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Unleashing My *Creativity*

Understanding the Complexities and Intricate
Details of Tooth Morphology

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The Dental Morphology, Function and Esthetics (DMFE) module taught by Dr. Pascal Magne

at the Herman Ostrow School of Dentistry of USC is unique in that, from Day One, students are immersed in learning about the outline, grooves, transitional line angles, and oblique ridges that help to define and individualize a tooth. The module began with a focus on anterior tooth morphology; this not only increased our knowledge, but also enhanced our "eye for beauty." Also integrated into the module were guest lectures that introduced us to principles of biomimetics, temporomandibular joints and diseases, laboratory techniques, dental materials, and societal versus individual perceptions of beauty. The second part of the course focused on posterior teeth, bringing everything together as a whole arch.

For both areas of concentration, the "2D-3D-4D" approach was used. First, we explored our artistic skills through sketching different views of singular teeth. Next, we worked with white wax to recreate the detailed morphology of the grooves, pits, and fissures within each tooth (**Fig 1**). Last, we experimented with different dental materials such as New Outline acrylic resin (Anaxdent; Ardmore, OK) to produce exquisite cutback mock-ups that can mimic

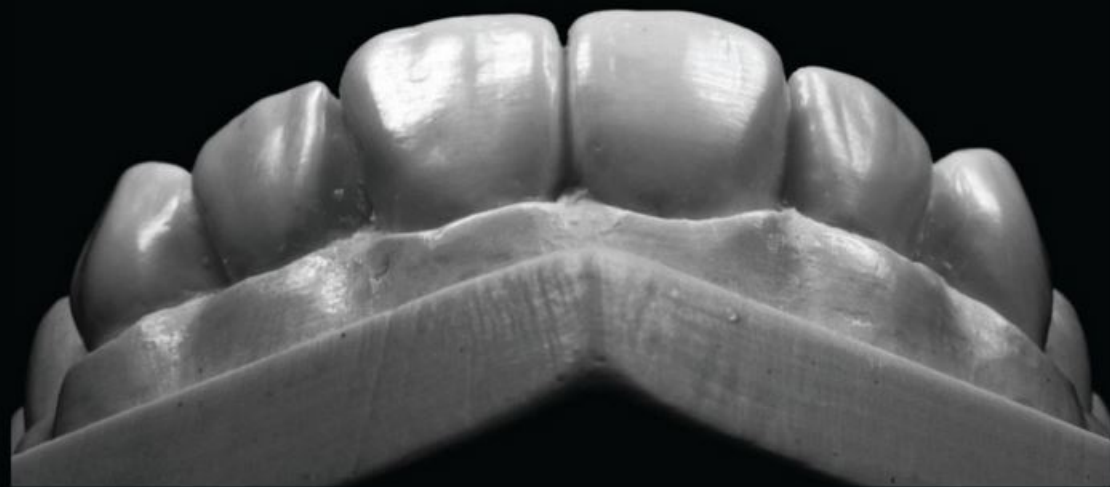


Figure 1: Labial view of canine-to-canine full wax-up on white stone cast.



Figure 2: Transilluminated mock-up simulating the dentinoenamel interface.

the natural biological structure of the dentinoenamel interface (**Fig 2**). Throughout the entire course, faculty members and teaching assistants worked closely with us to show us all the different aspects of the profession. Their expertise dovetailed with the videos that Dr. Magne personally recorded for each step of every project. Being able to watch these videos as we completed our own wax-ups and cutback mock-ups allowed for a very detailed review and minimized the chance for errors. Step-by-step manuals provided in this course outlined the important concepts and provided examples to follow along with each new skill we were learning to develop. I think the DMFE module went above and beyond in the cohesive way it taught students who were completely unfamiliar with this territory.

I was fortunate to have a relatively solid background in the art of pencil sketching and clearly understood the concepts of light and dark used to represent a three-dimensional object, such as a tooth, in a two-dimensional drawing. This seemingly unrelated and basic exercise helped me to recognize the different cusps and grooves that exist in a tooth. Moving on to partial and full wax-ups on stone casts was the highlight of my experience in the DMFE module; I greatly enjoyed working with a malleable material that can be melted and shaped to simulate the delicate outlines of a tooth. I learned and loved how I could make a sharp mesial angle but also a smooth, soft distal transition with just a stroke of the heated metal instruments (**Fig 3**). I found my passion and was able to unleash my creativity while constructing my own tooth; it was a great exercise that definitely helped me to understand the outline and shape of each tooth (**Figs 4a & 4b**). Building upon these skills,

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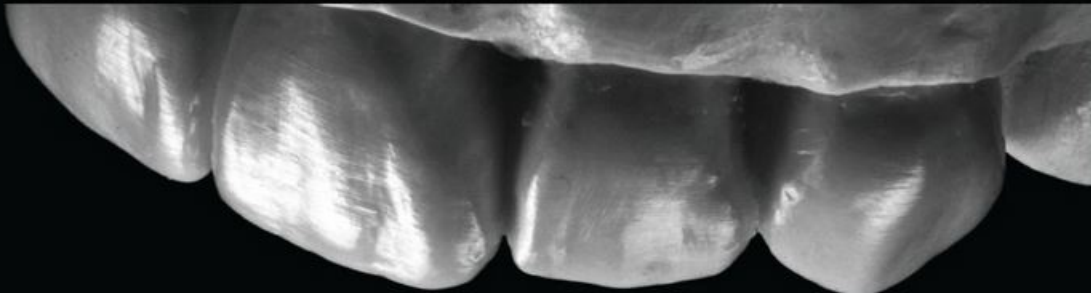
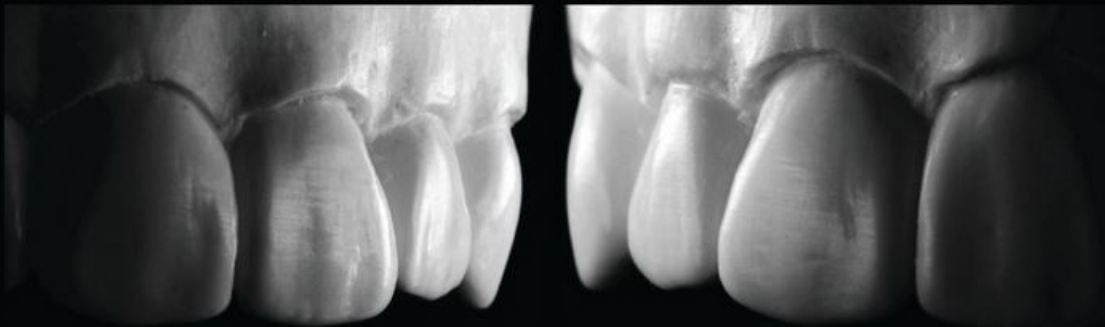


Figure 3: Angled view of wax-up emphasizing straight mesial lobes and round distal lobes on central and lateral incisors.



Figures 4a & 4b: Straight views of left and right anterior wax-up showing three lobes and horizontal texture.

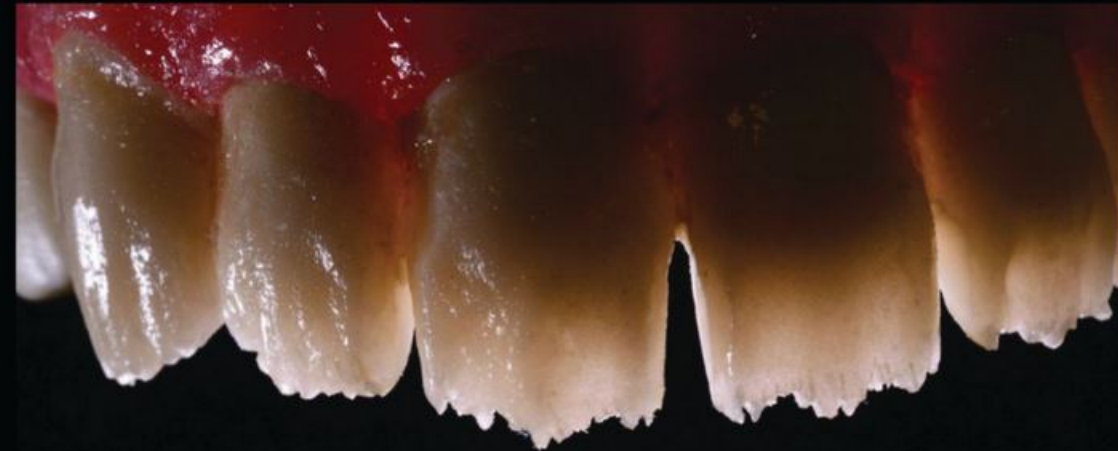


Figure 5: Cutback stage representing inner dentin layer with subtle color staining.

the last “canine-to-canine” cutback exercise topped it all off (**Fig 5**). As a result of learning how to fabricate four-dimensional mock-ups of a full set of anterior teeth, I feel confident in my ability to create restorations that can mimic the translucency of enamel and show through to the dense and strong dentin below (**Fig 6**). I was even able to create the illusion of mamelons through color staining and the dentin cutback layer, giving my mock-ups the look of natural dentition.



Figure 6: Labio-incisal view of final cutback mock-up.



Figure 7: Transilluminated mock-up emphasizing translucent enamel and more dense dentin cutback showing through.

During my time in the DMFE course, I felt a strong connection to the principles of biomimetics. Although esthetic dentistry had always appealed to me and highlighted my artistic side, I never really knew all the complexities and intricate details that were concealed beneath that hard enamel surface (**Fig 7**). This module helped me to better understand what was underneath the surface, making me a better dental student with greater confidence and creativity when restoring teeth. The course not only taught the basics of tooth morphology, its function, and occlusal properties, but it also has enhanced my esthetic restorative ability through increased exposure to high-quality materials and advanced application techniques (**Figs 8 & 9**). Overall, I believe that the DMFE module was very beneficial to my dental education and gave me skills that will further my goals in esthetic dentistry. Last year, I was given the opportunity to serve as a teaching assistant to the first-year dental class of 2018; it was very satisfying to pass on what I had learned and, hopefully, help to instill in future dentists and colleagues the same passion and dedication that I feel. **JCD**



Figure 8: Straight view of anterior cutback mock-up.



Figure 9: Frontal view of cutback mock-up with color staining to emulate the natural beauty of teeth and interpapillary gingiva.

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