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Case Report

Immediate Functional Loading of Dental Implants – A Case Report

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Abstract

In this modern era dental implants are one of the most accepted dental treatment modalities for the rehabilitation of missing teeth. With the advancement and evolution in implant dentistry there is path paved for immediate and quick results for the patient. This is possible with the science of basal Implantology where the patient can be rehabilitated with dental implants and permanent fixed teeth within 72 hours. This article presents a case report for the same.

***Keywords:** Basal implants, Osseo fixation, immediate functional loading*

Introduction

Today dental implants are one of the most accepted dental treatment modalities for the rehabilitation of lost teeth and their function. A clinician offers different treatment plans and the patients can decide between the options available and suitable for them. Most treatment providers do not have a full overview of the treatment possibilities currently available; so most patients still do not get the desired treatment today[1].

Two-stage dental implant systems are the mainstream devices in most countries. The protocol includes several steps and a long waiting (healing) time. The patients have to wait for a long period before the prosthesis is fabricated and inserted.

Today an alternative to conventional implantology is available and is widely accepted as a treatment modality in the field of dental implantology i.e. 'BASAL IMPLANTS'. The term was generated under the aspect that basal implants utilize the cortical bone and create multi-cortical anchorage for load transmission. The cortical bone is dense, stable, less reactive and has a strong tendency to repair.

This field follows the principle of orthopaedic surgery (traumatology)[2,3].

BASAL IMPLANTS consist of axial and lateral implants being smooth or surface treated. Surface-treated axial implants (e.g. KOS) are used in combination with basal implants. These implants corticalise spongious bone, i.e. they are placed in cancellous bone (alveolar bone). (Figure 1)

***Figure 1:** KOS single piece dental implant*

Smooth-surfaced basal implants are available as axial and lateral implants. Axial-polished basal implants (e.g BCS) feature aggressive threads at apical area and they allow cortical engagement in the second cortical. (Figure 2)

Lateral basal implants (e.g. BOI) utilise a lateral path of insertion and they use the same bicortical engagement (in the vestibular and lingual/palatal cortical). (Figure 3)

Figure 2: *BCS single piece dental implant.*

Figure 3: *Single piece lateral basal implant.*

When using traditional dental implants a considerable group of patients are refused implant treatment either due to severe atrophy of jaws or due to compromised medical condition. Thus, those patients who would require dental implant treatment most, are left untreated.

Today "basal implantology" is well able to address and solve all the mentioned issues and provided help for the most compromised patient group. Basal implants belong to the group of osseointegrated implants. Their common features are:

- Cortical positioning of load transmitting implant areas.
- Thin and polished vertical implant parts for mucosal penetration.
- The usage of resorption stable bone areas for anchorage.
- The possibility of immediate loading.
- Macro-mechanical anchorage.
- Immediate cortical osseo-integration in the case of screwable basal implants (e.g. BCS).
- Gradual biologic osseo-integration (under immediate load conditions) in the case of lateral basal implants (e.g. BOI). Thus these implants when placed in their strategic positions can be loaded immediately and the patient can get their teeth fixed in strategic 72 hours[1].

Case report

A 72-year old osteoporotic, completely edentulous patient came to our dental clinic for replacement of missing teeth. After a thorough clinical and radiographic examination the patient was given various treatment options available and the patient willingly chose to get treated with basal implants – fixed teeth in 72 hours. Diagnostic mounting of casts and CBCT were done to plan the case. The case was planned to place basal implants in strategic positions in both the arches and rehabilitation with hybrid prosthesis. The case was performed in the following way:

DAY 1:

Local anesthesia was infiltrated at the surgical sites according to standard protocols. Implants were placed into the strategic positions to engage the cortical bone. In the upper jaw 12 BCS implants were placed flaplessly utilising all the available zone of maxilla engaging in the second corticals, using hand-grip insertion tools. In the lower jaw 8 BCS implants were placed engaging in the second corticals and base of mandible anteriorly. Impressions were made with addition silicone and the jaw relation was registered using impression wax. Then facebow was recorded and transferred to semi-adjustable articulator. The impressions and records were send to the laboratory. (Figure 4)

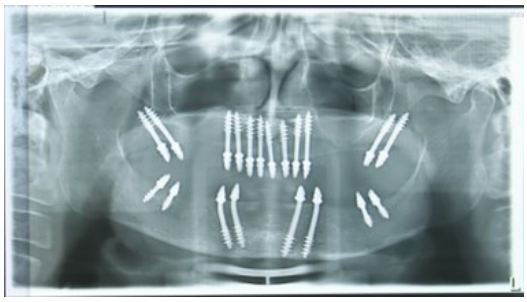

Figure 4: *OPG showing placement of basal implants in both the arches.*

DAY 2:

The laboratory fabricated metal framework for the planned hybrid prosthesis and the trial of the prosthesis was performed intraorally. Figure (5) After the successful metal try-in the definitive inter-maxillary relationship was registered using bite registration paste. Then shade selection for the teeth was done and trial was performed on the same day. Then the lab acrylized the prosthesis and send for final insertion. (Figure 6)

Figure 5: *Metal framework on master cast.*

Figure 6: *Framework trial performed intra-orally*

Day 3:

Here the case was completed with hybrid prosthesis with bilateral occlusal contacts from distal surface of the 1st premolar to the mesial half of the first molars. Thus, all contacts were strictly restricted to the 'supporting polygon', a demand which was raised and explained by Ihde & Ihde[4] for immediate functional loading in dental implantology, and which has become the standard of treatment today. The lateral occlusal interferences were eliminated, and anterior guidance was established. The prosthesis was permanently cemented with GC Fuji cement. (Figure 7)

Figure 7: *Cementation of final prosthesis.*

Discussion

Basal implants when engaged in the dense but thin cortical bone achieve high primary stability, thus allowing immediate functional loading[1]. They have to be splinted rigidly through a metal-bridge framework as soon as possible. This precaution is necessary because the bone's remodelling starts around this time, and it leads to a weakening especially of the peri implant bone structures. The splinting will assure that masticatory loads are distributed on many cortical bone areas, instead of overloading the bone around single implants. The procedure and its principles are known in traumatology[2].

The utilisation of the second cortical and the clear distinction between the first and second cortical as reliable anchorage region were described by Ihde & Ihde[4]. Remodelling takes place not only around implants but basically affects the whole operated jaw. This remodelling always follows the same pattern: activation – resorption – formation (A-R-F)[5].

Osteoclastic activity takes place first. It is then followed by mononuclear cells which lay down mineral deficient (sulphur -rich) bone matrix through osteoblasts. Thus, initial mechanical stability is replaced by biological stability after the mineralization of the matrix[6].

It takes up to two years for the remodelling (including the mineralization) to be completed. Cross-arch stabilization through a circular bridge allows enough micro motion for the patient with regard to masticatory function but not enough to prohibit osseointegration. Better results of extraction and basal implant placement are achieved in the same surgical step, compared to delayed implant placement: better stability, less remodeling. When doing immediate functional loading, enough implants in secure cortical contact must be placed.

Over many years of usage, we have experienced the advantages of the basal implant approach:

- Immediate functional loading as stable anchorage achieved by cortical engagement.
- Isoelastic design – respects functional flexion of maxillary and mandibular bone and allows the placement of circular bridges in both jaws.
- Smooth implant surfaces and thin necks prevent peri-implantitis.
- No alveolar bone is required for implant anchorage; thus all patients may be treated.
- Prosthetic relation to crestal alveolar bone remains unchanged.
- Immediate placement in periodontally involved socket is possible.
- Non-traumatic one-step surgical procedure[1].

All this results in a severe reduction in treatment time and costs and therefore high patient acceptance.

Conclusion

Basal implantology offers straightforward treatment results and avoids long waiting period and the shortfalls, which are seen in conventional implants. The fully informed patient will therefore always choose this treatment option. Thus, the patient can be successfully restored in strategic 72 hours protocols with immediate functional loading of basal implants.

Conflict of interest

The author declare no conflict of interest.

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