

## A Comparative Study on the Use of Bovine Driven Xenograft and Autogenous Bone in Combination with Bioresorbable Collagen Membrane in Artificial Bony Defect on Dog's Mandible

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The quantity of bone is an important factor in the long-term success of implants. In cases where bony defects were present, guided bone regenerations have been performed to aid the placement of implants. Substitutes with osteoconductive properties and growth factors have been used in the past to promote bone growth. Nowadays, however, the accepted principle is to isolate bone from soft tissue penetration by using barrier membranes to allow room for generation of new bone. Nonresorbable membranes have been used extensively since the 1980's. However, this material has exhibited major shortcomings, such as the frequent exposure of the membranes after surgery. To overcome these faults, efforts were made to develop resorbable membranes. Guided bone regenerations utilizing resorbable membranes were tried by a number of clinicians Bio-Gide® (Geistlich Biomaterials, Wolhusen, Switzerland) is such a bioresorbable collagen barrier for guided bone regeneration that is easy to use and has shown fine clinical results.

The aim of this study was to evaluate the histological results of guided bone regenerations performed using resorbable collagen membrane(Bio-Gide®) with autogenous bone, Bovine Driven Xenograft (Bio-Oss®: Geistlich Biomaterials, Wolhusen, Switzerland) and combination of the two. Surface morphology and chemical composition was analyzed to understand the physical and chemical characteristics of Bio-Gide® and their effects on guided bone regeneration.

The following results were obtained:

1. Bio-Gide® is pure collagen containing large amounts of Glycine, Alanine, Proline and Hydroxyproline.
2. Bio-Gide® is a membrane with collagen fibers arranged more loosely and porously compared to the inner surface of canine mucosa. This allows for easier attachment by bone-forming cells. Blood can seep into these spaces between fibers and form clots that help stabilize the membrane. The result is improved healing.

## Oral Presentation

3. Bio-Gide® has a bilayered structure. The side to come in contact with soft tissue is smooth and compact. This prevents soft tissue penetration into bony defects. As the side in contact with bone is rough and porous, it serves as a stabilizing structure for bone regeneration by allowing attachment of bone-forming cells.
4. The amount of bone fill in the defect area, regardless of using membrane, increased in order of autogenous bone+Bio-Oss®, Bio-Oss®, autogenous bone, and blood.
5. Comparing the amount of bone fill, irrespective of the kind of bone substitute, the right side using membrane showed better result than the left side as control.
6. Autogenous bone showed much more bone resorption than autogenous bone+Bio-Oss®, Bio-Oss®.
7. There was most unclear margin between bone and bone substitute where Autogenous bone used, but with Bio-Oss, or autogenous bone + Bio-Oss, showed clear margin.
8. Bio-Gide or Bio-Oss, even 3 months after surgery, were not resorbed and we can distinguish these from original bone.