

Revolution to Evolution and Back Again

How many times in your career have you heard a new idea described as being revolutionary? Are you ever disappointed when you embrace the revolutionary concept only to find that there was nothing life altering at the end of the process? Maybe disappointment occurs in response to the way that we use the term “revolution.”

We think of revolutions in many different ways. Revolutions are described in the world of politics, economics, social events, and even in science. Indeed, although evolution is the primary process by which complex organisms are thought to have developed, there certainly are many authors and scientists who espouse the notion of cataclysmic events causing environmental changes that ultimately result in rapid changes within the animal kingdom in contrast to the consistent relentless process of evolution.

From a societal standpoint, we hear many comments about revolution. A Google search of the term reveals almost 11 million hits. And yet, the statement has been made that the “revolution will not be televised.”¹ I agree; it is unlikely that “revolution” ever will be documented in mass media before our eyes. Instead, what we have seen in the past and are likely to see in the future is the reaction to revolutionary change. In a social sense, this is usually an evolution of thought brought about by dramatic events that were unanticipated. The revolution may be discussed in retrospect because during the moments that revolutionary change takes place, the parties involved may be so busy as to not recognize the long-term repercussions of the revolutionary events.

Revolution has occurred in dentistry. We have seen it in implant dentistry, but our ability to recognize it, to make use of it, has been more of an evolutionary process. When that group of investigators in the 1950s “discovered” osseointegration, this discovery had not been their intention. Their goal was to assess bone healing. Osseointegration, that apparent union between living bone and a biocompatible alloplastic device, was a serendipitous event that was recognized when an optical chamber could not be easily separated from the bone into which it was embedded. This serendipity represents the revolution of osseointegration. The gradual acceptance of this concept as a predictable approach to achieve bone anchorage for dental prostheses in patients who have lost their teeth represents an evolutionary process.

The clinical applications that have been developed to make use of osseointegration continue to evolve over time. In the early days, it was a matter of placing implants where there was available bone. This was followed by an appreciation that favorable results could be achieved if bone could be regenerated to allow more ideal placement of an implant that would be used to support a prosthesis that mimics nature. Improved understanding of healing following tooth extraction has led to methods to preserve the contours of the residual ridge when natural teeth are removed. Today, we are seeing combinations of interventions to recreate lost anatomy to allow implants to function as natural replacements. Circling back to the early descriptions of implant use, the engagement of existing bone through alteration in

implant dimensions or in implant angulation has generated renewed enthusiasm. Further, through provision of more affordable restorations to patients who have experienced the disability associated with tooth loss, a number of treatment approaches have been developed to combine a minimum number of implants of favorable design, surface, and dimension placed in available bone without grafting procedures.

The developing discipline of implant dentistry has benefited from the incorporation of technological advances. Three-dimensional imaging has certainly allowed clinicians to better appreciate the anatomy into which a dental implant may be placed. That same three-dimensional imaging has allowed the creation of surgical guides that improve the accuracy of implant placement. The ability to place an implant where you want it to be through the use of a restrictive surgical guide has come at a price, however. That price is reflected in the additional expenses associated with the creation of the surgical guide. Constant reassessment of the benefits of improved accuracy must be compared with the ultimate increase in cost. Simultaneously, it should be recognized that technology, as it improves, consistently drives the cost of treatment down. Surgical guides that added dramatically to the cost of treatment just a few years ago are now being created by three-dimensional printing technology that could soon be available in many dental offices at an affordable cost. Indeed, the evolution of technology in dentistry has worked hand-in-hand with the development of predictable and reliable implant treatment.

One may suggest that some of the current approaches represent a return to the early days of implant dentistry. Perhaps another way to look at this is to consider that we encounter an ever-expanding, perhaps evolutionary, knowledge base. With expanding knowledge, clinicians are better able to identify the most appropriate treatment for an individual rather than simply accepting the revolutionary concept of bone-to-implant contact as the endpoint of investigation.

The circle of knowledge is likely to continue to expand. As it does, clinicians should be aware that another revolution is always possible. In a number of editorials, I have tried to identify that next revolutionary concept as the one in which natural teeth are regenerated. That revolution will occur; of that I have no doubt. The question today is whether that is the next revolution or if there are some additional, unforeseen, revolutions that will occur before natural tooth regeneration becomes the order of the day. The other thing that is certain is that these revolutions will also not be televised.

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REFERENCES

1. Scott-Heron G. The revolution will not be televised. From: Small Talk at 125th and Lenox. Flying Dutchman/RCA, recorded 1970.