

Empowered By Cone Beam – A Surgical Case Report

By Steven Guttenberg, DDS, MD

Cone Beam technology is replete with opportunities—for patient education, and for greater insights into treatment planning, and for precise, individualized care. This case study shows how a 3-D scan empowered me to help a patient retain quality of life, even in the face of a serious diagnosis.

The patient in this case study was referred to me by her general dentist who discovered an unusual spot on a 2-D x-ray. The patient was asymptomatic. My suspicion, that the spot was an ameloblastoma, an aggressive odontogenic tumor, was confirmed by a biopsy. An i-CAT® scan revealed the very destructive nature of the tumor and the resulting expansion and breakdown of the jaw (Fig. 1). All of the data provided by the scan guided me through an innovative treatment plan and gave me the confidence to carry it out to its successful completion. Because of the destruction, a portion of the bone needed to be resected. The scan provided the necessary measurements to calculate for resection. The 3-D images also gave me the tools to create a stereolithic model and prepare the bone plate for easy insertion into the defect at the time of surgery.



Fig. 1 Ameloblastoma in i-CAT

To begin the process, I transferred the 3-D scan information to a CD and sent it to a company that transforms the scan into a 3-D stereolithic model of the patient's jaws (Fig. 2).



Fig. 2 Stereolithic model

Then, I simulated the surgical plan on the plastic model (Fig. 3), and then used the same model to prepare a metallic temporary replacement jaw and temporomandibular joint (Fig. 4).

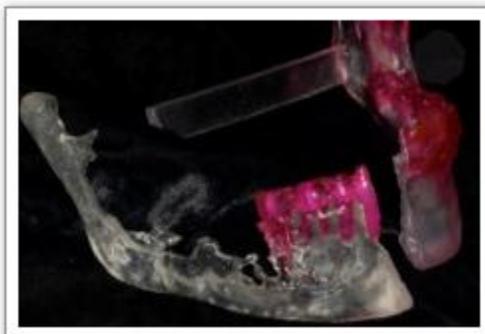


Fig. 3 Simulated surgery



Fig. 4 Adapting reconstruction bar

I entered the operating room for the actual surgery, as prepared as possible. I confidently anticipated a successful surgical outcome, knowing that the process would be quicker, easier, and yield no surprises. The actual surgery efficiently and effectively reflected that which I did on the model at my desk in the office (Fig. 5, 6, 7).



Fig. 5 Reconstruction bar in situ and on model

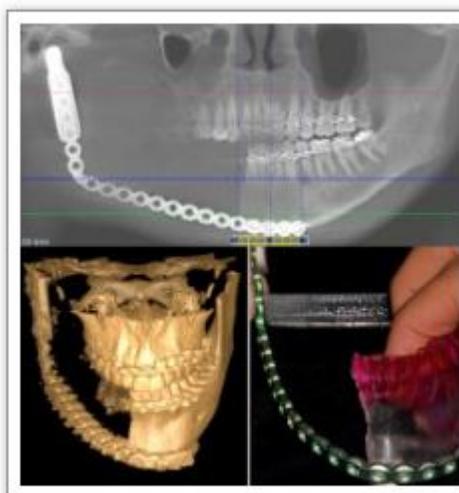


Fig. 6 Post-op i-CAT scan and pre-op model

In cases where pathology involves the breakdown of jawbones, visualizing the situation beforehand is a tremendous asset. With a scan that is virtually identical to the patient's true dental and jaw anatomy, a successful outcome is much more probable. Besides the scans themselves, Cone Beam's capability for integration with guided surgical techniques and other state-of-the-art applications increases my horizons and my opportunity to add a new dimension to my capacity as a surgeon.



Fig. 7 Surgical specimen and model

From the mundane to very unusual dental conditions, correct treatment follows making the correct diagnosis—and imaging is an integral part of the process. The cone beam scan is very significant in uncovering anatomical conditions that would not be apparent on a 2-D X-ray. When preparing for maxillofacial surgery, accuracy is imperative. CBCT provides detailed, precise data, in a 3-D format that can be rotated 360 degrees, enlarged, and sliced in any direction. Most of all, having an i-CAT allows me to continue learning, and as a result, to offer treatment options individualized for my patient's specific needs. Having a 3-D scan makes me a more accurate surgeon, and allows me to contemplate procedures that, without such radiographic images would be risky at best.



Dr. Steven A. Guttenberg

Bio

Dr. Guttenberg is an oral and maxillofacial surgeon, practicing the full scope of his specialty in Washington, DC where he is Director of the Washington Institute for Mouth, Face and Jaw Surgery. He is a Diplomate of the American Board of Oral and Maxillofacial Surgery and a Fellow of the American Association of Oral and Maxillofacial Surgeons and of the American College of Oral and Maxillofacial Surgeons, of which he is a Past-President. Dr. Guttenberg is a member of the teaching staff at the Washington Hospital Center and is the chairman of its Oral and Maxillofacial Surgery Residency Training and Education Committee. He is a frequent lecturer throughout the United States and abroad, as well. Dr. Guttenberg has written numerous scientific articles and book chapters which have been published in dental and medical literature.