which affects a vast and constantly increasing number of patients. Once periimplantitis appears, significant amounts of jawbone get lost in a short time. There is no cure for periimplantitis, hence treatment providers can only accompany the patients on the "road downhill".

Typically, implant practitioners do not speak clearly about the situation. Hence, it often requires the patient's initiative to solve the problem simply by getting the implants removed. The initial treatment provider does not openly reveal to the patients that the only reason for the problem is the wrong initial choice of the implant brand and design.

This article shows how a typical patient case after multiple implant losses can be rescued in a few days with the help of the Strategic Implant®. This corrective intervention is done by treatment providers authorized for this technology in an immediate functional loading protocol.

Keywords: Periimplantitis, bone loss, removal of conventional implants, immediate functional loading, corrective intervention.

Introduction

The occurrence of periimplantitis (PI) in conventional dental implantology is an unsolvable problem which affects a vast and an increasing number of patients. Manufacturers of traditional 2-stage implants recently blame "immunological reasons" for the occurrence of this disease. They neglect the fact that 2-stage (2-part) implants in most cases simply are too large in diameter and in length, and that the rough (initially endosseously placed) implant surfaces get colonized by bacteria as soon as bone loss starts. Periimplantitis is in reality a chronic opportunistic infection without any chance for healing nor for regeneration, until the implant is finally removed [i, ii].

The onset of regular periimplantitis is seen two to three years after implant placement and after the implant is osssेointegrated. In cases where more than five implants per jaw are inserted, "fast-track periimplantitis" is observed: after twelve months, periimplantitis is already seen in 80% of such cases. The reason for this strong increase of periimplantitis is that after placement of a big amount of implants (more than five per jaw), the amount of remodelling is much higher and bone loss due to this remodelling happens fast and more extensively [iv].

Although such alarming figures are published frequently in literature, the community of conventional implantologists keep on working in their traditional way. Only a few of them are ready to learn new techniques of oral implantology, such as the Technology of the Strategic Implant®. A number of studies with large amounts of implants included have shown that these implants do not lead to periimplantitis [v, vi, vii, viii]. Beside this, they are always used in an immediate loading protocol and hence, bone augmentations are never a part of the treatment plan.

In this article, we show how a case with severely destroyed jawbones due to periimplantitis can be restored within a few days and in a very simple manner.

Material and Methods

A 61-year-old male patient, heavy smoker, no known diseases, requested help in our clinic after suffering from periimplantitis for many years. Most of the implants had been lost already. The treatment provider had, however, left three implants in the lower jaw to prolong the time-span between initial treatment and total failure. By doing this, the treatment provider carries the responsibility that these unsuitable 2-stage implants have dramatically increased the amount of damage to the jawbone.

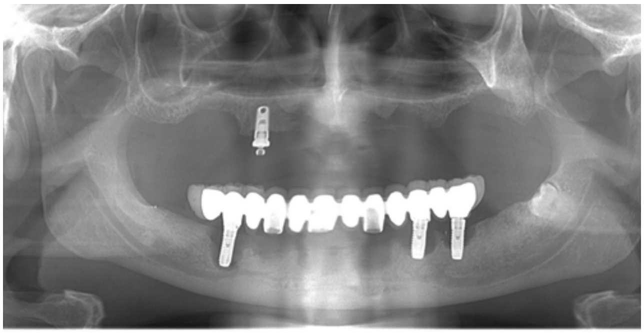

***Fig. 1**: Panoramic overview of the patient's jaws. In both jaws, we see severe destruction of the jawbones, which were created by "2-stage implants" affected by periimplantitis. All the implants (also those which are not visible anymore on this X-ray) should have been removed much earlier[1].*

[1] The German dentist and author Dr. Gerhard Hetz already explained the reality in the year 2001 as follows: "Those patients who lose their 2-stage implants early (before osseointegration occurs), they are the lucky ones. Because at least they keep their jawbone." (Implantologie Journal 09/2001, Germany). He was fully right. Today, we have to accept that during the last more than 20 years, nothing has improved within the Method of Osseointegration.

Fig. 2a: *The pre-operative lateral (cephalometric) radiograph of our patient revealed a severe Angle Class 3 jaw relationship at the present height of the bite.*

Fig. 2b: *After removal of the implants and the bridge, it became apparent that during six years of usage, three out of six implants had been lost and removed from under the bridge, and that the remaining three implants had failed long ago. They were kept in to prevent the true situation becoming visible. As also in the upper jaw six implants had failed, while the last one was removed by us. A total of 13 implants (100% of the implants placed initially) had failed within six years. This case casts severe doubts on the "statistics" which the renowned implant manufacturers publish regularly, as these statistics show excellent long-term results even after ten years and more. It seems that we cannot trust the literature.*

Large bone defects, generalized atrophy and a severe Angle Class 3 jaw relationship were the three major challenges provided by this patient case (Fig. 1, 2a, 2b). All remaining implants were removed and in the same appointment, a total of ten implants were placed in the upper jaw and seven implants in the lower (Fig. 3). Right after this, the impressions were taken and the inter-jaw relationship was registered.

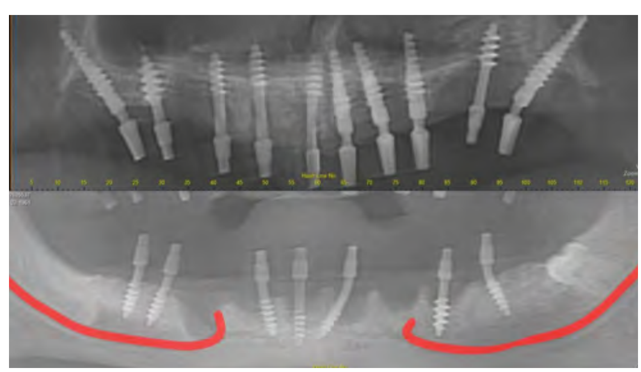

Fig. 3a: *A combination of BCS® (single-piece Strategic Implant®) and BECES® EX (single-piece polished compression screws) were placed in the upper and lower jaw, using the 16 Approved Methods of Implant Placement in Cortical and Basal Implantology[ix].*

***Fig. 3b**: Clinical view on the implants in upper and lower jaw right after placement. Areas where implants were freshly lost had mostly been avoided.*

Results

After a successful tooth try-in, two circular full zirconium bridges were manufactured and cemented with Fuji Plus permanent cement.

The bite was raised with the help of the two bridges which allowed to some extend a decrease of the ANB angle and support for the upper and lower lip (Fig. 4).

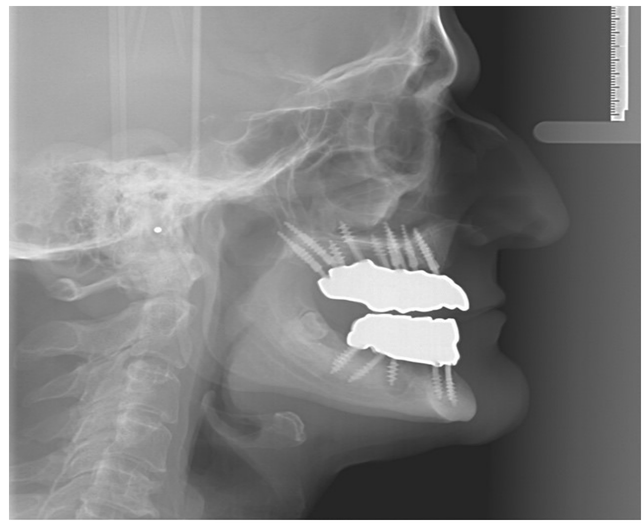

***Fig. 4:** The post-operative cephalometric picture shows that a good support of the upper and lower lip has been achieved and that the bite was significantly raised through the bridges.*

***Fig. 5**: Clinical view after cementation of the two full zirconia bridges. The upper arch is placed significantly in front of the upper alveolar crest. Nevertheless, both frontal groups cannot touch each other during occlusion, nor through mastication and protrusion. This concept of treatment has been described by Ihde & Ihde and is the standard process for the field of oral implantology, especially when immediate loading protocols are applied.*

The patient resumed normal masticatory activity on the day of cementation and expressed large gratitude to the surgeon and the prosthetic treatment providers which have done the full treatment within only three days. For the first time after years of suffering, his oral cavity was free of nagging infections.

About one year after this corrective intervention (i.e. switch to polished and thin implant for cortical anchorage), the implant in area 35 lost contact to the bone (Fig. 6) and was removed from under the bridge. Later, this implant was never replaced and the extraction socket of this implant healed uneventfully (Fig. 7, taken eight months after implant removal). As reason for this implant loss, we assume that the wide open crestal bone wound in area 35 in combination with missing or weak anchorage of implant 35 (it was presumably placed in IFM 14) had lead to the implant loss.

If the site around implants placed in IFM 14 get infected, the typical reaction is a relocation of the lingual cortical towards lingual.

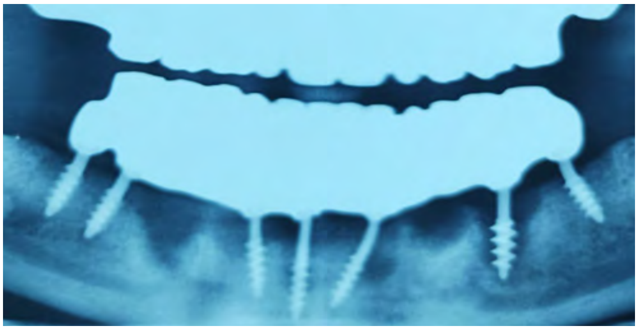

Fig. 6: *The implant in area 35 had lost contact to the bone about one year after the treatment. This became apparent at the twelve month follow-up. The implant was removed from under the bridge by cutting it off horizontally. The big advantage of polished implants is that they can be removed easily in such events because they do not osseointegrate!*

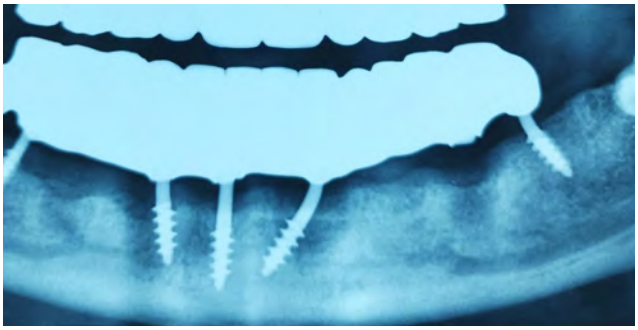

Fig. 7: *eight months after the implant 35 was removed, the bony defect had healed almost fully.*

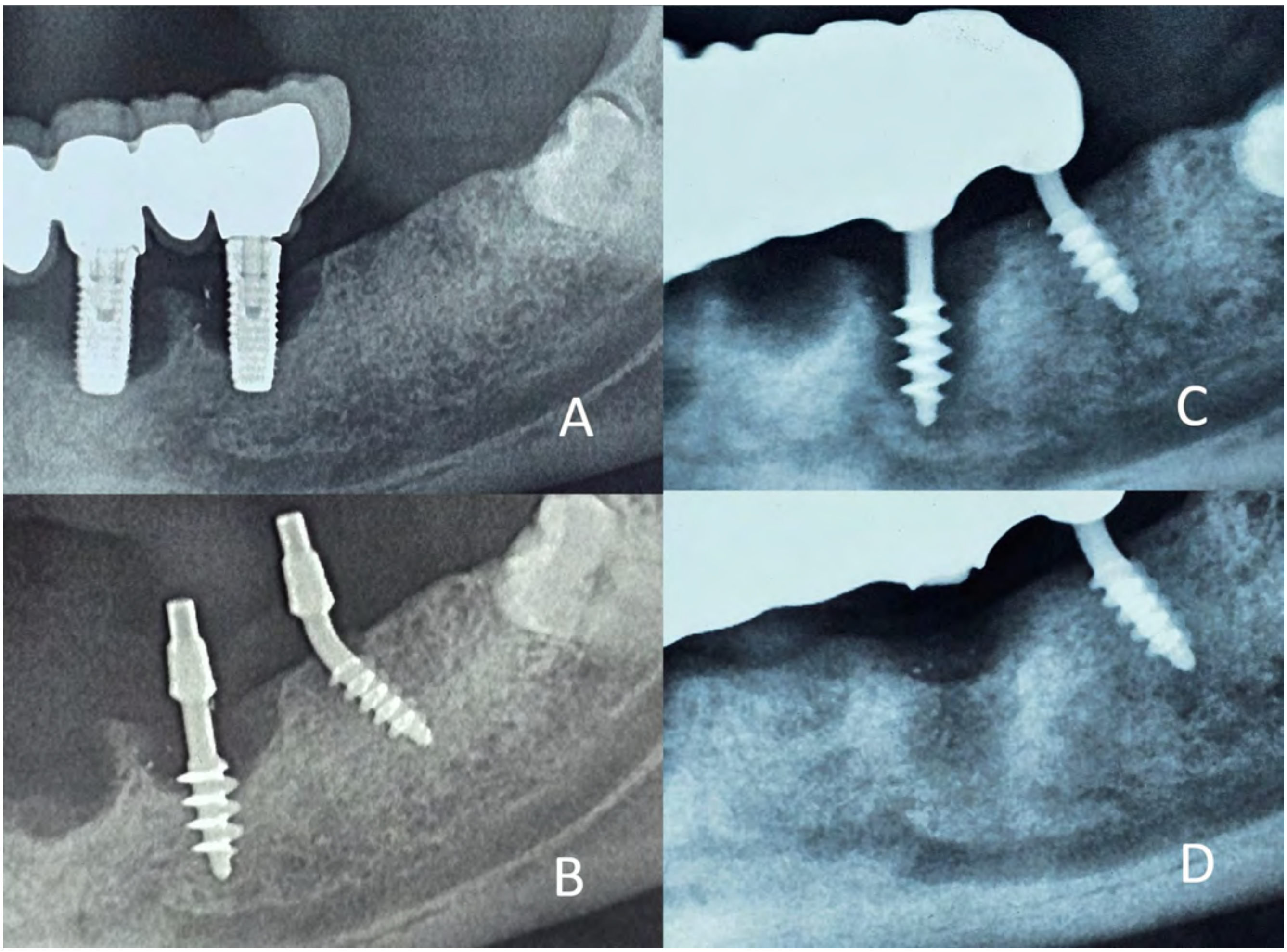

***Fig. 8**: Shows details of the healing of the bone and loss of the Corticobasal® implant 35 as well as the final bone healing eight months after removal of this implant (D). Other than the former implant designed for osseointegration, no permanent bone loss was found after implant 35 was removed. Even the former periimplantitis bone site 35 seems to have filled with bone under the good function.*

Discussion

In today's oral implantology, as a rule, implants are chosen which are too large for most of the jawbones. The path of treatment in the field of "osseointegration" is supported by (third-party funded) universities which receive funds not only from implant manufacturers but also from manufacturers of bone augmentation material. Working with (for) too large implants usually more than doubles the income of a professor, while the taxpayer rewards them with a significant base salary.

In the case shown here, we have used thin and polished Strategic Implant® combined with compressive implants to make the best use out of the remaining bone (Manufacturer: Simpladent® GmbH, 8737 Gommiswald, Switzerland). Both implant types provided a 2 mm mucosal penetration zone (polished) which allowed us to place the implants everywhere we wanted them, without any bone augmentation.

The mode of function is however different in the two types: Strategic Implant® anchor in the 2nd or 3rd cortical of the jawbones, they actually partly penetrate these corticals everywhere in the upper and in the distal lower jaw. The surgeon had chosen resorption-resistant bone areal for the placement wherever possible. Polished compressive implants gain stability through the compression of spongious bone as well as through cortical anchorage. Both implant types were used in a synergistic way, and they allowed to carry out such a treatment within a few days in an immediate functional loading protocol.

The alternative treatment to our approach would have been removal of the implants, waiting for the bones and soft tissue to heal and finally trying bone (block) augmentation and sinus lifts to generate vertical and horizontal bone supply. Hardly any patient is willing to undergo this. And that is the reason why patients keep on suffering with the failing 2-stage implants for months and years while their jawbone melts away in a massive infection. Even if a patient underwent this procedure, there is no guarantee that the same problems will not appear again after only a few years, nor that the corrective intervention (including bone augmentations of all kind) would be successful enough that the placement of new implants could even be tried. The question must be raised why still so many implant practitioners prefer to use the outdated method of "osseointegration" and placement of implants in the 1st cortical only. It is well known that this cortical is prone to resorption (atrophy).

A good part of the answer is that the universities will never blame anyone if periimplantitis "occurs", as the personnel in these institutions have been trained (or rather ordered) to think and tell that periimplantitis is "unavoidable" and not the fault of a treatment provider.

A closer look behind the scenes of the implant profession makes clear why the Corticobasal® technology is not taught in most European universities: third-party funding (official and non-official) limits most universities in deciding freely on the content of their teaching, which means that the university teaching is at least "blended". The universities seem not to respect the interests of the patients and they neglect progress in the profession unless they are heavily paid. The behaviour of these institutions is without question morally wrong, especially when we consider that these institutions are paid with the tax-payer's money. The problem is well known however [xi].

As a result, today's dental universities (actually better designated as dental schools) are preaching medical monotheism (and actually often useless treatments with only short-term outcomes in general) instead of opening the eyes of their students and delivering a broad and modern spectrum of knowledge.
Another result is the lack of progress in dental treatments. Practitioners which find out later about the true possibilities of modern oral implantology tend to revolt against the old teaching[xii] and in return, interested parties try to keep them silent. The teaching at today's universities is based on their own publications, although we know today that a shocking number of around 50% (at least) of these publications are assumed to be wrong or even deliberately false [xiii].
This fact is accepted even within the tribe of the researchers, since publications are necessary steps to advancements in an academic career.

Conclusion

Periimplantitis is a severe and dramatic development around traditional (2-stage) dental implants with rough surfaces. Such implants should be avoided, because once periimplantitis appears the development cannot be treated and it leads to severe bone loss and finally to implants losses.

When applying the principle "primum nihil nocere", large diameter oral implants and rough surfaces can never be used.

Immediate oral rehabilitation of cases with profound periimplantitis is possible if polished, cortically anchored implants are used and the 16 approved methods for placement of these implants are applied.

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