Simultaneous Placement of XGate Dental Implants with Guided Bone Regeneration

This clinical case highlights a successful bone augmentation procedure. This report details the first stage of treatment: the placement of two implants in the upper right quadrant of the maxilla.

The description of this case was provided by **Dr. Michael Carmy** from **California**. Dr. Carmy has over 20 years of experience in dentistry, including more than a decade specializing in Dental Implantology and digital workflows.

First, let's get acquainted with the doctor:

Dr. Michael Carmy

Main areas of expertise: Full Arch Restoration, advanced laser dentistry (LANAP & LAPIP)

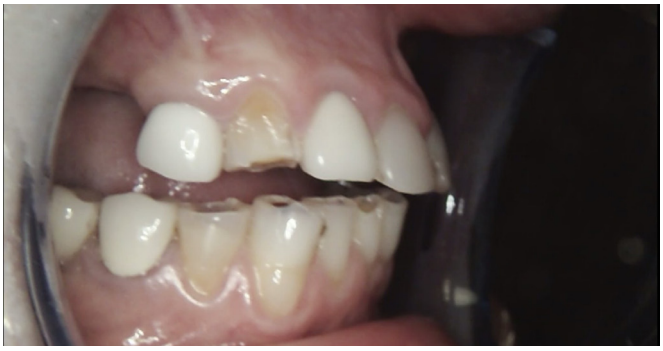
Experience: 20 years

Workplace: **Rialto, California, USA**

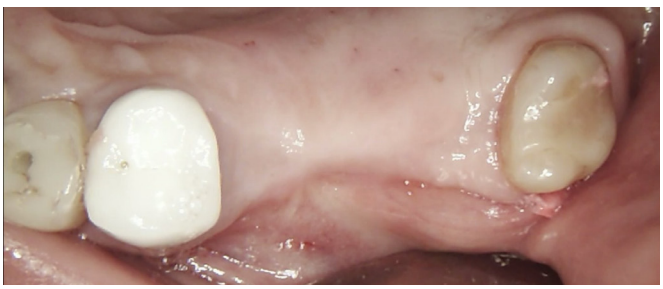
Initial clinical situation of the patient

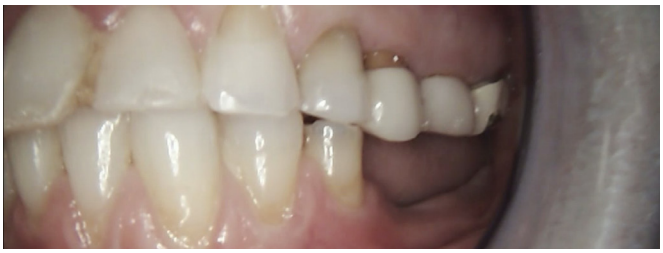
Missing teeth:

- Posterior right maxilla



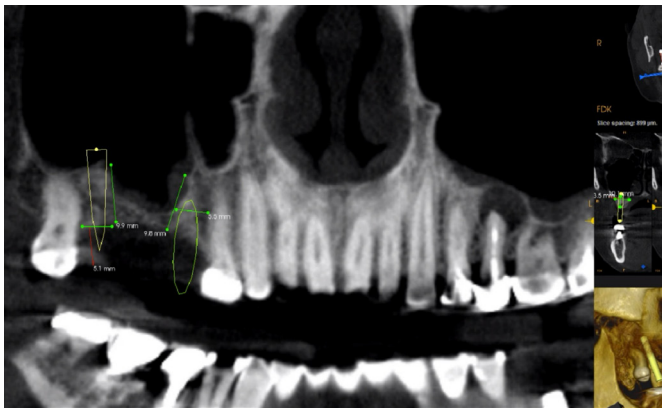
- Posterior left mandible





Treatment procedure

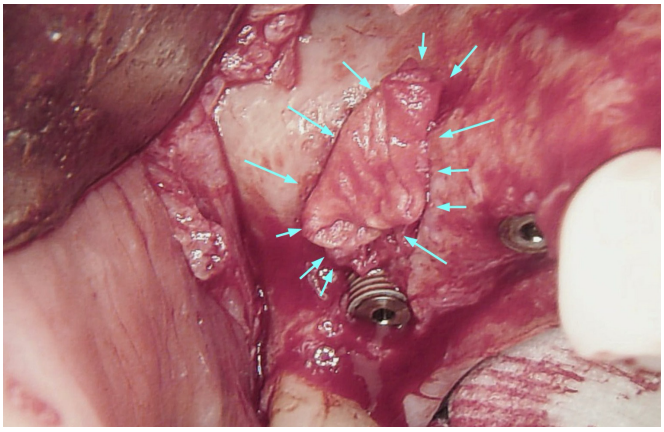
The treatment of the maxilla was complicated by significant bone volume deficiency, necessitating bone grafting to enable implant placement. The image below clearly illustrates the limited available bone and indicates the planned implant positions.



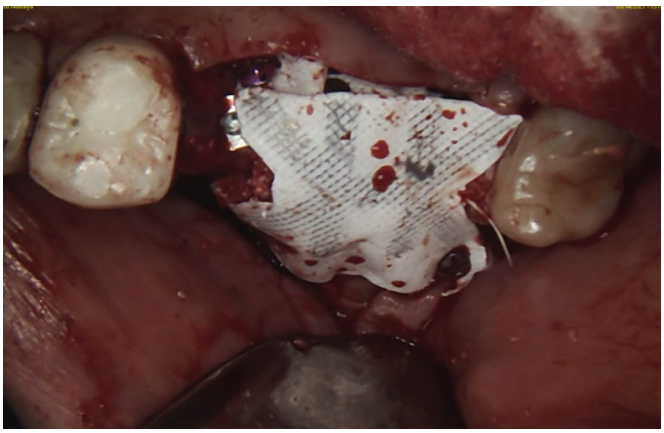
To restore the required bone volume, a sinus lift was performed using a technique pioneered by Dr. Istvan Urban, which is characterized by high predictability and stable results.

In essence, this technique differs from a classic sinus lift in that the bone graft material is secured by a dual-membrane approach.

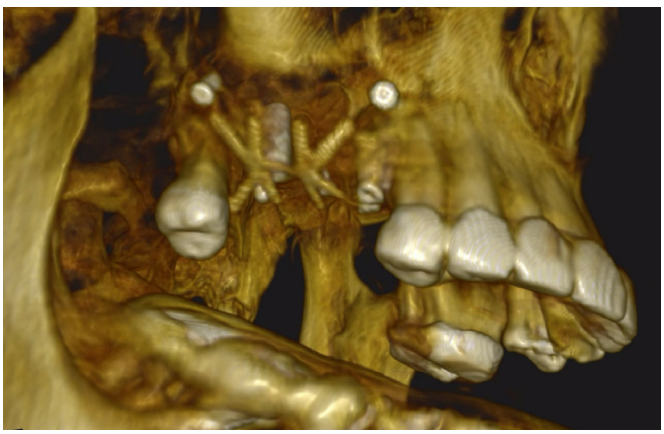
A resorbable collagen membrane is placed in direct contact with the graft material. This membrane dissolves as the site heals (see image below).



Equally important is ensuring the rigidity of the structure containing the graft material. To achieve this, titanium-reinforced PTFE (Teflon) membrane was placed, as shown in the image below.

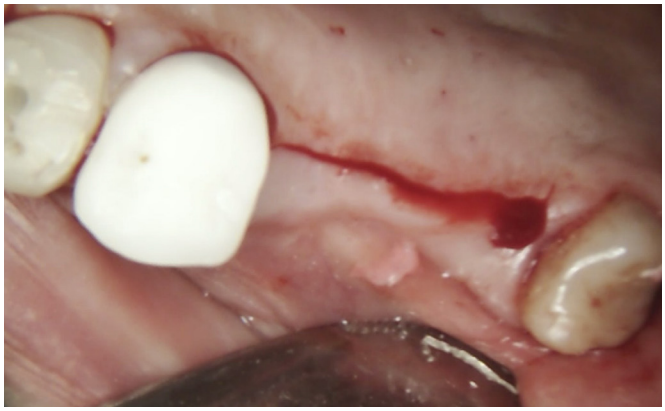


The following photo shows what the membrane looks like on a CBCT scan. The reinforcing plate and pins that fix the membrane are clearly visible here.



Let's look at the treatment procedure in more detail.

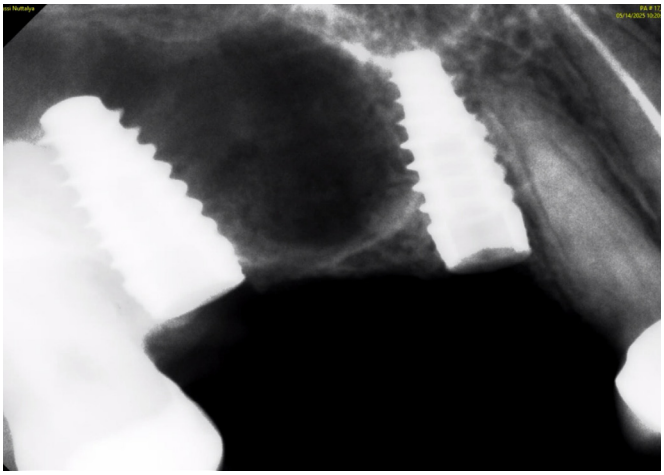
First, an incision was made and the soft tissue was reflected.



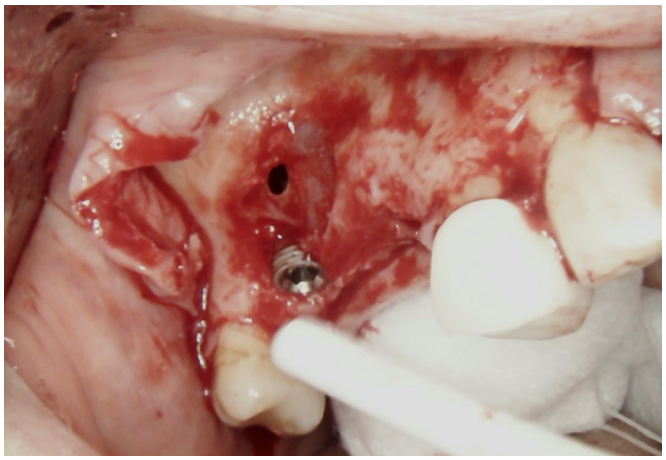
Despite the bone deficiency, two implants were placed:

- Ø5.0 x 10 mm implant in the molar position
- Ø4.2 x 10 mm implant in the premolar position

XGATE Dental
X3 Internal Hex

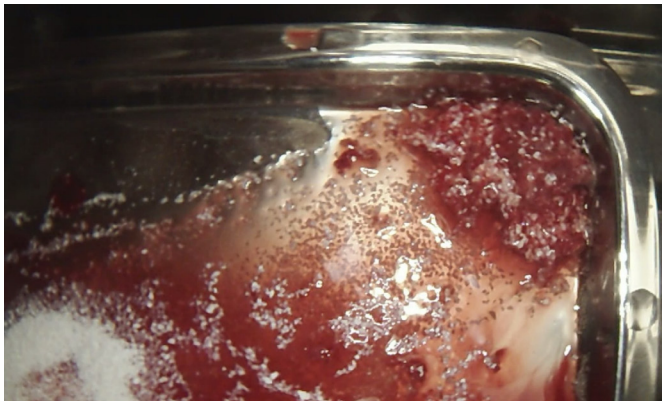


Next, a lateral window osteotomy was performed to access the maxillary sinus. The bone graft material was then placed into this space.



The composition of the bone graft material is noteworthy. The graft consisted of a 50/50 composite of autogenous bone and a xenograft. The autogenous bone provides viable osteogenic cells for rapid integration, while the xenograft acts as a scaffold, providing volume and structure for new bone formation. If a defect is filled only with autogenous bone, there is a higher risk of resorption before a sufficient volume of new bone can mature.

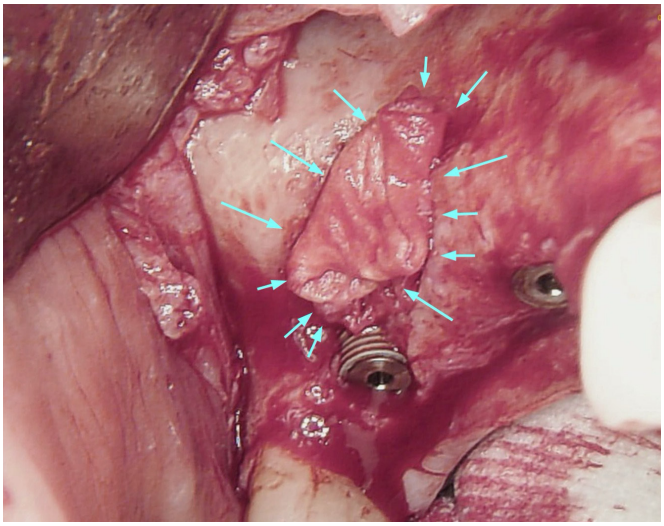
The mixture was also enhanced with GEM 21S, a growth-factor enhanced bone graft. As a completely synthetic material, it eliminates the risks associated with allografts.



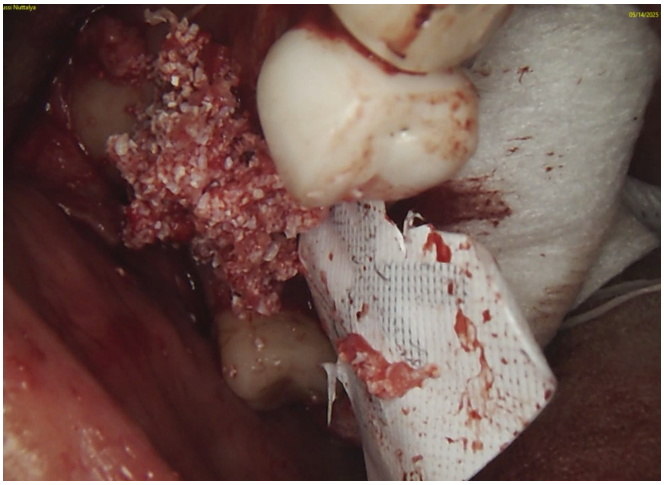
GEM 21S contains a recombinant human platelet-derived growth factor, which stimulates the migration and proliferation of osteoblasts, cementoblasts, and fibroblasts. The addition of this biomaterial promotes mesenchymal stem cell proliferation, angiogenesis, and early osteoblastic activity.

Furthermore, the patient's own blood, present in the autogenous bone chips, serves as a natural source of platelets and a binding agent, creating a malleable consistency ("sticky bone"). This consistency is ideal for contouring the graft and ensuring its stability at the recipient site.

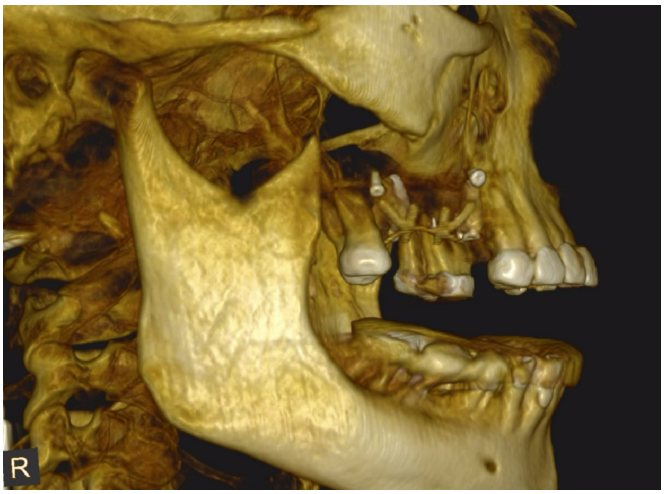
The "sticky bone" mixture was then carefully packed into the subantral space, elevating the Schneiderian membrane. This graft volume was then covered with the resorbable collagen membrane, as shown in the picture.



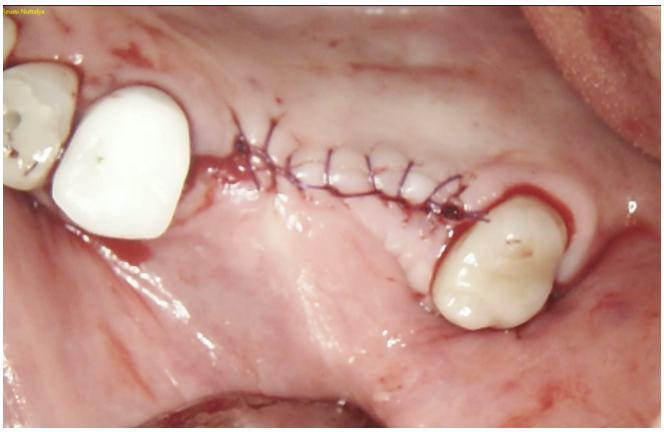
Next, a small amount of graft material was placed over the collagen membrane before the non-resorbable membrane was secured over the entire site.



The membrane was stabilized with pins, which are clearly visible on the CBCT scan.

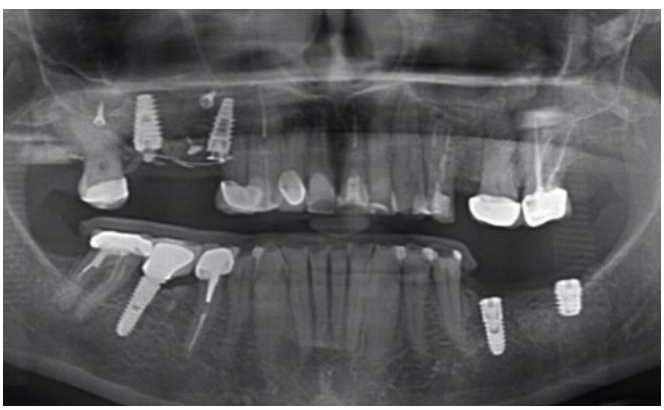


Following the fixation of the PTFE membrane, the flap was repositioned and sutured. Postoperative radiographs were taken, and the patient was dismissed.

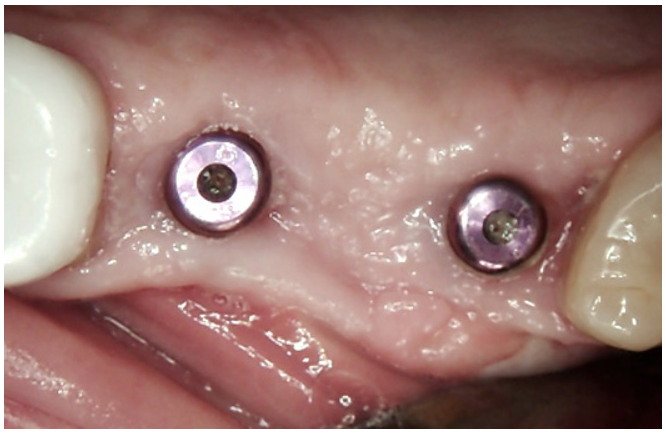


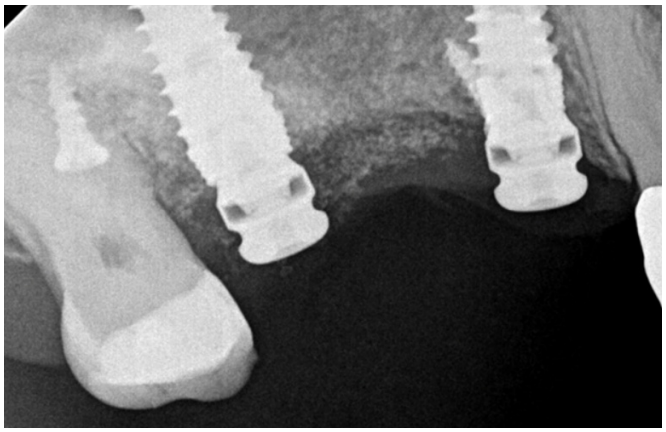
The radiograph confirms the implants are in a prosthetically favorable position.

Note: Two implants were also placed in the posterior left mandible according to a standard two-stage protocol. We will not go into details here.

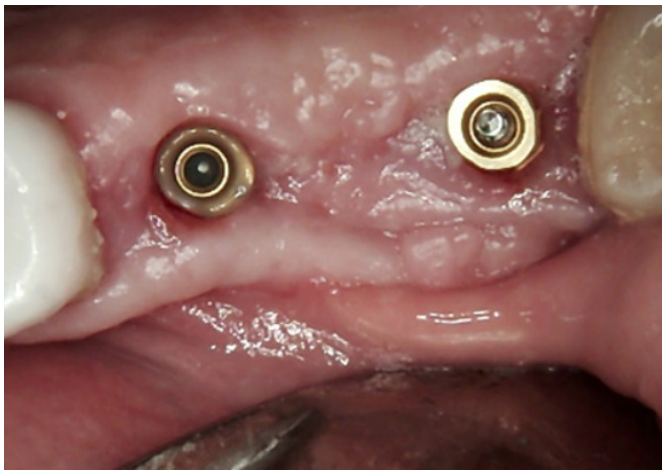


The healing process was monitored by Dr. Carmy over a period of five months. At the intermediate stage, the patient received healing abutments. As shown in the clinical photo, the soft tissues around the abutments demonstrate adequate density and stability.



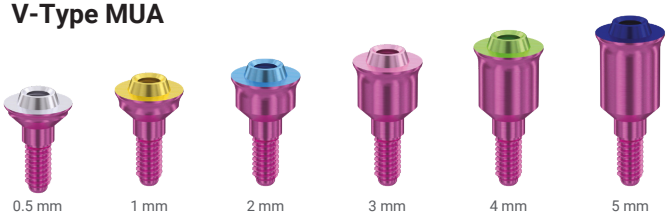


After the healing phase was completed, 1 mm V-Type multi-unit abutments were placed, as indicated by their corresponding color coding.

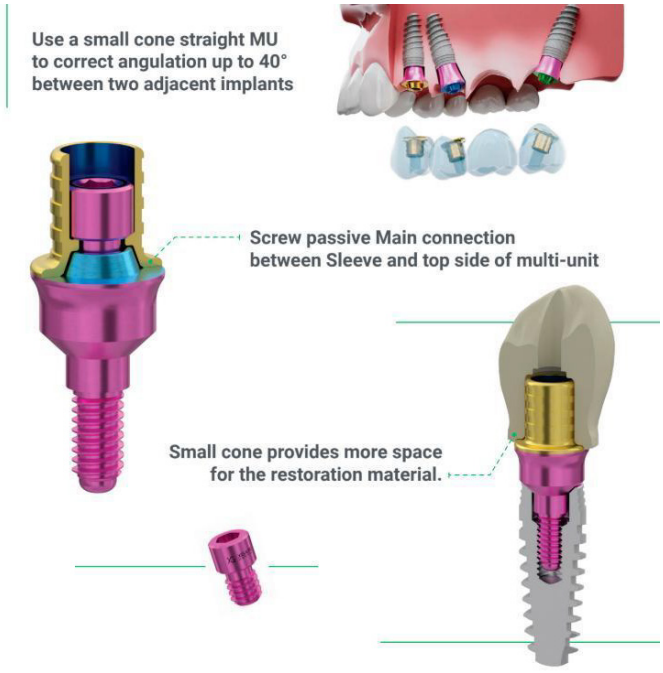


The color coding of XGATE multi-unit abutments (MUA) merits special attention, as each height option is assigned a distinct color. The minimum available height is 0.5 mm—a feature not offered by many manufacturers—despite the fact that clinical situations requiring abutments of minimal height occur relatively frequently.

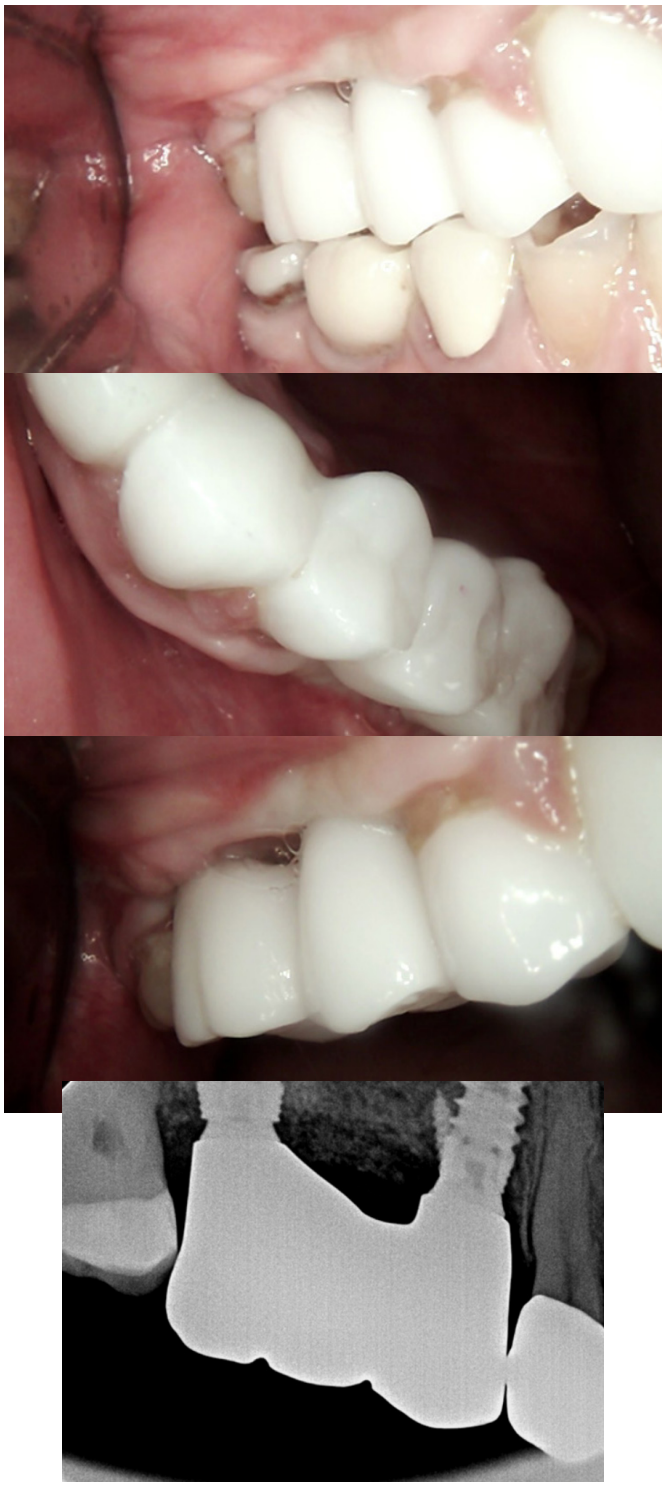
V-Type MUA



These abutments were selected for their large 10 mm² support surface area and their ability to correct implant angulation discrepancies of up to 40°. Additionally, their low-profile conical design (0.8 mm height) minimizes the risk of thinning the prosthetic material at the abutment interface—a potential issue with other multi-unit systems.



The following images show the final restoration — a screw-retained bridge supported by V-Type multi-unit abutments from the German company XGATE Dental.



The marginal bone level remains stable, and the soft tissue profile has improved significantly compared to the initial condition. However, the image below shows a less-than-ideal contact between the gingiva and the prosthetic restoration, which may require soft tissue correction using a free gingival graft in the future.

We hope this clinical case has been informative

If you have any questions regarding the specifications
or ordering options for XGATE products,
please feel free to contact us.

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