

"The patient and I are extremely pleased with the results. We could not have achieved this without the model. Everyone is very appreciative"

Jon P. Bradrick,

DDS, Associate Professor, Director,
Division of Oral & Maxillofacial
Surgery, MetroHealth Medical Center



Case Study

At a Glance

Company: The MetroHealth System

URL: www.metrohealth.org/

Location: Cleveland, Ohio

Industry: Community Health Center

Challenges

- Ensure optimal outcome for complex maxillofacial surgeries, while minimizing surgery times
- Facilitate planning of complex surgical procedures
- Create highly accurate anatomical 3D models of oral structures to evaluate treatment scenarios

Solution

Eden500V™ 3D Printing System
from Objet Geometries

Results

- Quick turnaround time of model fabrication
- Optimized pre-surgical planning
- Quicker and less invasive oral surgeries

Objet Helps to Optimize Surgical Outcomes through Precise Anatomical Modeling

In cases where complex, multi-faceted surgical procedures are required, the ability to predetermine the best possible outcome is key. Anatomical modeling – made possible through the use of advanced 3D printing systems – allows surgical teams like MetroHealth’s Division of Oral and Maxillofacial Surgery to evaluate several different treatment scenarios before deciding on a plan that ensures these needs are met.

The MetroHealth system is one of the largest, most comprehensive health care providers in Northeast Ohio, serving the medical needs of the Greater Cleveland community for 170 years. In the Division of Oral and Maxillofacial Surgery, patient care concentrates on maxillofacial trauma, oral pathology, facial reconstruction, correction of facial deformity, dentoalveolar surgery, dental implants and ambulatory anesthesia.

The MetroHealth oral and maxillofacial surgery team needed a solution that would let them optimize the outcome of comprehensive reconstructive oral procedures, while at the same time minimizing invasiveness and discomfort for the patient. Objet Geometries Eden500V™ 3D Printing System provided an ideal solution, as it enabled the team to quickly create multiple, large-scale anatomical models that would help them to identify the most suitable solutions for each case. Surgical positioning templates, fabricated on the anatomical model surgical simulation, assisted with pre-surgical planning and provided the desired intra-operative positioning verification. These templates also facilitated the harvesting of the exact size and shape of the required bone graft.

“The surgical positioning templates play a crucial role in pre-surgical planning, allowing for shorter surgical time and exposure as well as less manipulation of transplanted bone graft tissues,” explains Jon P. Bradrick, DDS, Associate Professor, Director, Division of Oral & Maxillofacial Surgery, MetroHealth Medical Center. “I was particularly impressed with the model fabrication’s quick four-day turnaround time. This is the finest example of technology driving the globalization of health care.” He added.

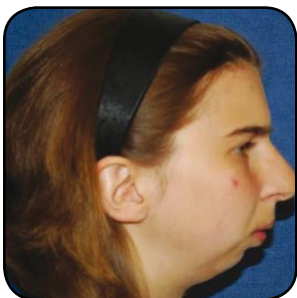




Precise models ideal for surgical planning, other medical applications

Based on Objet's innovative PolyJet™ technology, the Eden500V 3D Printer provides an easy to use, fast and clean solution for the precise building of medical models. Models produced on the Eden500V are durable, with exceptionally fine details and an outstanding surface finish – all necessary for ensuring the high degree of accuracy required by the MetroHealth surgical team.

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Objet models are widely used in many medical modeling applications because of their high accuracy, fast build time, and ease of model sterilization. The models are also highly resilient, enabling drilling and fixing of screws and model plates in a similar way to human bone tissue. Furthermore, support removal that preserves thin and delicate structures, as well as the lack of an after-production step that can degrade the model surface, make it possible to build complex models of human anatomical structures even more delicate than bone, such as blood vessels.



"Due to the complexity of the procedures we perform, it's imperative that the models we create are identical to the actual settings in which we'll be operating. The high resolution provided by the Eden 500V allows this to happen," explains Dr. Bradrick.

ABOUT OBJET

Objet Ltd., is a leading provider of high quality, cost effective inkjet-based 3D printing systems and materials. A global company, Objet has offices in North America, Europe, Japan, China, Hong Kong, and India.

Objet's 3D printing systems and 3D printing materials are ideal for any company involved in the manufacture or design of physical products using 3D software or other 3D content. Companies using Objet's solutions can be typically found in [sectors](#) such as consumer goods & electronics, aerospace & defense, automotive, education, dental, medical and medical devices, architecture, industrial machinery, footwear, sporting goods, toys and service bureaus.

Founded in 1998, the company has thousands of [customers](#) worldwide including a substantial share of the relevant Fortune 100 and Fortune 500. Its award-winning technology (12 awards in 5 years) is based upon over 110 patents and patent pending inventions.

Objet's advanced 3D printing systems and range of over 60 [materials](#) enable professionals to build prototypes that accurately simulate the true look, feel and function of an end-product, even complex, assembled goods.

The [Objet Connex™](#) line of multi-material 3D printers features the world's only technology to simultaneously jet 2 materials. With this, users can print many different materials into a single part and print various mixed parts on the same build tray. Users can also create advanced composite materials, or [Digital Materials™](#) featuring unique mechanical and thermal properties. Objet's range of over 60 [3D printing materials](#) simulate properties ranging from [rigid to rubber-like](#), [transparent](#) to opaque and standard to [ABS-grade engineering plastics](#), with a large number of in-between shore grades and shades.

[Objet's 3D printers](#) are available in a range of form-factors, from cost-effective desktop 3D printers ideal for entry-level professionals all the way to industrial-scale multi-material machines for front-line designers and top manufacturers. Objet's 3D printers feature the industry's highest-resolution 3D printing quality, based on 16-micron (0.0006 in.) super-thin layering, wide material versatility, office friendliness and ease of operation.

For more information, visit us at www.objet.com, and for more about 3D printing industry-related news, business issues and trends, read the [Objet Blog](#).

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