

# An Evidence-Based Concept of Implant Dentistry

## Utilization of Short and Narrow Platform Implants



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### INTRODUCTION

Implant dentistry has truly revolutionized the practice of dentistry, giving us an incredible tool to help the millions of patients who are missing one or many teeth. With great power comes great responsibility, and placing implants is a big responsibility. Choosing the proper implant, the choice of surgical techniques, and the correct restorative procedure, could make the difference between many years of successful function or an early failure. Additionally, independently of final outcome, the above mentioned decisions can make tooth replacement using implant dentistry a happy and satisfactory experience for our patients, or a nightmarish experience with multiple surgeries and a very high cost. Recently I received an e-mail from Dr. Don DiGiulian in response to one of my recently published articles, in which he expressed a sentiment shared by many clinicians: "In my area of the country, North Carolina, virtually all the periodontists and oral surgeons graft every case. I see fewer and fewer people accepting implants because this drives up the cost."

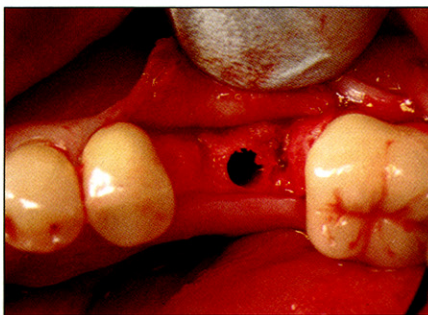
It is my opinion that we are overusing bone augmentation procedures, making implant dentistry more complicated, ex-

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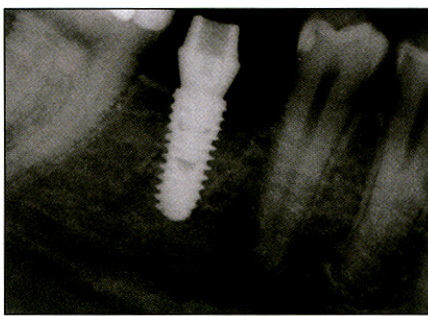
pensive, and painful for our patients. Based on our patients' needs and goals, placing smaller diameter, shorter implants in natural bone should be considered as a first alternative over a more costly and less predictable bone augmentation option. Bone augmentation is desirable and a great advancement in dentistry, when it is truly necessary. It is also my opinion that with the desire to advance the science of implant dentistry, or to satisfy our egos, we may



**Figure 1.** Radiograph showing ample bone for implant; that, combined with ridge caliper, confirms a simple implant placement.



**Figure 2.** Flap showing a wide ridge, allowing for a very simple and straightforward implant placement.



**Figure 3.** This straightforward case was diagnosed with a digital panoramic radiograph and ridge calipers. A Hiossen 4.0 x 10 implant with an immediate final prefabricated abutment was placed and allowed to heal.

have lost sight of what is important in the big picture; our obligation as healthcare professionals to provide our patients predictable treatment for replacing missing

teeth, based on good evidence and experience, in the most minimally-invasive fashion. Furthermore, we need to make it available to most of the population, not only to the rich and famous. Unlike aesthetic dentistry, tooth replacement is a necessity, not a luxury, and we must provide this service to our patients and not, for the sake of our egos, strive for the most convoluted and aggressive and often most expensive choice. In this article, we will discuss an evidence-based and "logical approach to implant dentistry," simplifying and streamlining implant dentistry, using shorter narrow-platform implants.

### WHO SHOULD BE PLACING IMPLANTS?

Referring to the fact that more nonsurgical trained dentists (other than periodontists and oral surgeons) are placing implants, Froum<sup>1</sup> writes, "...regrettably, in some cases, this has resulted in an increased rate of implant-related complications." Statements like this one would make it appear that all implant placements are better in the hands of the above-mentioned specialists. So, it might appear that patients would be better off if nonspecialists (general practitioners [GPs]) did not place implants, but is this truly best for the community? Would it be better if all root canal therapy, even the easier maxillary anterior teeth or premolars, had to be performed only by a specialist? Patients would have to wait months to get their teeth treated, the cost would increase, and, in some cases or in some areas of the country, access to care would be seriously compromised. The same is true with basic periodontal procedures, orthodontic procedures, and oral surgery procedures. Because there are many millions of patients who need implants, it benefits the population that well-trained GPs, in addition to specialists, perform simple implant surgery. In my personal experience, at least 60% to 70% of all patients needing implants surgery fall within the category of simple or "basic case" which most properly-trained GPs can han-

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### An Evidence-Based Concept...

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dle with predictability. The 2010 Academy of Osseointegration (AO) guidelines<sup>2</sup> define a simple or “straightforward case” as: “The therapeutic goal and treatment protocols are readily understood by the providing clinician. The desired tooth position is clear and surgery involves minimal anatomical risks which can be carried out without the need for significant hard- or soft-tissue grafting or modification of anatomical structures.” The level of difficulty and risk with this type implant surgery is similar to a surgical extraction, which most GPs do on a regular basis (Figures 1 to 3).

On the other hand, the other 30% to 40% of the cases fall in the category of difficult and complex cases, defined by the AO as those requiring an extensive work-up (cone beam computed tomography [CBCT], surgical stents, etc) to avoid complications or to archive the desired results; surgeries that would put us dangerously close to vital structures, cases which require bone augmentation surgery, and cases with high aesthetic demands. Cases like these should be referred to the surgical specialists (Figures 4 to 6). Bone augmentation and complex cases require a high level of expertise and skill, with much practice and experience. Because most GPs spend most of their time on restorative work and maintenance, most GPs (even when trained at some institutes) will not perform these procedures often enough to achieve the level of predictability that the surgically-trained specialists possess. My suggestion is that the properly-trained GPs should perform the simple cases and refer the challenging and complex cases to the surgically-trained specialists. The exception would be when a general dentist makes the choice to focus one’s practice on implant dentistry, seeking the appropriate training to perform the advance or complex cases with the goal of performing these procedures at a higher volume and higher skill level.

### ARE WE MAKING SIMPLE CASES COMPLEX?

As previously said, our obligation as healthcare professionals is to provide predictable treatment based on good evidence and experience, in the most minimally invasive fashion, making it more widely available to our patients. In the case of implant dentistry, we are providing a tooth replacement. It is my



Figure 4. A complex case requiring some bone regeneration.



Figure 5. A complex anterior case requiring bone augmentation and anterior aesthetic challenges.



Figure 6. Radiograph showing a complex case requiring a sinus lift.

personal opinion, based on the great number of conventions and lectures attended on the subject of implant dentistry, that the most popular and current trend is making implant dentistry more complex than it should be; often, we are turning simple cases into complex cases. Specifically, I am referring to constant focus on bone augmentation procedures advocated throughout, as well as the unnecessary and imprudent use of complex and expensive CBCT and complicated surgical stents. In order to place longer and wider implants with perfect angulations, more consistent with the normal shape/length and angulations of the natural tooth, most patients must go through bone augmentation procedures, as well as expensive CBCT and other surgical work-ups. This can in-

crease the cost, pain, and possible untoward complications. By using more bone augmentation and more naturally-shaped and angled implants, the trend assumes an increase in the success and predictability of our implants. The parameters of care declared by the American College of Prosthodontists<sup>3</sup> states, “With rapid advancements in soft tissue and bone augmentation, the placement of implants outside the normal anatomic location to support prosthodontic replacement is becoming less acceptable unless there has been informed consent by the patient for alternative implant location and angulations.”

Two important questions must be asked; first, from the scientific perspective, does the literature truly support a better success rate with the approach of more bone augmentation in order to place larger and longer implants with perfect angulations? And second, from a simple human perspective, would it be more “logical” to place shorter and narrower implants on natural bone at a lower cost, with less complications, making implant dentistry more affordable and accessible to the larger population in need?

### SHOULD CBCT REALLY BE THE STANDARD OF CARE?

Another issue making implant dentistry expensive, and thus less readily accessible, is the so-called push to make CBCT a standard of care. CBCT is a desirable and wonderful adjunctive study to increase success, allowing the clinician to visualize surgical sites with great accuracy, and to fabricate accurate surgical guides in complicated cases when close to vital structures or when multiple implants are planned. When performing a

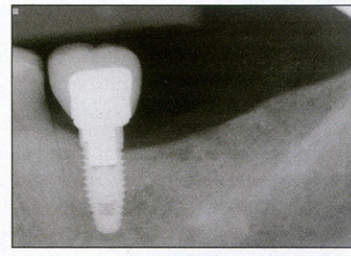


Figure 7. Six-year postoperative radiograph of a 10-mm long narrow implant in the molar region.

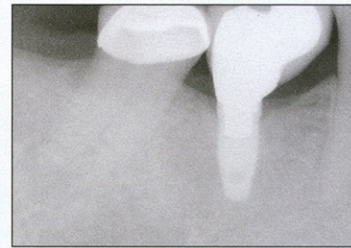


Figure 8. Seven-year postoperative view of 8.0-mm long narrow implant in the molar region.

practices, and their subsequent use and reporting on the acquired field of view, is of concern to radiologists and authorities responsible for radiation protection....” “Every CBCT examination requires justification that it will add new information to aid diagnosis.”<sup>2</sup> A common response by experts as to why CBCT should be used on every case is that, if we damage a vital structure, lawyers will undoubtedly raise the question that if CBCT had been available, would the results have been different? On the other hand, patients’ concerns about radiation continue to grow. This is due in part to recent TV shows (ie, Dr. Oz) and recent published research, making the public at large and lawyers more

### Another issue making implant dentistry expensive...is the so-called push to make CBCT a standard of care.

straightforward implant, far from vital structures and with good bone, CBCT will rarely yield information that cannot be ascertained with other less expensive or invasive tests, including the use of ridge calipers. Although newer CBCT machines have lower radiation exposure, some people take this to mean it does not have any risk, and can abuse its use. The “excessive use of CBCT is also a health concern,” expressed by 2010 AO Guidelines: “the incorporation of CBCT machines into some dental

aware of the negative effects of radiation to the head and neck. One recently published study brings concerns about conventional radiographs, stating, “Conditional logistic regression analysis, adjusted for other upper-body x-rays, showed that exposure to dental x-rays was significantly associated with an increased risk of thyroid cancer.”<sup>4,5</sup> Overuse of CBCT may, in fact, put the dental professional at risk, especially if dental professionals are quick to dismiss patients’ concerns and even some research. A more

logical and perhaps safer approach would be to use the CBCT every time we are close to a vital structure or when we are doing a complex case. On straightforward cases, when we do not plan to be close to vital structures, we can use more conventional digital radiographs or other more conventional diagnostic techniques (such as the appropriate use of ridge caliper), saving the patient money, time, and unnecessary radiation exposure. In making the decisions to best serve and protect the overall health of their patients, clinicians must be allowed to exercise their own clinical knowledge, experience, and common sense as to which care is best.

**BONE AUGMENTATION VERSUS SHORTER, NARROWER IMPLANTS: WHAT THE LITERATURE SAYS**

The first thing to put in perspective is that much of the current evidence, as reported in the literature, lacks consensus. Bone augmentation is a necessary procedure and many of my patients, who were not candidates for implant surgery because of lack of natural bone, have benefited from this procedure performed by our local oral surgeons and periodontists. However, it is important to keep in mind that, although when reading the literature on bone augmentation most authors claim an extremely high success rate, a broader view of the literature and experience shows that when implants are placed in bone-augmented sites, failure is considerably higher; 7.5% failure before loading and a staggering 11.3% during the first 5 years of function.<sup>1</sup> In addition, some of the most respected and experienced surgeons have stated with honesty that bone augmented implants are less predictable than implants placed in natural bone.<sup>6,7</sup>

On the other hand, the literature is clear in regards to the predictability and success of narrow implants between 3 mm and 4 mm (not mini-implants), which match that of regular

size implants.<sup>8-10</sup> The surgical and clinical benefits of using narrow implants include: there is more facial and lingual bone left around the implant; they allow more surgical placements

in narrow bone without bone augmentation surgery; and their use decreases the chances of surgical perforations of buccal and lingual plates, saving the patient a lot of money, time, and pain

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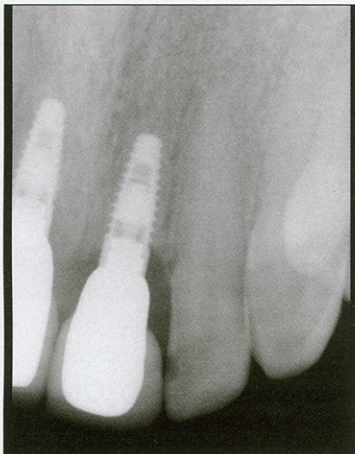
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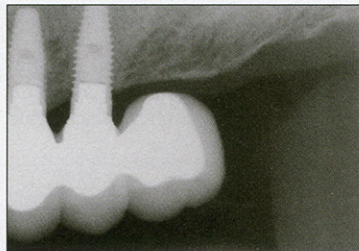
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**Figure 9.** Five-year postoperative view of 2 narrow implants used in the anterior region. The patient had been told multiple times that he had to have ridge augmentation surgery.



**Figure 10.** Eight-year postoperative view of 2 short and narrow implants, with a distal cantilever.



**Figure 11.** Two short and narrow implants in the molar region that were splinted together.

making very long implants unnecessary.<sup>13,14</sup> There is lack of consensus as to what can be defined as a short implant, as some researchers consider an implant 10 mm and larger standard, while some consider a short implant 8 mm and smaller. The evidence in the scientific literature points to good success with shorter implants (approximately 10 mm), especially when careful attention is paid to not overloading the implants<sup>11-16</sup> (Figures 9 and 10). The literature shows less predictability with very short implants (less than 7 to 8 mm). The clinical benefit of using shorter implants would be: the de-

creased chances for surgical perforations of the buccal and lingual plates; the decreased chances for injuring vital structures; and shorter implants would allow more placements without bone augmentation surgery, thus saving patients much pain, money, and time. In some cases, when the posterior ridge is narrow, thus allowing only very narrow implants, placing 2 side-by-side implants will enhance strength and stability, especially in the heavy bruxer (Figure 11).

**THE HUMAN, PRACTICAL PERSPECTIVE: INCLUDING COST**  
With all of the above evidence, it

would be a more "logical approach" to consider the use of narrower and shorter implants in natural bone, even with slight angulations, whenever possible. This approach has fewer surgical complications, is less painful and less expensive, and it allows more clinical cases to be considered as simple. This approach permits the well-trained GP to perform these procedures with a high level of success. On the other hand, the current popular approach of striving for ideal angulated, wider and longer, implants in bone augmented bone, is more expensive and filled with possible surgical complications. Again, for the patient, it is also more painful, more expensive, and places more cases into the difficult/complex category needing bone augmentation. Which would you prefer if you were the patient?

As implants become more and more popular, the resulting higher demand with the need for more well-trained practitioners becomes obvious. As a profession we must find ways to make these needed services more available to our patients, with



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an emphasis on not making them more complicated or expensive. In my private practice, implant procedures are the only procedures which have gone down in price, almost 25% in 5 years. This is due to 2 primary reasons: first, with a little experience, I realize that placing straightforward or simple implants is a relatively fast and uncomplicated procedure; secondly, I have chosen to use implants from highly reputable companies (such as Hiossen and MIS Implants Technologies) that offer a more logical approach to pricing. The much lower cost on implants and parts creates savings that can be passed on to my patients. It is my opinion that the unnecessary high cost of implants, components, and laboratory work, increases the cost of a procedure that should be more accessible to a larger share of the population. Nevertheless, this choice should not be taken lightly. It is our legal responsibility to use a medical device with excellent long-term published research data. We should secure implants and other needed implant-related parts from reputable manufacturers.

**IN SUMMARY**

As a profession, we must remember that tooth replacement is not a luxury; it is often a necessity for health reasons. Although bone augmentation and CBCT and expensive surgical guides are often indicated for complex cases, they are being overused. Simple or straightforward implant cases, when there is sufficient natural bone for narrow or shorter implant, can be predictably performed by well-trained GPs and other trained specialists. Complex cases requiring bone augmentation and other complexities as described herein, should be referred to a surgical specialist. Implant courses and curricula have to be based on the level of complexity of implant surgery that each clinician wishes to provide to his or her patients. Using a "logical approach" to implant dentistry keeps cases simple or straightforward, and more accessible to patients by the correct use of narrow and shorter implants. ♦

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Disclosure: Dr. Ruiz reports no disclosures.



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