Technique Review:

Fiber-Reinforced Implant-Supported Overdentures

Demonstration model shows overdenture fiber structure on the left an finished denture on the right

Concept and advantages:

Over the past 10 years, both fixed and removable dentures on implants have become commonplace and are readily available by dental professionals. Implant supported overdentures are commonly fabricated on anywhere from 1 to 4 implants and offer patients a significant increase in stability and improved mastication. They can be much more affordable than fixed implant alternatives, making it a more accessible solution.

The material of which the prosthesis is made (generally PMMA acrylic resin) is subject to significant deformation with strong peaks of pressure affecting the abutments and attachments. Clinically, fractures of the acrylic base plates is usual, the fracture being caused by shearing forces and fatigue. The generally accepted solution is to make the base plate more rigid by using a cast metal framework (Fig. 1).

FRC Fiber-reinforced dentures have become more commonplace for a variety of reasons and are ideal for implant-supported cases. These materials are highly accepted in aeronautical, nautical and sports applications as materials of choice, due to their high fracture resistance and superior tensile strengths. Fiber mesh (Fiber Force mesh) exhibits a threefold increase in fracture resistance, from 80 MPa to about 280 MPa[1] (Fig. 2), when compared to unreinforced acrylic. In addition, it offers many advantages to both clinician and patient:

- It chemically bonds to the denture acrylic, unlike metal;
- It is lightweight in the mouth, thin, invisible and very comfortable;
- No additional costs for lab or patient vs. cast metal
- It is highly fatigue-resistant, and does not fracture over the useful life of the prosthesis;
- It is fast and inexpensive to produce, and causes no delays to wait for a cast metal reinforcement.

Fig. 1: Cast metal frameworks are unsightly, heavy, and do not bond (only mechanical bond) to denture acrylics

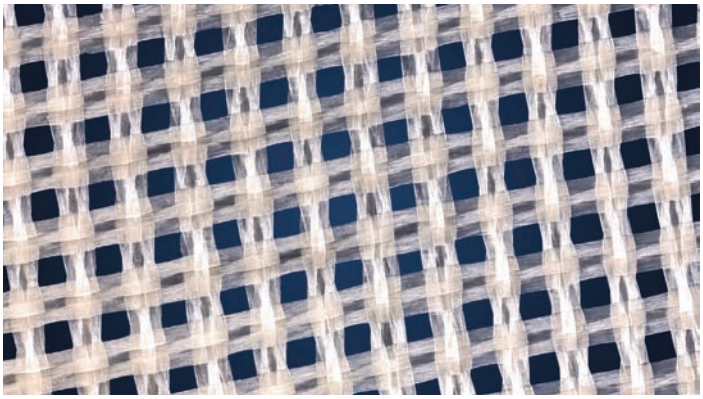

Fig. 2: Preimpregnated Fiber Force mesh creates a strong monobloc with the denture resin that will not debond or cause catastrophic failure.

1. Kim S. H., Watts D.C., "The effect of reinforcement with woven E-glass fibers on the impact strength of complete dentures fabricated with high-impact acrylic resin"; Department of Prosthetic Dentistry, Ewha University, Seoul, Republic of Korea

Triple your success with FiBER FORCE® & CST®

- Create strong & fatigue-resistant appliances
- The reinforcement becomes part of the acrylic and cannot debond
- Esthetic and lightweight for patients, fast and flexible to produce

FiBER FORCE® & CST® are a step forward from unreinforced, cast and milled alternatives for just about any application using dental acrylics.

"We use FiBER FORCE® as a support structure inside the denture bases of all our implant over dentures. It is stronger than similarly designed metal structures and it is virtually invisible. Our denture bases can be made to a more natural contour because FiBER FORCE® doesn't need to be thick and bulky to be strong."

Duane Baluke RDT, President
Baluke Dental Studios

"Acrylic, by itself, is not a good enough material for a transitional restoration. CST® is a product that I've used for several years that has had a significant impact on our practice."

Dr. Saj Jirvaj
Anacapa Dental Institute

SYNCA

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Technique summary highlights:

Fig. 3: After five months osteo-integration of the implants, several balls attachments are screwed on the implants.

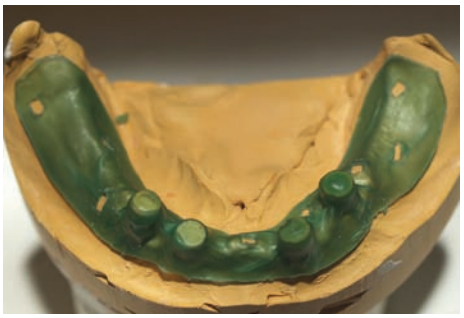

Fig. 4: Tissue stops are cut out in the wax spacer. With metal caps already in place on attachments, a wax spacer as thin a 0.5mm is made to create space.

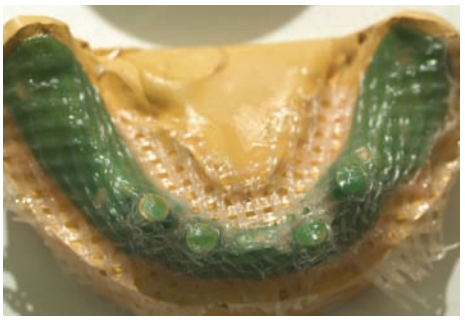

Fig. 5: The Fiber Force mesh is roughly cut to size, placed on the model.

Fig. 6: The model is placed in the EZ VAC vacuum unit, which compresses the fibers for highest strength and adapts the mesh to the shape of the model

Fig. 7: Minimizing the thickness of the framework. The complete case is inserted into any lab light curing unit and then polymerized.

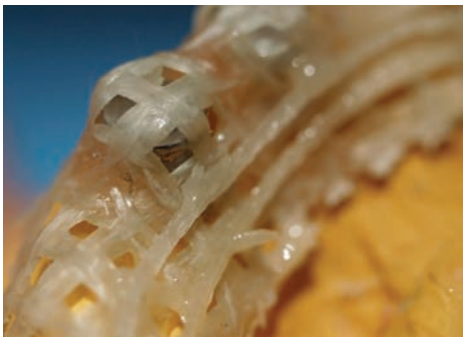

Fig. 8: The wax is removed and the polymerized mesh is trimmed and returned to the model.

Fig. 9: The denture is then fabricated using either a press or injection technique, and the precision attachments are bonded in the mouth or indirectly when packing or injecting the arylic. The resulting denture is esthetic, strong, lightweight and highly fatigue resistant.

Fig. 10: The start-up cost to use Fiber Force is low. All the materials and products to complete new dentures, implant supported overdentures, and denture repairs are included in the Fiber Force intro kit.