

Role of Immediate Loading in the Success of Implants and Implant-Supported Dentures

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ABSTRACT

The treatment of tooth loss using dental implants has created a new view in dentistry. With this breakthrough, implant-supported prostheses have become a widespread and acceptable treatment option. Implantation on the alveolar bone immediately after tooth extraction is called immediate placement and immediate loading. It reduces the number of surgical operations required and shortens the time to heal, requires fewer temporary restorations, reduces potential costs and, last but not least, helps the patient to have a better experience both aesthetically and functionally. These advantages have caused an increase in its usage since its initial debut. With the correct choice of patients, sufficient application of surgical procedures, and properly done prosthetic restorations, the patient can be subject to immediate or early loading without compromising on aesthetics and functionality.

Keywords: Immediate loading, immediate implantation, loading protocol, dental implants

INTRODUCTION

Modern dentistry has witnessed a rapid and consistent evolution. The concept of success in dental implant-supported prostheses has gained more aesthetic value over time.¹ Nowadays, in implant-supported prostheses, it is expected that the prosthesis is not perceived during the patient's smile. Treatment protocols have been redefined in accordance with patients' expectations, such as increased comfort, aesthetics, and shorter treatment duration.²

Rehabilitation of partially and totally edentulous patients with implant-supported restorations has become a standardized and predictable treatment that results in high survival and success rates for both implants and restoration.³ These predictable clinical outcomes are based on obtaining a direct interface between the implant surface and the alveolar bone (osseointegration) during healing after implant placement. Successful immediate loading must allow bone regeneration while continuously supporting the loads at the bone-implant interface for the

long-term survival of mechanical fixation while osseointegration occurs, even if active and passive loads are transmitted by the implant to the bone interface. The faster the bone adapts to the surface, the shorter the period of risk resulting from normal functional loads during healing is.⁴

Since Branemark⁵ introduced the osseointegration system in 1977 to the present day, new protocols on prosthetic load timing up to immediate implant loading have been proposed for osseointegrated implants in the treatment of edentulous jaws. Classical protocols recommend that implants not receive any loading during the osseointegration period, usually 3 to 4 months in the mandible and 6 to 8 months in the maxilla.⁶ Updated protocols have shortened the post-extraction healing period, and thus, implants could be loaded earlier or even immediately before osseointegration was completely obtained.⁷

Clinical results in many systematic reviews report that it is not necessary to keep implants under the mucosa without being exposed to functional loads for osseointegration in current dental implant applications. Despite those who

argue that immediate loading is a risk factor for implant success, immediate loading or early loading increases its popularity every day due to its contribution to gingival aesthetics and shortening of waiting time, as well as providing psycho-social advantages to the patient,⁸ and the success rate is similar to other loading approaches in case of primary stabilization, appropriate restoration, and bone selection. With immediate full arch loading, edentulous patients do not need to use conventional removable dentures during the period from osseointegration to the end of the prosthesis (2 to 4 months). Furthermore, an improvement in both comfort and function is ensured during the implant healing period.⁷

Success in implant-supported dentures is directly associated with the concept of osseointegration, and prosthetic options are highly important in this success or failure. The terms immediate loading and placement are frequently confused. Immediate placement indicates the timing of implant operation after tooth extraction, and the timing is in 3 ways.

- **Immediate implant:** Placement of the implant within 1 day after tooth extraction or at the time of extraction.
- **Early implant:** Placement of the implant within 6-8 weeks after tooth extraction.
- **Conventional/late implant:** Placement of the implant 3 months or more after extraction.⁹

Loading/restoration time defines the timing of the prosthesis on the implant. For the indication of immediate placement, many studies in the literature suggest the following criteria: good general health, edentulous site or teeth with poor prognosis, sufficient bone quality and quantity, absence of acute infection, and primary stability of implants.¹⁰ The criteria for contraindication are insufficient bone volume, severe maxillo-mandibular skeletal discrepancy, drug and alcohol use, excessive smoking, local radiotherapy in the head and neck region for malignancies, immunosuppressed condition including antineoplastic chemotherapy, severe chronic kidney or liver disease, uncontrolled diabetes, stroke, HIV infection, pregnancy at the time of assessment, hemophilia, bleeding disorders or coumarin therapy, metabolic disorders, poor oral hygiene, mucosal disease such as lichen planus, acute infection of the implant site, extraction residues, chronic bone disease, bruxism and general contraindications for surgical procedures, and noncooperation of the patient.²

Esposito et al¹¹ described 3 protocols for the timing of implant loading:

1. Immediate loading implants (ILI) within 1 week after implant placement. Two types of immediate loading have been described in the literature.

Immediate functional loading, which refers to the use of a temporary or definitive prosthesis placed on the same day as the surgery in occlusal contact with the opposing arch (IFL)¹²

Alternatively, immediate nonfunctional loading (INFL) involves modifying the immediate temporary restoration, which includes avoiding occlusal contacts in central and lateral movements to reduce the risks of mechanical overload caused by functional and parafunctional movements.¹³

2. Early loading implants (ELI) between the first week and 2 months.
3. Conventional loading implants (CLI) 2 months after implant placement.

Two subclassifications point to different loading modalities:

- A. Occlusal loading or non-occlusal loading.
- B. Direct loading or progressive loading.

Studies on ILI (immediate loading within 1 week) demonstrate that successful results can be expected when previous criteria are met, a correct indication, and correct surgical and prosthetic protocols are followed.

In the literature, the period between immediate and late loading is called "Early loading." Early loading includes loading in a 3-month period starting from the 2nd day after the surgical intervention.

In the studies, it is in the form of early functional loading with a single-stage surgery, and 2 basic designs emerge:

- (a) First, it is providing primary stabilization of the implant bodies by preparing them in a conical shape similar to the root.
- (b) The other is the avoidance of applying excessive torque at the prosthetic stage.¹⁴

It is observed that ILI poses a greater risk for implant failure compared to CLI. It involves the use of different surgical procedures, prosthesis types, loading times, and very different study designs. This lack of homogeneity limits the appropriateness of the conclusions to be made.²

The following factors should be considered when deciding on immediate loading¹⁵:

- Low bone density
- The amount of damage in the socket after extraction
- The type and amount of occlusal loading
- Smoking habit

Careful evaluation should be completed before considering immediate placement and loading.

Immediate placement and loading are very successful in the maxillary and mandibular¹⁶ anterior regions when a correct indication and correct surgical and prosthetic steps are followed. Avoiding this type of treatment is the best option when even one of the patient-related factors such as systemic disease, not paying attention to oral hygiene, smoking habit, presence of infection of endodontic or periodontal origin in the extraction site, lack of primary stability, and bone biotype is unfavorable. However, if this treatment is started after the conditions are made suitable, conditions such as not being able to find the sufficient bone volume in the late period and the use of membranes and grafts will be minimized for the physician. It was seen that immediate or early loading did not adversely affect osseointegration after implants were placed. However, primary stability should definitely be provided at the surgical stage in immediate or early loading.¹⁷

Patient selection criteria may affect the success of this technique while performing ILI.¹⁸ In studies on ILI, successful outcomes can be expected if previous criteria are fulfilled. It seems that ILI has a greater risk of implant failure, although survival rates are higher for both procedures compared to CLI.¹⁹

According to different authors,²⁰ the ILI protocol more frequently leads to technical complications. The most common of them are prosthesis fractures, loosening of abutment screws, and prosthetic contour adjustments. Finally, it can be explained that gingival opening is formed around the abutments after secondary healing in immediately loaded prostheses. However, in conventionally loaded implants, the opening does not occur in the gingiva since there is no pressure after the healing period.²¹ All of the above-mentioned variables together are crucial for reducing the risk of peri-implantitis.²²

The data in the literature have revealed that ILI can represent a safe and effective protocol to rehabilitate single or multiple missing teeth and offers significant advantages in terms of function, aesthetics, and comfort for the patient.² In addition to biological gains, these practices are also psychologically advantageous for patients due to the shortening of the treatment period.²³ Moreover, the clinical success of this technique is significantly affected by patient selection, bone quality and quantity, primary stability, number and design of implants, occlusal loading, and the clinician's surgical ability.

Implant primary stability is undoubtedly the most important among them. Studies on ILI also show that successful results can be expected if previous criteria are met.² The implant placement torque value is the decisive and most accessible parameter to evaluate primary stability.

Therefore, it is important to evaluate the bone density at the implant site to obtain the required torque in order to perform immediate loading. Computed tomography (CT) has been regarded as the best radiographic method to evaluate residual bone.²⁴

The importance of occlusion, as well as the loading period, in the prosthetic success of implants is indisputable. In patients treated with a single implant in the anterior region in immediate loading, centric occlusion, lateral, and protrusive movement should be such that there is no contact with the antagonist teeth, and in the pre-molar region, canine-shaped preparation is recommended instead of premolars by modifying the teeth.²⁵

Occlusal Adjustment

- (a) Quantity and quality of force: immediate or early loading should be avoided if the patient has a parafunctional habit since horizontal and oblique forces will initially have a negative effect on bone healing.
- (b) Prosthesis design: If cross-arch stabilization is performed on jaws with multiple implants in immediate loading, occlusal loads will be evenly distributed. Furthermore, in cases with immediate or early loading, occlusion should be established by removing premature contacts.

The meta-analysis by Chrcanovic et al²⁶ indicated that differences in occlusal loading between INFL and IFL might not affect the survival of dental implants and there was no statistically significant difference between the 2 techniques regarding marginal bone loss.

A Cochrane systematic review¹⁸ concluded that there was no convincing evidence regarding a clinically significant difference in prosthetic failure, implant failure, or bone loss associated with different loading times of implants.

Recent studies have investigated the potential effects of occlusion on immediate temporary restorations. It has been repeatedly indicated that occlusal forces should be controlled for successful immediate loading.²⁷ A comprehensive systematic review and meta-analysis could not reach a definite statement on occlusal contacts in the osseointegration of dental implants.¹¹ Another review showing disagreement about occlusal contacts in immediate loading proposed only a centric contact concept.¹¹ A randomized clinical trial with 100 immediately loaded implants in complete occlusion or mild infraocclusion found no significant difference in survival rates, bone loss, or soft tissue parameters.²⁸ Furthermore, occlusion may not be the only determinant of implant survival.²⁹ Immediate loading in implant-placed sites is complex (Figure 1).

Nonfunctional immediate loading protocols were introduced to protect newly placed implants from exposure to

excessive functional or parafunctional forces in partially edentulous patients.³⁰ It was suspected that complications such as bruxism and severe clenching increased the risk of failure among immediately loaded implants.³¹ Studies have reported lower implant survival rates after immediate functional loading, both in the immediate nonfunctional restoration and after delayed loading.³² In other studies, no difference was found between immediate functional and nonfunctional loading in terms of implant survival, bone loss, or soft tissue healing.³³

Except for primary stability and type of occlusion, other parameters such as the size and number of implants, macro and microstructures of the design, and bone quality should also be taken into account.³⁴ The use of long and large-diameter implants is known to provide advantages in loading due to the increase in surface area. Grooves are used in the macro design of implants, and surface treatments such as sandblasting, pickling, and roughening are performed in micro design, in other words, in terms of implant surface properties. Immediate and early loadings are more favorable because primary stability will be better in implants placed when the bone quality is type I or II.³⁵

The long-term outcomes of implant-supported overdenture prostheses are significantly influenced by the longevity and functionality of the underlying implants, and osseointegration is considered the most important determinant of implant success.³⁰ Furthermore, along with numerous studies on intraosseous implant materials and implant surface modification techniques in the last 2 decades, predictable osseointegration could be achieved with clearly reduced healing time.³⁶ More importantly, optimized implant geometry designs and improved surgical techniques significantly increased the initial stability of dental implants.² Hence, the necessity of a long healing period was questioned, and it was indicated that there was a need to change the loading protocol to meet the increasing aesthetic and functional demands of patients.³⁷

In the animal study by Nkenke et al.³⁸ early and late loading was applied in immediate implants placed in the posterior maxilla, and as a result of the evaluation by following RFA (resonance frequency analysis) Osstell measurements for

6 months, no difference was reported in terms of success when the immediate loading protocol was compared with early and late loading.

The only main rule that has not changed since the beginning of dental implantology is to keep implants immobile during the healing period. During this period, it will be impossible to immobilize implants absolutely. Therefore, we should aim to minimize the micromovement.¹⁵ Since the beginning of implant dentistry, micromovements have been considered among the main risks for the success of osseointegration.⁷

Immediate implant placement in the anterior maxilla is a very difficult treatment procedure due to aesthetic, phonetic, biomechanical, and anatomical considerations. It is also challenging to predict the facial alveolar bone thickness without appropriate radiological assistance.²⁴ The presence of a thin facial bone or an apparent root position may contribute to facial bone fenestration and separation and soft tissue regression after implant placement.³⁹

The presence of a very thin facial bone in the maxillary anterior region leads to fenestration and separation. When maxillary anteriors are observed in close proximity to the nasal cavity, 3D preliminary radiographic evaluation using CBCT is important to evaluate the anatomical parameters that may prevent implant placement.²

Regardless of the implant system used, the placement of the implant in the correct 3-dimensional position is an important factor for the aesthetic result of the implant.²⁴ The long-term stability of the implant depends on several factors, and the presence of gingival margins on the implant compatible with the adjacent tooth is one of the important factors, mainly depending on the thickness of the alveolar bone.⁴⁰

Clinical studies have not yet defined a certain implantation method for minimal crestal bone loss.⁴¹ Factors such as the timing of implant placement and loading, the number of implants, and the type of prosthesis may determine the degree of bone loss in the manufacture of removable or fixed dentures for totally edentulous patients.⁴²



Figure 1. Classification of the complexity of immediate loading in implanted sites.⁵³

According to the standard Branemark protocol in which implants are placed in an upright position in a way to obtain vertical loading forces, long cantilevers (sometimes up to 20 mm) are needed to place implants in the anterior region.⁴³ The use of long cantilevers may lead to mechanical overload of the prosthesis by causing unequally distributed forces on the screw, prosthesis, abutment, or implant, which may thus reduce the success and survival rates.⁴⁴ The length of cantilevers can be reduced by placing implants at a certain angle. The use of tilted implants may help reduce the risk of complications of lateral and vertical bone augmentation that occur in nerve lateralization and sinus lift operations.⁴⁵ Furthermore, it also provides primary stability by allowing longer implants where bone-implant contact is increased.⁴⁶

There are various reports revealing that tilted implants are equivalent to axial implants in crestal bone loss with the All-on-4 concept.⁴⁷ A report on stress distribution at 0, 17, 30, and 45 prepared by Ozan and Kurtulmuş-Yılmaz^{46,47} shows a direct relationship between stress relief and tilt angle.

The idea behind the concept of keeping the temporary restoration out of occlusion with regard to implant failure rates is to control the load on the prosthesis to allow uninterrupted healing.⁴⁸ The criteria proposed by Albrektsson et al⁴⁸ for implant success are as follows:

1. Subjective Criteria

- Sufficient function
- Increase in aesthetics
- Lack of discomfort
- Emotional and psychological recovery of the patient

2. Objective Criteria

- Vertical loss of bone not exceeding 1/3
- Treatable gingival infections
- Adequate vertical size and occlusion
- Implant mobility should be a maximum of 1 mm
- Treatable gingival infections
- Absence of infection
- Adjacent teeth should not be damaged
- Maxillary sinus, nasal floor, or mandibular canal should not be affected, and the absence of paresthesia
- Healthy collagen tissues
- Providing 75% of functional use in 5 years,

Single-tooth implants pose a greater risk of failure compared to immediately loaded full-arch restorations.⁴⁹ It involves the use of different surgical procedures, prosthesis types, loading times, and very different study designs. This lack of homogeneity limits the appropriateness of the conclusions to be made.³

In 2000, the American Academy of Periodontology listed the general success criteria in the following way⁵⁰:

1. No signs or symptoms such as pain, infection, neuropathy, paresthesia, or violation of vital structures.
2. There should be no mobility in the implant.
3. There should be no progressive peri-implant radiolucency.
4. Negligible bone loss (less than 0.2 mm per year) following remodeling at the end of the first year.
5. Restoration should please the physician and the patient.

El Askary et al⁵¹ defined failure in implants as a situation when they cannot function (functionally, aesthetically, and phonetically) due to mechanical or biological reasons. They defined the failure criteria as follows.

1. Screw loosening in the abutment
2. Screw breakage in the abutment
3. Bleeding and hyperplasia of the gums
4. Inflammatory exudate from periodontal pockets
5. Pain
6. Fractures in prosthetic parts
7. Apparent angular bone loss on the radiograph
8. Prolonged infection and soft tissue loss following the surgical procedure

The survival of implants in the mouth is defined as having function in the bone, regardless of any complications. Although it adversely affects the patient's health and oral function, it is indicated that the survival rate in the mouth is not a clinically useful definition since the implant is not considered to be unsuccessful.⁵²

Immediate implant placement and immediate loading protocol can be quite successful when accurate diagnosis and accurate surgical and prosthetic protocols are followed.⁵² After immediate loading, a temporary prosthesis can be prepared, and permanent prostheses can be made after the healing of oral tissues (Figure 2).

The order of security of the sites for success in immediate loading is as follows:

Total mandible > partial mandible > single missing tooth > maxilla.⁵⁴

Temporary Use of Mini-Implants for Temporary Restoration

Mini-implants can be used as transitional implants to support the prosthesis during the healing phase of implant prosthetic restoration.⁴⁵ There are temporary implant systems produced for this purpose on the market. These mini-implants are placed between permanent implants, and immediate loading is performed (Figure 3). Mini-implants are removed after the healing period of original implants is completed.

The effects of single-tooth implants applied to the extracted tooth socket and healed crests under early



Figure 2. Temporary prosthesis after immediate loading, prosthesis, and oral tissues after wound healing.⁵⁵

loading with temporary resin crowns were compared, and it was determined that there was a 20% risk of loss in immediate loading in implants with immediate placement.⁵⁶

Immediate Loading Complications

- a. Mechanical Complications: Breakage or loss of abutments, screws, and temporary prostheses
- b. Aesthetic Complications: Loss of papilla, gingival recession and exposure of mental edges, abutment reflection in the gingiva, over/under lip support, the poor transition from the prosthesis to the gingiva, and unnatural appearance.
- c. Functional Complications: TMJ problems, chewing difficulties, speech problems, constant tongue/cheek biting, difficulty in tongue adaptation.

Immediate implant placement and immediate restoration lead to apicalization of the gingival margins. One year after occlusal forces begin to come to the implant during healing, approximately 1.5-2 mm of bone resorption occurs, and the bone is resorbed up to the first groove of the implant, and the resulting contraction puts excessive pressure on the soft tissue and/or temporary restoration.⁵⁸

Nowadays, the immediate loading protocol including the use of immediate prostheses in appropriate indications

presented by Schnitman⁵⁹ is implemented, although it has less successful results compared to the conventional loading protocol.

The effects of the immediate protocol are as follows:

1. Immediate provision of functional and aesthetic factors
2. Elimination of second-line surgery
3. Shortening the treatment period
4. Preservation of papillary aesthetics
5. No need for temporary prostheses
6. Positive effect on the patient-physician relationship

Despite these, there are also studies showing that immediate loading causes fibrous healing.⁶⁰

In immediate loading, losses may occur due to insufficient primary stability, the transmission of micromovements to implants, and excessive occlusal loading.

Recent evaluations have demonstrated that this type of loading should be applied

- On implants with good primary stabilization,
- With a sufficient number of implants in the mandible and maxilla, and bilateral splinting,
- With temporary prosthesis applications, and
- By avoiding wing extensions.

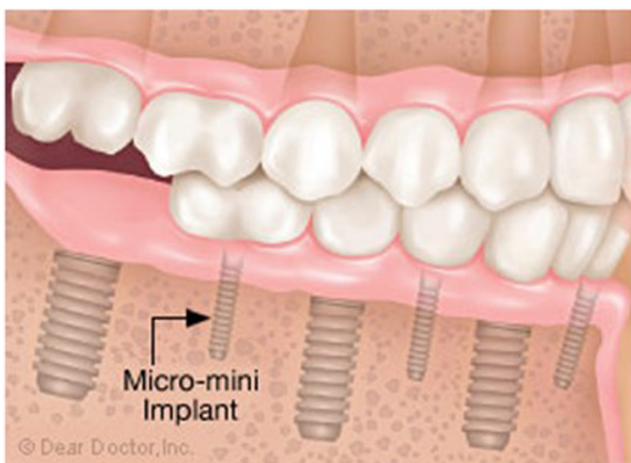


Figure 3. Micro-mini “temporary” implants providing a stable temporary bridge while permanent implants are attached to the underlying bone.

It is stated that factors such as placement of an adequate number of implants in the appropriate position, reduction of occlusal surfaces in restorations, rigid splinting and elimination of occlusal early contacts should be considered for long-term success in immediate and early loading.⁶¹ Furthermore, it is indicated that the acceptability of implant treatment for patients has increased since patients regain their aesthetic and chewing function in a short time.⁶² However, some researchers have emphasized the importance of patient selection to increase the success rate by precisely determining the clinical protocols.¹⁰ Posterior disclusion occlusion is preferred in immediate full-mouth prosthetic restorations. Thus, it is aimed to prevent contact with the posterior teeth by ensuring that the upper and lower 6 anterior teeth serve as a guide during all excursive movements.⁶³

In the case of total edentulism, there are 2 types of prosthesis options, which are implant tissue supported overdenture using 2-4 implants or implant-supported fixed prosthesis using 6-8 implants.

In a study conducted in 2010, immediately and conventionally placed fixed prostheses were compared in totally edentulous patients, and as a result of a 5-year follow-up, no difference was found between immediate loading and classical loading, and all implants were successful.⁶⁴ Immediate loading of 5-6 implants is more appropriate than 4 implants in mandibular totally edentulous patients. In immediate loading in the anterior mandible, it is necessary to pay attention to the fact that the immediate prosthesis is not winged or functional.⁶⁵ It may be necessary to increase the number of implants used for success in immediate loading in maxillary totally edentulous patients.¹⁶ After primary stabilization is evaluated by connecting 6-8 implants placed under immediate loading in the maxilla in totally edentulous patients, a balanced occlusion should be created and loaded with a temporary fixed prosthesis, and after osseointegration is completed, the permanent restoration is reconstructed approximately 3 months later using metal-supported ceramics. During the initial healing phase, it is recommended to connect implants to each other in order to increase the retention, stability, and strength of the temporary prosthesis and reduce the stress at the developing bone-implant interface. This splinting of implants increases the surface area and reduces the risk of overloading by providing force distribution.⁶⁵

In scientific studies, implant losses after immediate loading were mostly seen in the posterior maxilla. Increasing the number of implants, ensuring normal occlusion, and providing bone density and primary stabilization in the surgical procedure reduce the risk.⁶⁵ Immediate loading is very successful, especially in overdenture prostheses made on implants in the anterior region of the mandible.⁶⁶

If implants are to be loaded immediately with bar overdenture prostheses, the patient should be advised to remove the prosthesis, especially at night, and avoid hard foods in feeding, thus, bruxism and the resulting overload will be prevented. After healing, the overdenture should be reconstructed or supported.¹⁶

Immediate loading in the mandible is a safe treatment option for overdenture prostheses in the presence of standard-size implants and successful primary stabilization.⁶⁵

In cases with a single missing tooth, the most important reason for immediate loading is to provide aesthetics. If the implant is to be placed and immediately loaded after tooth extraction, the bone quality should be good

in this site, and there should be no periodontal/periapical infection.⁷

Immediate loading can be done in partially edentulous patients, these patients usually have a sufficient number of natural teeth in function, and immediate restoration should be done first if there are aesthetic requirements. Restoration should also be excluded from occlusion. Misch calls this process "nonfunctional immediate restoration".⁶⁷

In partial fixed restorations, it is indicated that the first purpose in immediate loading for the posterior region is to start loading from the premolars and that implants in the molar region can be kept out of function until the permanent prosthesis. It is recommended to create maximum intercuspation in the final prosthesis.¹⁵

It is stated that it is necessary to prevent the antecedent contacts and conflicts with the opposing teeth while creating occlusion, and that anterior disocclusion should be provided regardless of the type of loading, especially if there are cantilever extensions in metal-supported ceramic bridges.¹⁵

It has been revealed that maximum intercuspation is first created, and then favorable occlusion can be created by removing the marked areas identified in both lateral and protrusive movements. It has been stated that prosthetic failures can be prevented this way.¹⁵

Four factors¹⁵ are underlined in the preparation of occlusion while placing the implant:

1. Tubercle Positions: While positioning tubercles for over-implant restorations, it has been suggested that tubercles other than the upper palatal and lower buccal tubercles should not be actively involved in occlusion.
2. Fossa Depth: It is indicated that a sufficient depth should be provided in the fossa corresponding to the active tubercles in centric occlusion to activate chewing.
3. Appropriate Anterior Disocclusion: It is reported that the selected areas in anterior group teeth should be created in a way that provides the most ideal function and aesthetics in order to prepare a good physiological guide in the lateral and protrusive direction.
4. Creating escape grooves: It is emphasized that it is necessary to create escape grooves that start from the fossa and show the path to be followed by the active tubercles in lateral and protrusive movements²⁵

In the data on loading protocols, better aesthetic results are obtained with immediate and early loading compared to conventional loading, and patient satisfaction also increases. However, every case should be evaluated in terms of scientific and clinical risks, and conventional

methods should be preferred in cases where immediate loading would be risky.

According to clinical observations and studies, the points to be considered while deciding on immediate loading can be summarized as follows:

1. While performing immediate loading in total edentulism, at least 5 implants in the mandible and 8 implants in the maxilla should be optimally distributed and planned in such a way that they create a bilateral splinting effect.
2. Implants with a placement torque of at least 32 N/cm and high primary stability can be loaded.
3. The diameter and length of immediately loaded implants should be sufficient.
4. Temporary fixed prostheses should not be removed during the healing period.
5. Implants whose length and placement torque do not provide the desired values should not be loaded.
6. Wing extensions should be avoided in immediate prostheses, whether temporary or not.
7. Implants with a value of 65 ISQ and above in the RFA measurement with Osstell can be loaded immediately.

Immediate loading in implant-supported prostheses is a case-specific application. The physician should evaluate the patient's condition, decide and apply the most appropriate treatment protocol with his/her theoretical and clinical experience.

Adequate planning can be achieved using the various technologies available nowadays, and it is important to remember that any changes in any position regarding the prosthesis used during planning may endanger the final result with changes in occlusion, aesthetics, and biomechanics. A comprehensive clinical assessment will be necessary for proper planning and should include an evaluation of the smile line, gingival morphology, inter-arch relationship, condition of adjacent teeth and gingival marginal positions and supporting tissue conditions. The long-term outcomes of implant-supported overdenture prostheses are significantly influenced by the longevity and functionality of the underlying implants, and osseointegration is considered the most important determinant of implant success. It will not be possible to absolutely immobilize implants during the healing period. However, it should be our aim to minimize the "micromovement" in a way not to alter the prognosis.

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