Bone Level Dental Implant Versus Gingival Crest Level Implant

INTRODUCTION
Can long lost alveolar bone regrow vertically around a dental implant body, after being loaded into function without the use of grafting materials? If this is possible, how does the mechanism work?

After years of observing vertical bone growth around implants, the author believes this desirable outcome results from specific bone stimulating forces and a transgingival implant neck above the cortical alveolar bone crest. This unique transgingival implant neck design acts as a lattice, allowing lost bone to climb and regrow vertically along the implant surface. Radiographs in this brief article (Figures 1 to 6) confirm vertical alveolar bone growth around dental implant fixtures is possible.

POSITION AND DESIGN
I believe the best implant design, placed in the best possible position, will encourage the most beneficial and desirable outcomes. The new exciting position (as seen in the radiographs presented in this article) seems to say that anatomically correct implant design placed level with gum crest should be the new direction of implantology.

Research into dental implant therapy is focused on minimizing the expected degree of bone loss around dental implants after loading. In the author’s opinion, more research on understanding this new healing phenomena would be warranted. Unfortunately, in light of this new radiographic information, bone level implant therapy as widely practiced today appears to be misguided. Protocol for bone level implant therapy requires implants that are lacking a transgingival neck and placed level or below the cortical bone crest. The absence of a transgingival implant neck makes it impossible for vertical bone remodeling to occur.

THE AUTHOR’S CLINICAL EXPERIENCE
During the last 20 years, I have placed many different shapes of dental implants at many different vertical positions relative to the alveolar bone crest. My clinical experience with different shapes of dental implants show that certain implant designs exhibit different degrees of implant success outcomes when placed into function. It is generally understood that different implant shapes made from the same titanium metal will integrate or bond equally to bone. However, when different designs of dental implants are placed into function, they do not behave in the same way. In fact, it can be said, when different shapes of dental implants are used, different degrees of functional success are exhibited over time. Some are better, some are worse.

My findings indicate that implants, which are designed to closely resemble natural tooth-root anatomy and placed flush with gum crest, seem to show vertical bone growth. Implants, placed at or below bone crest, do not show vertical bone growth. An implant neck that extends through the soft tissue is necessary and acts as a lattice for the bone to climb. This unique implant neck is absolutely necessary for vertical bone growth to occur. Bone level dental implant therapy requires placement of dental implants at or below the cortical alveolar bone crest, without a transgingival neck. This widely used dental implant therapy is not recommended, if we want vertical alveolar bone regrowth to occur. Why? My observations show vertical alveolar bone growth never occurs beyond the implant-prosthetic mating margin. It seems the implant-prosthetic margin, flush at the top of the cortical alveolar bone, makes it impossible for bone growth to occur beyond this point.

Hundreds of thousands of bone level dental implants have been used to date, and I do not know of any reported case of vertical bone growth occurring with these types of implants. Is bone level dental implant therapy the right way to go? In my personal experience, findings (such as those presented in cases 1 and 2 here) seem to indicate the answer to this question is “No.”

Another advantage of gum level dental implant therapy is visual conformation of the prosthetic restoration, eliminating the need for radiographic confirmation, which is often necessary with bone level implant therapy. By restoring the implant at the crest of the soft tissues (instead of deep into soft tissue and in some cases below the cortical bone crest), we avoid a potentially undesirable bone response. My experience shows that margins placed too close to bone will more...
likely result in bone loss around the implant instead of desirable bone growth. Platform switching is used with almost all bone level implants. This is done in order to place a biologically imperfect margin seal away from the bone. In other words, the offending source is placed further away from the bone to minimize bone loss.

After using many different dental implants over the years, my clinical experience suggests strongly that the shape of implants is very important. Generally, I find anatomically correct dental implants exhibit the best long-term functional response. Incorporating a transgingival neck is also important for vertical bone growth to occur. No longer should we expect alveolar bone around dental implants to always fall back from the original level of implant placement. The implants (Basic Dental Implants [Basic Dental Implants]) shown in cases 1 and 2 in this article have been specifically engineered to closely resemble a natural tooth root. The implants are tapered just like a natural root and a unique transgingival implant neck is also used to reflect natural tooth anatomy. Our goal is to produce the best soft- and hard-tissue health around the implants.

Wolff’s law states that bone in a healthy person will adapt to loads it is placed under. It appears long lost bone may be regained when the edentulous areas are treated in a particular manner. Alveolar bone will remodel itself throughout time to become stronger in order to accommodate and deal with a particular load. The internal architecture of the trabeculae undergoes adaptive changes, followed by secondary changes to the external cortical bone; perhaps becoming thicker as a result. It appears anatomical tooth root implants can provide the forces necessary to stimulate desirable vertical bone remodeling. It is clear that Wolff’s law of bone remodeling applies to the cases presented here. However, Wolff’s law does not tell us the amount of force necessary for vertical bone growth around implants to occur predictably. This is left for us to discover by examining the way in which we implement implant treatment. We know that too much or too little force delivered to the bone will cause bone loss. The right force to bone will cause the bone to be maintained and, in some cases, grow, if necessary to withstand functional load delivered.

**CONCLUSION**

Can we cause vertical bone growth to occur vertically around dental implants? The answer to this question is a definite yes, providing the right forces are delivered to the bone in a particular manner. How can we ensure bone is stimulated correctly? It appears that we need to start with a dental implant that is most similar to a tooth root with a transgingival neck. Bone level dental implants seem to be contraindicated based on my findings, simply because there is no neck above the cortical bone crest for vertical bone growth to occur if necessary, to withstand forces of mastication. Our challenge will be to accurately quantify the necessary forces for vertical bone growth to occur predictably.

**References**


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