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RETROSPECTIVE EVALUATION OF SUCCESS OF IMPLANT SUPPORTED PROSTHESIS: EARLY RESULTS

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Abstract

Introduction: The interpretation of clinical results of dental implant supported prosthesis treatment is very crucial to be able to make a comparison between different implant systems and treatment options and furthermore to benefit the experiences of the other clinicians. However, the clinical outcomes of these studies should be reported in an objective way and be independent from the system used and also be prepared in accordance with certain criteria and standards that have been accepted scientifically world-wide for being reliable and describing long-term results.
Aim: Three-hundred and eighty-two consecutive NTA implants were performed on ninety-nine patients. The implants used in 2016 and the constructed restorations were retrospectively analyzed. In addition, the effect of the experience of clinician was evaluated related with the success of the implant therapy.
Materials and Method: This retrospective study was conducted in the Department of Prosthodontics Süleyman Demirel University. Three-hundred and eighty-two consecutive NTA implants were performed on ninety-nine patients. The implants used in 2016 and the constructed restorations were retrospectively analyzed.
Results: The implants were followed for at least 2 years. In total, 239 implants were inserted. It was found in 143 mandibles. Prosthetic restorations were determined to be partial prosthetics (219), single crown (81) and overdenture prosthetics (64). During the evaluation period, 6 implants failed before prosthetic treatment, ten decementations, six retentive screw loosening and five porcelain chipping were detected.
Discussion and Conclusions: The early results of our study are consistent with the results of other studies. However, long-term follow-up is required for more accurate assessments.

Keywords: Implant; Success Evalution; İmplant Supported Prosthesis.

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1. Introduction

The use of dental implants in the rehabilitation of partial and complete edentulous patients has become a long-term treatment method that has been prescribed and accepted. (1).

In most studies that examine the success of the implant, an implant-implant and typically the integrity of the bone support and inflammation, infection around the implant site, mobility and peri-implant bone loss assessed using parameters such as the quality of Osseointegration has emphasized. Predictable results are believed that be due to controlled loading conditions, good initial implant stability and the osseo conductive implant surface (2).

The use of dental implants is considered a safe and predictable treatment procedure in tpartial and complete edentulous patients. Implant-supported treatment methods vary as winged bridge, implant-supported single crowns or implant-supported bridges (3).

Rehabilitation of the edentulous patient with severe resorption of alveolar bone is known to be a challenging treatment. Bone loss can be exacerbated by dental losses and possible infections that progress when the remaining hopeless teeth are present. The literature on toothless patients describes several treatment options: conventional movable full dentures, removable implant-supported full dentures, and implant-supported fixed section dentures. However, today, rehabilitation based on implant-supported fixed-section prosthetics is preferred to both removable complete denture and removable implant-supported dentures, as described by many authors and clinicians (4).

The introduction of new and improved restorative materials and techniques in current restorative treatment practices has greatly influenced longevity and aesthetic results. The focus of implant research is on identifying clinical success criteria and factors associated with failure (5, 6).

In missingt teeth, an implant-supported fixed prostheses with the concept of Rehabilitation be seen as a routine procedure current and implant-supported reconstructions has led to a rapid growth in the number of patients who (7, 8) However, despite high survival rates, biological and prosthetic complications can occur in fixed implant-assisted restorations (7-9). "Prosthetic complications" is a common term used for mechanical damage to the implant, implant components, and suprastructures (8). Mechanical complications, especially pre-manufactured components complications (screw or abutment loosening, screw or abutment or implant fracture) is defined as laboratory and technical materials produced by the supratructure or complications (loss of retention, ceramic/veneer fractures) is defined as (10). Recent systematic reviews, clinical studies with follow up of 5 years, based on information about different implant-[SCS] [FFAs] (fixed) full arc-supported restorations, [SOP] single crowns and fixed partial dentures prosthetic complications reported good survival rates (5-8, 11). Among these, mechanical complications such as abutment screw loosening are the most common problem, especially in single tooth restorations in posterior regions where the mechanical load is higher (6, 9, 12). Although abutment screw loosening does not cause implant loss, maintenance and repair can be difficult (12, 13). The Abutment screw fracture and ceramic / veneer fracture represent significant complications leading to additional costs during the follow-up period (13).

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Reporting the" uncomplicated " survival rate of prosthetic restorations is an accepted way of identifying susceptibility to complications; this success index shows that a restoration is free of both biological and prosthetic problems.(14).

Prosthetic complications and implant failures of implant supported fixed and removable dentures were evaluated retrospectively. Also, the contribution of physician experience to clinical success will be evaluated.

2. Materials and Methods

Two team were created for the implant therapy. One dental surgeon and one prosthodontist were included in one team. The teams were unavare of the patients and the indications of the implant terapy of the other team. Also, patients were randomly distributed between teams.

The implants were applied by the dental surgeon and the implant retained prostheses were constructed by the prosthodontist after the healing process. No implant were immediate or early loaded. All the implant surgery and the prosthetic treatment procedures were conducted under standart implant therapy protocole.

Medical records for all patients who had been seen since 2016 were reviewed, and those patients who receiving dental implants were used for the study. Data collected from patients ' lists included the history and description of oral surgeries, other medical problems and medications taken, stability of the implant during surgery, bone graft type and material, whether antibiotics were given prophylactically and what type.

The study group consisted of 99 patients (49 women, 50 men) with 382 NTA implants (SLA surface) in all routine recalls for 24 months after installation. The number of dental implants used as abutments in removable and fixed removable dentures was 76 and 312, respectively. A total of 382 implants (38 single crown, 64 fixed partial prosthesis, 16 full-arch rehabilitation, 35 overdentures) in 99 patients were evaluated in 2 years. Fourty-nine patients were female, fifty patients were male. The mean age for all subjects was 61±12 years at the time of the first follow-up visit. 169 of the implants were placed by experienced team. 213 of the implants were placed by young team. Thirteen of single crown, twenty-six of fixed partial prosthesis, fifteen of overdentures, eight of full arch rehabilitation are made by experienced team. Twenty-five of single crown, thirty-eight of fixed partial prosthesis, twenty of overdentures, eight of full arch rehabilitation are made by young team.

3. Clinical and Radiographic Examination

This retrospective study was conducted in the Department of Prosthodontics, Süleyman Demirel University. The study was carried out with 4 clinician by radiographic and clinical examination of patients with dental implants at follow-up visits based on survival rate of dental implant according to prosthodontic function. In 99 patients, 50 were males and 49 were females with age range of >18 years to <70 years. Informed consent was obtained from all the participating individuals. Ethical approval was obtained from Institutional Ethical Committee. The criteria for being included patients with hormonal imbalance, patients with chronic liver disease in patients who

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receive immunosuppressive therapy, pregnant women, drug and alcohol addicts and patients with severe periodontal diseases were.

All patients who had at least a fixed restoration supported by one or more cement, more than a year and customized the screening of records under functional loading, as indicated by the following clinical and radiographic examination were asked to participate in the next. The clinical examination included medical and dental history, updating of caries and periodontal condition. Peri-implant conditions were evaluated with the following parameters in table 1:

Table 1: Peri-implant conditions

Presence/absence of pain (Albrektsson &Zarb 1998);
Presence/absence of suppuration/exudation/fistulae;
Clinically detectable implant mobility, tested manually using the handles of two dental mirrors (Albrektsson & Zarb 1998)

Complications the assessment of prosthetic restoration, supported storage for 2 years following the implant restoration influenced metallic frame ceramic chip/cracked, fracture with complications (the basis of relaxation, basis, broken, broken Fixture) any mechanical and technical determination (loss) included in.

In particular, prosthetic complications were minor (no treatment needed or <20 minutes. the time the chair, for example, a loosened abutment re-positioning, re-cementation, polishing, chipped-off porcelain) or Major (>60 min Chair time and additional laboratory costs, e.g. New Restorations, New abutments) complications.

4. Statistical Analysis

Data including prosthetic complications and implant loss were recorded and statistically analyzed using Chi-square, Fisher's Exact Chi-Square and Mc Nemars ($p<0.05$). Descriptive and quantitative data were recorded in an individual chart for statistical analysis. Descriptive statistics were made. Mean, standard deviation, median and confidence interval (95%) were calculated for quantitative variables for evaluation of radiographic bone level parameters. The cumulative implant survival rate and cumulative “uncomplicated” survival rate of fixed implant-assisted restorations, defined as uneventful (uncomplicated) survival, were analyzed as a function of time using the Kaplan-Meier survival estimator (Kaplan & Meier 1958). The cumulative “uncomplicated” survival rate of Implant-assisted restorations was estimated by a restoration-based analysis (at the restoration level).

5. Results

A total of 382 implants (38 single crown, 64 fixed partial prosthesis, 16 full-arch rehabilitation, 35 overdentures) in 99 patients were evaluated in 2 years. Fourty-nine patients were female, fifty patients were male. The mean age for all subjects was 61±12 years at the time of the first follow-up visit. 169 of the implants were placed by experienced team. 213 of the implants were placed by young team. Thirteen of single crown, twenty-six of fixed partial prosthesis, fifteen of overdentures, eight of full arch rehabilitation are made by experienced team. Twenty-five of single

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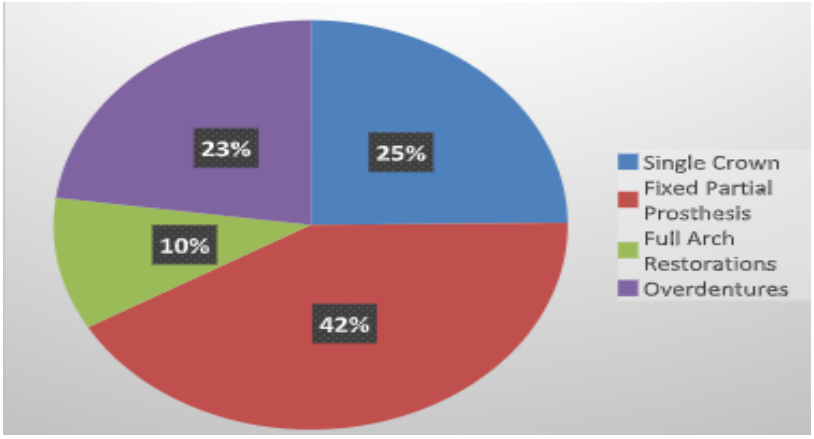
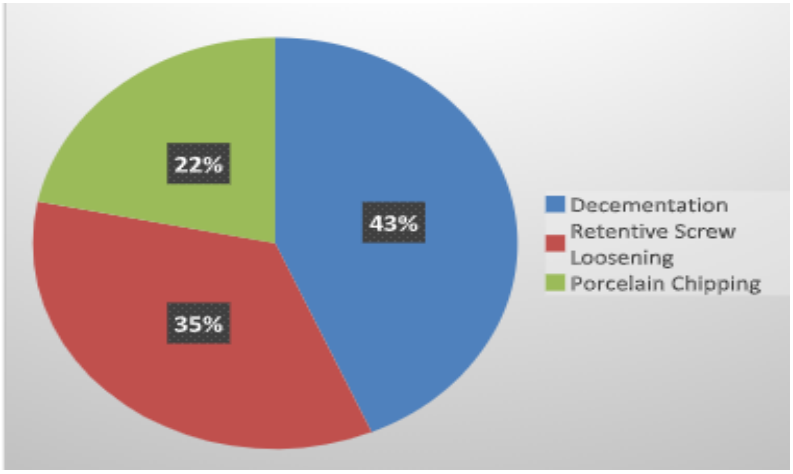
crown, thirty-eight of fixed partial prosthesis, twenty of overdentures, eight of full arch rehabilitation are made by young team.



Graphic 1: Implant Supported Prosthesis Types

The implants were followed up at least 2 years. 239 implants were placed in the maxilla and 143 were in the mandible. The prosthetic restorations were fixed partial denture (100), single crown (38) and overdenture prosthesis (35). Within the evaluation period, 4 implants failed before prosthetic treatment, ten decementation, six retentive screw loosening and five porcelain chipping were determined among all prosthetic restorations (Graphic 2). The most frequent complications were screw loosening in fixed and the need for relining in removable dentures. No signs of periimplantitis were detected.



Graphic 2: Comparison of prosthesis complications

6. Discussion

Comparative analysis of three different designs, including implant-supported single crowns, implant supported fixed partial prosthesis and tooth-implant-supported prosthesis were performed. Prospective and retrospective cohort studies that fit the criteria for inclusion in this meta-analysis were evaluated to summarize data on survival and failure rates of implant-assisted prostheses 5

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years and older. In this study, the evaluation period is considered to be 5 years, but according to some researchers, this period is stated to be too short to gather the necessary information. However, dental implants have been used for reconstruction for many years (15).

The study found that problem rates were higher for implant-assisted FPDS (0.881 per 100 FPD per year) and combined dental implant-assisted FPDS (1,514 per 100 FPD per year). Fixed partial prosthesis with combined dental implant support were found to have the highest annual failure rate (1,514). The difference in failure rates was observed to be statistically significant. This result was reported by pjeturson et al. it was contrary to previous studies reported by. (6). This can be attributed to better designs and treatment protocols introduced in recent years. The highest failure rates were seen compared to combined dental implant-assisted FPDS. This result has been reported earlier in the literature.

In this retrospective study, implant survival rate of 100%, while it is gradually reduced over time determined using both the CSR classification, the peri-implant-like peri-implant infectious disease prevalence means that even in the absence of the important physiological changes took place.

Patzelt et al. (4) reported similar results with data reported on the same treatment strategy evaluated in this study. A total of 13 studies were included in the study, and the reported implant survival rate for maxillary restorations ranged from 97.2% to 100% at 12 months, which has been reported in multiple studies (16-22). In 35 of the studies we examined, the second most commonly reported complication associated with SIRs was a coating ceramic or crown fracture. This complication occurred over an average of 5 years in 172 (3.4%) of 5052 ceramic and metal-ceramic restorations (23, 24). Twenty-nine studies have reported this complication in ceramic or metal-ceramic restoration by dividing it into groups. The incidence of complications was reported as being higher in ceramic restorations (8.3%; 62 of 746 restorations) than in metal-ceramic restorations (2.3%; 64 of 2759 restorations) (24-26). In 19 studies reporting for anterior and posterior SIRs separately, the incidence of ceramic fracture complication was assessed at 3.1% (82 of 2634 restoration) for posterior SIRs and 1.7% (7 of 421 restoration) for anterior SIRs. (24, 26).

In our study,we reported that the incidence of the complication (porcelain chipping) %3,6 (5 of 138) .The outcomes of study was compatiblr with these studies.

It is recommended to reduce the size of the occlusal table to reduce the incidence of cladding ceramics or crown fracture, to create shallow pinnacle height, to alleviate occlusal contacts, and to provide uniform thickness and proper support for cladding ceramics. Decementation was reported many studies (24, 27, 28). Of the 2394 restorations, 159 were displaced for an average incidence of this complication of 6.1% over 5.2 years. Incidence of decementation may be negligible when Glass ionomer or resin cements are used (29)**.**

Incidence of complication (decementation) 7.2% (10 of 138). The results of the study were consistent with these studies. We recommend using resin-reinforced cement to reduce the chance of decementation.

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Abutment or coronal fixture fracture was noticed to occur for an average of 4.4 years (incidence, 0.5%) in 25 of the 3695 restorations (30, 31). Many studies have reported that the frequency of fracture of the abutment screw is 0.3% (7 out of 2185 restorations) (32-34).

Six categories of technical or mechanical complications were reported: (1) fracture of framework, (2) fracture of screws, (3) loosening of screws (4), decementation (5) chipping or fracture of veneering material and (6) fracture of abutment. A study evaluating all complications at the same time has not yet been carried out. Data on mechanical and technical complications were noticed by category and combined data from 29 studies.

The 29 studies reported a overall 2998 PFISPs, 482 (16.1%) of which were associated with technical or mechanical complications over a mean of 5.4 years (35, 36).

The most frequently reported complication was chipping or fracturing of veneering material, which was observed in 251 PFISPs (8%). The second most frequently reported complication was screw loosening, which occurred in 151 PFISPs (5%). The design of the implant connection substantially affected the incidence of technical or mechanical complications (26,37-40). The incidence of the complication (screw loosening) % 2 (8 of 382) .The outcomes of study was compatible with these studies. We recommend using resin-reinforced cement to reduce the chance of decementation.

Statistical analyses show that new variables can be incorporated into the model for learning. This mechanical failure can be involved to other variables such as peak length, antagonist type, initial loading or torque value, time, crown material and overload. These variables should be related to prosthetic screw failure.

It was concluded that the presence or absence of abutment angulation difference in Implant-assisted prosthetics is directly related to prosthetic screw failure and has no significant relationship with the type of prosthesis. Given the need for control studies on samples and external factors, these results are considered extremely important. These factors should be taken into account in the prognosis of prosthetic therapy by predicting the results caused by mechanical failures.

The mastery and knowledge and skills of the physician who will perform the treatment constitute other criteria that are effective in planning. Patients are advised alternatives before starting treatment, and how much this treatment will meet the needs of the patient should be questioned.
In the study two team (prosthetic-surgical team) in the treatment of patients who were evaluated. As a result of the study, there was no statistically significant difference between the experienced team and the young team.

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