



Implantology—1992: Still More Questions Than Answers

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An editorial published in the *Journal of Oral Surgery* in 1974 entitled "Implantology: The Current State of the Art" concluded that until controlled clinical and laboratory studies provide the answers to questions regarding effectiveness and safety, it seems advisable for oral and maxillofacial surgeons to adopt a very conservative approach to the use of dental implants. Certainly, that statement is no longer true today. In the almost 20 years since that editorial was written, dental implantology has made tremendous progress. What was at one time considered an experimental procedure at best has now become an accepted part of everyday practice. Patients who once were resigned to wearing removable partial dentures can now be restored with fixed prostheses and those with full dentures not only can have more stable prostheses as a result of implants, but they too can elect to have a fixed restoration.

A number of factors have contributed to the more successful use of dental implants. First and foremost, improved principles of placement and restoration have been established. A greater understanding of biomechanics and biocompatibility has also led to better implant design and acceptability. Instrumentation too has been improved, with specially designed low-speed, high-torque handpieces and internally irrigated drills. Finally, bone imaging has progressed to the state where computer-generated programs enable the alveolar process and adjacent structures to be precisely visualized for proper implant selection and placement. As a result of all these changes, success with dental implants continues to become more and more predictable.

Even bone deficiency, long a deterrent to the placement of implants, no longer seems to be an unqualified contraindication. Ingenious surgeons have devised numerous methods for alveolar restoration, and patients who were once considered untreatable because of inadequate bone are now being reconstructed with sinus lifts and implant-containing bone grafts; even those with deficiencies resulting from ablative jaw surgery are being restored to satisfactory dental function. It would thus appear that most of the potential problems with dental implants have now been resolved.

This, however, is far from the truth. One only needs to look at the variety of implants currently on the market to see that the question of the ideal implant material and design is still an unresolved issue. There are currently various screw types, root forms, hollow cylinders, and blades, each with individual differences, all being promoted as best. There are pure titanium implants and those made from titanium alloy. There are metal surface variations and there are hydroxyapatite coatings, all of

which are supposed to produce better osseointegration or biointegration. There are even claims that fibrointegration is a desirable end result. And these areas of conflict do not even take into consideration the differences in opinion about what is best in terms of abutments, attachments, and other aspects of the restorative scheme.

Despite the many new techniques currently being suggested for replacement of lost alveolar bone prior to implant insertion, this area is even less defined than the surgical and restorative aspects of implantology. The sinus lift has opened new possibilities for the use of fixed prostheses in a previously difficult area, but the findings are still preliminary, and not only are the long-term results unknown, but also the appropriate material to use, whether or not to place implants simultaneously with the graft, and, if not, the ideal time to place the implants still remain to be determined. Similar questions can also be raised regarding augmentation of the alveolar ridge with onlay grafts. As noted in 1974, this is another example of clinicians sometimes forging ahead without a sufficient amount of experimental data to adequately establish the potential of a procedure.

These criticisms are not intended to imply that we have not made the significant advancements in the field of implantology during the past two decades. To the contrary, the progress has been beyond all expectations. But they do mean that we have only begun to explore the full potential of the field, and that there is still much more to be learned before we can truly say with assuredness what is really best for the patient. As stated in 1974, these answers will only come as we continue to involve ourselves in meaningful programs of basic and clinical research.