A Prospective, Randomized-Controlled Study of BIOMET 3i Tapered Implants Placed by Students in Graduate Programs

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ABSTRACT

BACKGROUND: The success rate for implants placed by dental students early in their residency programs has been suggested to be lower than for experienced clinicians. The objective of this prospective study was to document the success rates of NanoTite and Osseotite-surfacd Tapered implants in graduate training programs. MATERIALS AND METHODS: All study implants are the Certain tapered system (BIOMET 3i, Palm Beach Gardens, FL) made from titanium alloy Ti6Al4V, having an internal connection and either the Osseotite or NanoTite surface. An internet database is used to randomly assign and track the placement of implant surface groups and to also record the placement data and restorative outcomes. The study is a 15-year study of teaching models to students currently in University Periodontics, Maxillofacial Oral Surgery graduate programs in the United States. All patients qualified to receive dental implants provided informed consent to be included in this study. The specific placement techniques are those directed by the teaching staff at the individual study centers. Restorational designs and procedures are also at the discretion of the treating clinicians. RESULTS: At the time of this interim report a total of 423 patients made (mean age 57.5 ± 17.0 years) have been enrolled over a period of 29 months with a total of 453 Tapered implant placements documented in the database. Most subjects had not yet placed their first dental implant. Assessment data ranges up to 2 months during which time implant failures were declared. Failures were not clustered being distributed in 9 patients treated by 8 residents over 30 months. Surface type was evenly divided between the implant surface groups. The overall cumulative survival rate for these Tapered implants is 97.8 ± 9.9% for NanoTite/Tapered and 97.7% for Osseotite Tapered. CONCLUSION: Considering that most students had never placed a dental implant, the relatively high cumulative survival rates in this study suggest that contemporaneous teaching programs are effective in training new operators in dental implantology.

BACKGROUND

This is a prospective randomized comparison of Osseotite-surfaced (control) and NanoTite-surfaced (test) Tapered implants placed in patients who needed treatment for restoration of edentulous or partially edentulous cases. The admission criteria were relatively asepsis; allowing for most patients considered of returning for follow-up evaluations. Data was gathered on the demographics, baseline dental status, osteotomy preparation, implant placement outcomes, confirmations of integration at the first impression taking visit, restorative outcomes, and annual confirmation of integration for these years. The study protocol did not require any specific intervention so that study data represents the program's and patient's standard care plans.

The study was approved by the UAB institutional review board and all patients provided informed consent. Each participant placed their own implants, allowing for the placement of at least one test and one control implant. An interim study was designed to register participants collects baseline and outcome data, randomize the placement of test and control implants, as well as gather additional information from other participants (“students”) in terms of their education history, and the number of implants they personally placed prior to the start of the study. All implants used in the study were titanium-alloy, tapered, implants (NanoTite or NanoTite/Tapered implants). Palm Beach Gardens, FL; practiced with drilled and treated patients for the tapered implant.

The Dental Implant Clinical Research Group) supports this assertion. The authors suggest that a higher proportion of implant failures occur in cases that have experienced higher bone density, are treated by graduates. The specific objective of this prospective study was to document the success rates of NanoTite and Osseotite-surfaced Tapered implants placed in several graduate training programs. Several graduate programs at major universities in the USA were recruited for participation and the multiyear project is referred to as a “Collegiate phase.” This is a report of the project at a unit of these centers.

MATERIALS AND METHODS

RESULTS

CONCLUSION

• The results of the study show a very high implant success rate and this reduces the power to determine implant surface contributions to integration success.

The number of implants placed by each participant over the course of the project ranged from 96 to a low of 5 implants and the distribution across all 17 participants is represented in Figure 2. The average number of implants placed by each Resident was 30.2 ± 26: the large standard deviation value representing this difference in implant placement rates. Implants were distributed evenly between maxillae and mandibles but most placed in posterior locations (85%) and this distribution of placement sites is illustrated in Figure 3. Implant dimension distribution (Figure 3) shows that about half are 4 mm in diameter and most lengthy between 10–15 mm. Restorative cases included single teeth restorations, and short- and long-span fixed prostheses cases. The duration of implant healing ranged from immediate to delayed loading and about 5% of all implant placement cases were implants immediate replacements of extracted teeth. A total of 7 implants (4.8%) had failures, which included 4-one Osseotite-surfaced and 3 NanoTite/Tapered implants and were distributed across 5 patients and 7 Residents.

ACKNOWLEDGEMENTS

Wound healing and animal studies have provided compelling evidence that bone crystalline orientation may improve early wound healing over an acid-etched surface. The premise of the study was to use the incidence of implant failures occurring in the earpt part of a student’s learning curve to allow different implant surface types to be observed. The results of the study show a very high implant success rate and this reduces the power to determine implant surface contributions to integration success.

This study was supported by BIOMET 3i

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