CAD/CAM Dentures

Computer Aided Design - Computer Aided Manufacturing

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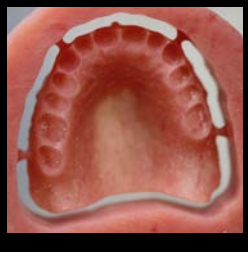
CAD/CAM Dentures

Objective: In this lecture you will learn how complete dentures can be fabricated using CAD/CAM technology.

AvaDent™ Digital Dentures

- **It is a system by which impressions, interocclusal records, and tooth selection can be completed in one appointment and the dentures fabricated using CAD/CAM technology**



Disclosure

- **I do not have any financial interest in Global Dental Sciences, the company producing AvaDent™ digital dentures**

Summary of Advantages of CAD/CAM Complete Dentures

- **It is possible to record all the clinical information for complete dentures in one appointment (1-2 hours)**

Traditional	CAD/CAM
Appt. #1 - #6	Appt. #1
• Baseline & Preliminary Impressions	•Baseline & Preliminary Impressions
• Final Impressions	• Final Impressions
• JRR & Anterior Tooth Selection	• JRR & Anterior Tooth Selection
• Anterior Tooth Try-in	• Anterior Tooth Try-in
• Posterior Tooth Try-in	• Posterior Tooth Try-in
• Delivery & Adjustment	Appt. #2
	• Delivery & Adjustment

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- Less clinical chair time provides the opportunity for a more cost-effective set of appropriately accurate complete dentures

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- The denture base fit is superior to that of conventionally processed bases

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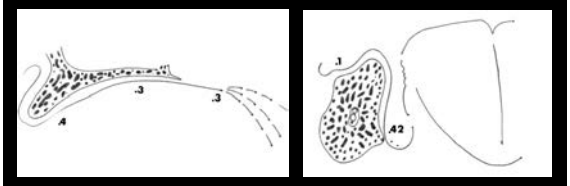
Dimensional Change of Methyl Methacrylate

Anthony, D. H., Peyton, F. A.: Dimensional Accuracy of Various base materials. JPD 12:67-81, 1962



"5 Axis Milling Machine and Fine Milling Tools"

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- AvaDent™ denture base material has lower *C. Albicans* adherence

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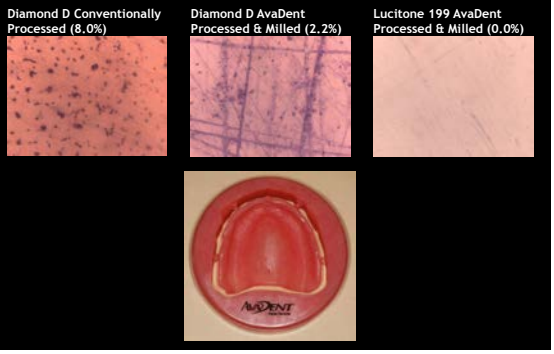
C. Albicans Fungal Adherence

Percent of Surface Area with *C. Albicans*



CAD/CAM Denture Procedures

- Conventional Methods
- Anatomic Measuring Device (AMD)
- Duplicate Dentures
- Use of "Good Fit" Tray

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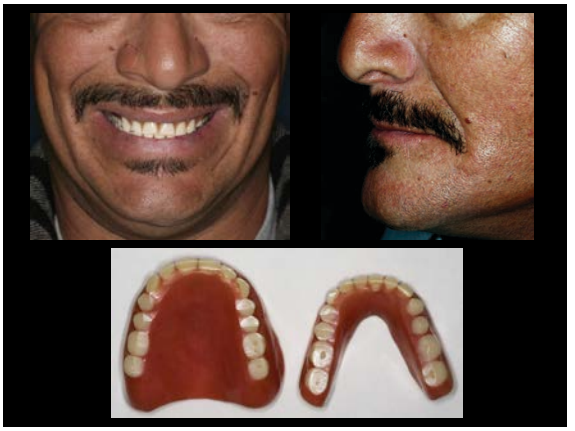
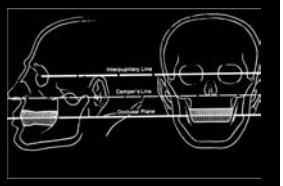


Information Required for CD's

- Horizontal Plane
- Midline
- Incisal Line
- Lip Support
- CR
- VDO



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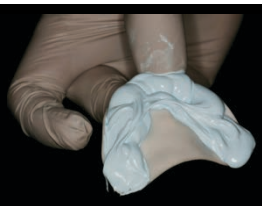
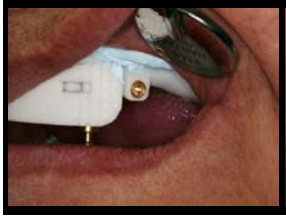
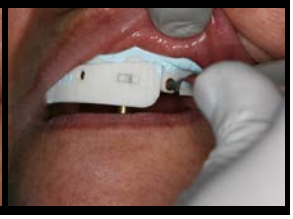
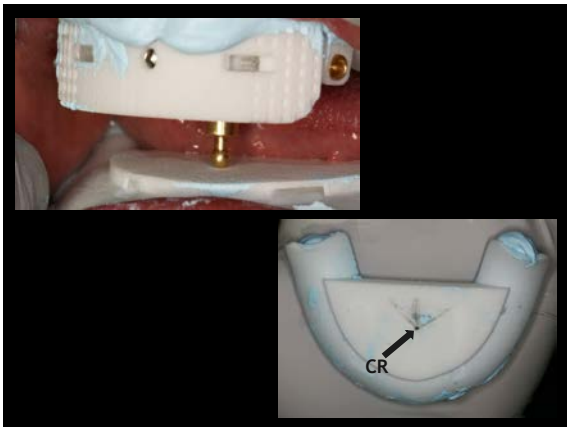
- AvaDent AMD

Anatomical Measuring Device (Used to adjust and hold OVD, serve as a gothic arch tracing device, and also provide upper lip support adjustment



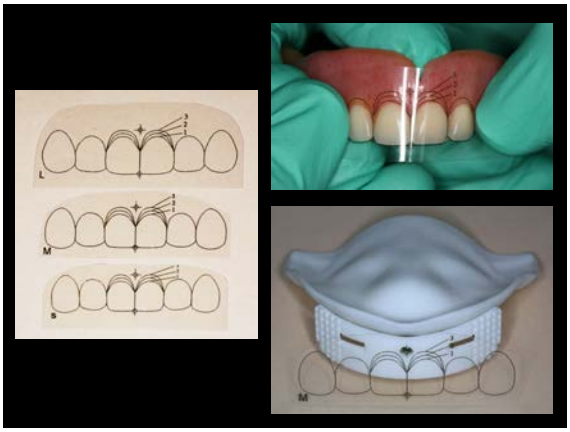


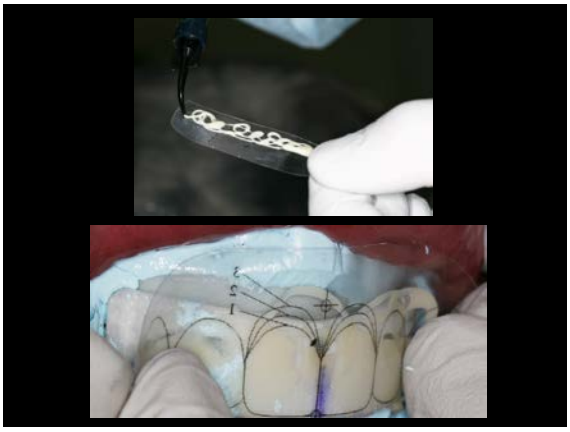


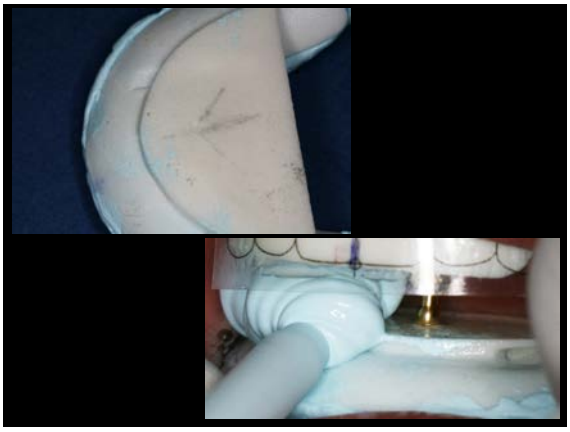

CR


Occlusal Plane Orientation
AVADENT

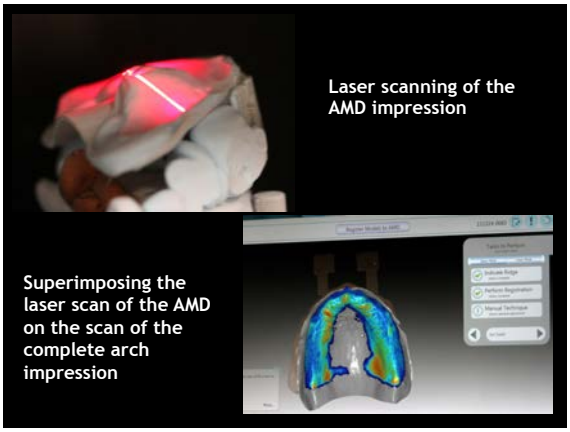

AVADENT

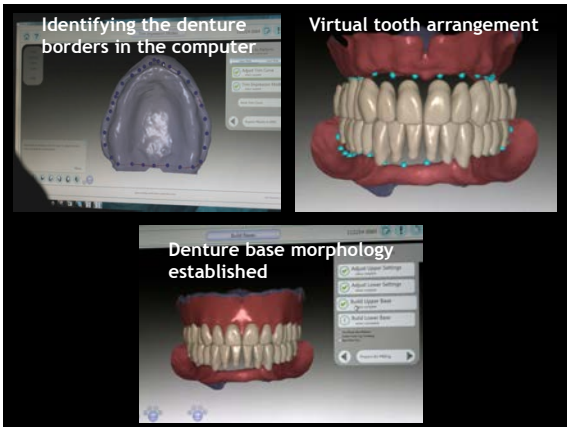


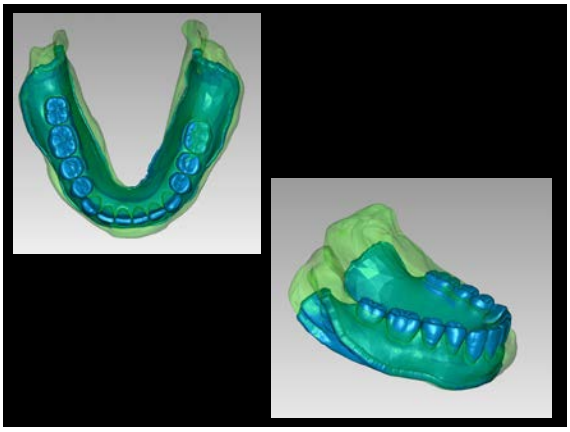





Spraying the impression so it can be more easily recorded during the laser scanning


Laser scanning of the AMD impression
Superimposing the laser scan of the AMD on the scan of the complete arch impression

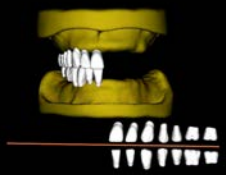

Identifying the denture borders in the computer
Virtual tooth arrangement
Denture base morphology established



Concepts of Occlusion

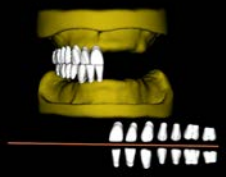
- Balanced Articulation
  "Anatomic"
- Non-Balanced Articulation
  "Neutrocentric or Monoplane"
- Lingualized Articulation

Bilateral Balanced Articulation

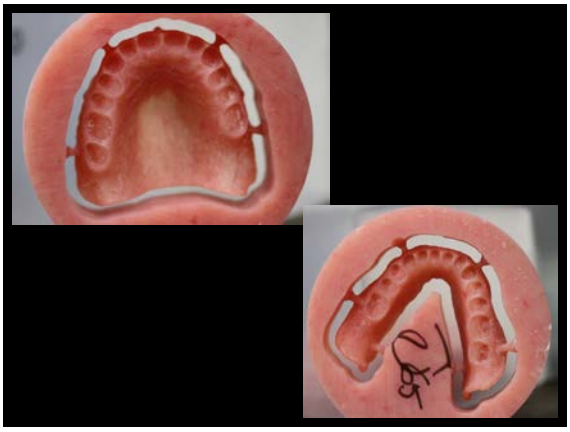


Non-Balanced Articulation

Lingualized Articulation



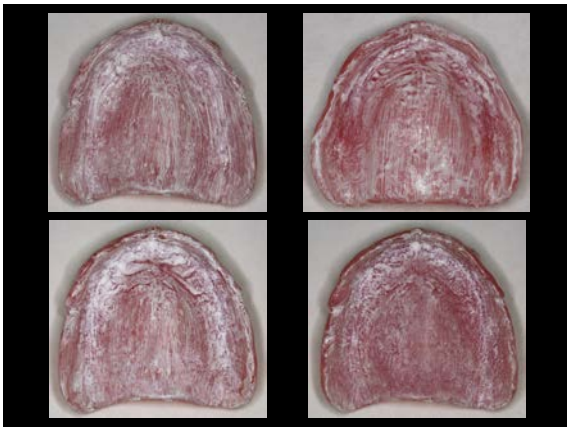
The Base Milling Procedure



Denture Tooth Bonding

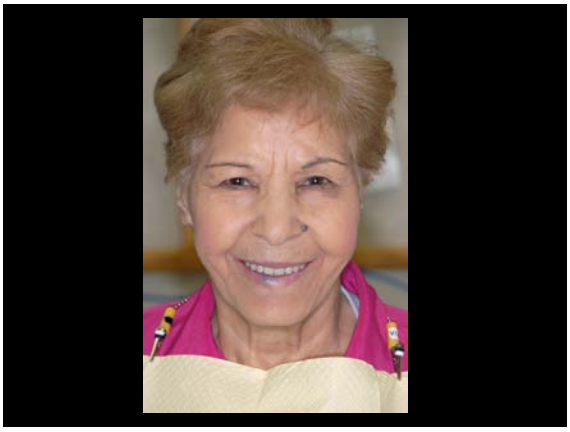
- Lucitone & Vivodent teeth
- Diamond D & Vivodent teeth
- Lucitone & Portrait teeth
- Lucitone & Ivostar teeth
- Diamond D & Ivostar teeth
- No adhesive failures
- Mostly cohesive fractures of the denture tooth and a smaller number of cohesive fractures of the base resin

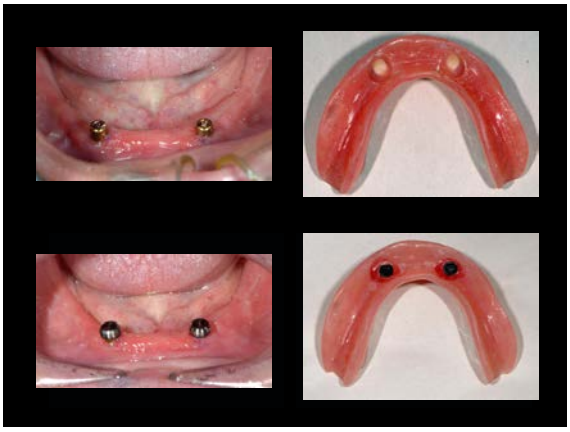
Dental Biomaterials Research Laboratory, State University of New York at Buffalo




The First AvaDent CAD/CAM Denture Done at UCSF SOD


Centric
Working
Balancing
Protrusive





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Duplicated Denture Used To Fabricate New AvaDent Denture

Courtesy of Dr. Charles Goodacre

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Impression made using duplicate denture and then centric relation jaw record made

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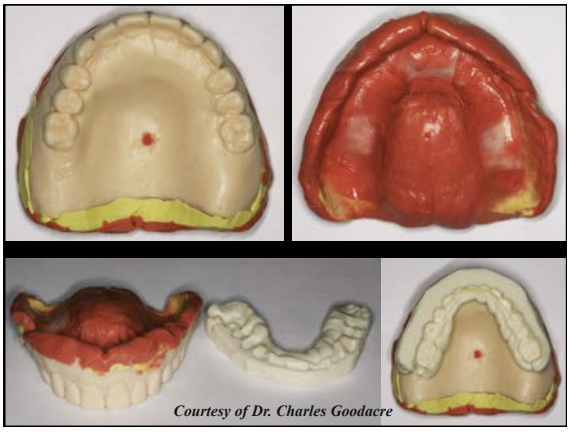

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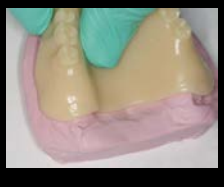
Good Fit™ Technique:

It is a Thermoplastic denture for use as an impression tray & "wax rim"

Adapting Good Fit™ denture to poly(vinyl siloxane) cast made from existing denture

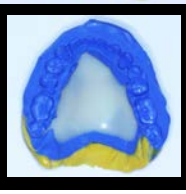




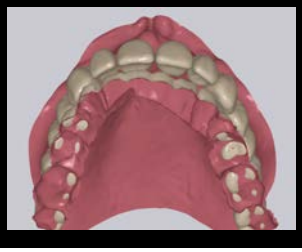

It is a relatively easy technique when there is substantial residual ridge resorption……








You can arrange the facial surfaces to achieve the desired esthetic arrangement and then the occlusal surfaces of the denture teeth can be milled to match the opposing dentition





AvaDent Digital Dentures

- Complete Upper/ Lower
- Single Upper/Lower
- Over-Dentures
- Immediate Dentures
- Denture Bases

Immediate CAD/CAM Dentures

Mounted casts provide all of the information required; horizontal plane, midline, incisal line, lip support, CR, VDO!

Before, old FPD

After, temporary CAD/CAM CD