QUICK TECHNIQUE

Utilizing the i-CAT System to Treatment-Plan Obstructive Sleep Apnea

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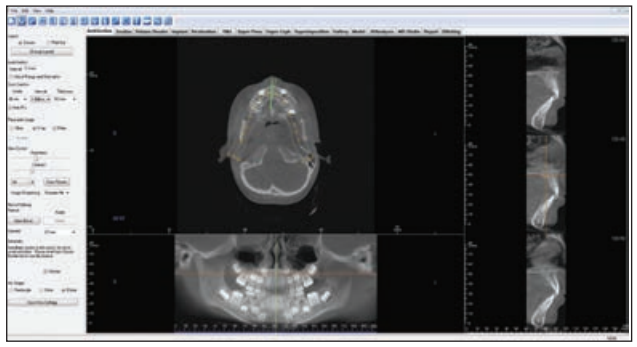
Breathing is a function of life that we often take for granted. We all breathe, all day, every day, and as a function of the craniofacial anatomy, the airway has become a focus for my orthodontic practice. A hazardous medical condition that involves a restricted airway is Obstructive Sleep Apnea (OSA). This disease causes people to stop breathing at certain intervals during sleep, but the dangers do not stop there. People with OSA have the potential risk of developing cardiovascular disease, renal disease, diabetes, depression, and other illnesses for which OSA is a contributing factor. Because of the potential for changing my patients' lives for the better, I now examine airways to check for their size and possible obstructions. The i-CAT 3D cone beam imaging system and the included Tx STUDIO software are an integral part of the airway evaluation, when I examine the size of the dynamic space of the pharyngeal airway. With these software tools and 3-D scans, I can share the 3-D views and measurements with an ENT, and we can plan together to help eliminate the anatomical issues that could potentially develop into OSA in adulthood.

The 3-D diagnostic session consists of photographs and the appropriate CBCT scan taken on my i-CAT FLX system. The 3-D scans, analyzed within Tx STUDIO software, cover the area of interest and offer me comprehensive information that is not attainable with 2-D imaging methods. I can select scan size and resolution that is appropriate for each patient. The i-CAT also offers me lower dose options when extreme detail is not required. For airway cases, I usually capture a scan with a 16- x 13-cm field of view, 4.9-second exposure time. After capturing the scan, I use Tx STUDIO tools to review the images and examine the region of interest.

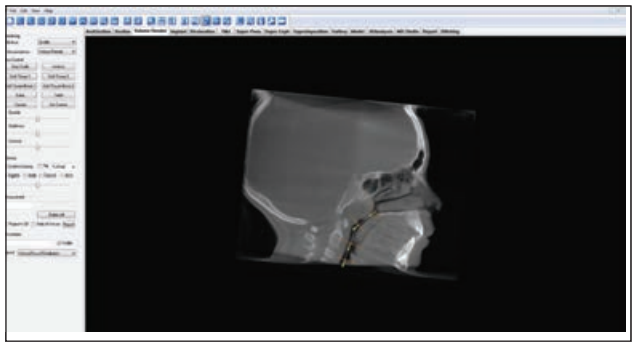
I can identify the superior and inferior limits of the airway with the airway measurement tool in the treatment-planning software, reconstruct it in a few seconds to evaluate the shape, and view any areas of obstruction such as the adenoids and tonsils. One of the best parts about 3-D imaging is that clinicians can study the airway region, complete with bone, teeth, and soft tissue, from all angles and with different anatomical structures to diagnose any potential obstructions. I also have the option of measuring cross-sectional areas by the slice to identify constricted airways. Within the Tx STUDIO software, the volume for the airway region can be calculated, isolated, and color-coded.

When treatment planning, I can look at the airways, sinuses, TMJs, skeletal relationships, alveolar housing, and of course the teeth. Once an airway issue is determined, whether the patient needs orthognathic surgery to advance the mandible or other treatment, the key is to catch the problem early to encourage healthy growth of the craniofacial complex and reduce future health conditions.

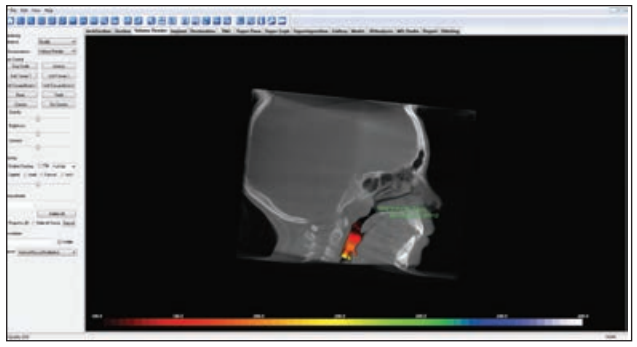
Procedure



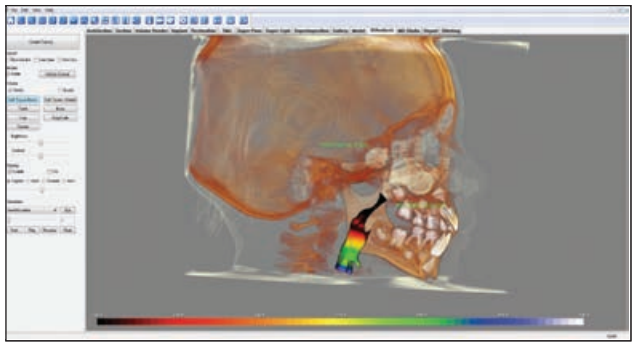
1. Acquire the appropriate scan and allow the data to build within the treatment-planning software.



2. From the 3-D rendering, plot the airway by clicking on the highest and lowest point where calculation is needed. Then click on Airway Measurement tool to calculate the airway volume.



3. The volume for the region is identified as airway, then calculated, isolated, and color-coded; the darker the area, the more constriction.



4. Clinicians can study the region categorized as the airway from all angles and with different anatomical structures to diagnose any potential obstructions, seen here with bone, teeth and soft tissue.

Dr. Quintero received his dental degree from the University of Pittsburgh and his orthodontics degree from the University of California at San Francisco. During this time, he also received a master's of science degree in oral biology. He has served as national president of the American Association for Dental Research-SRG, published more than 14 articles in peer-reviewed scientific journals, and currently lectures extensively both nationally and internationally. An immediate past-president of the South Florida Academy of Orthodontists, he is in private practice in South Miami, Fla, and has taken over the orthodontic practice of the late Dr. Lindsey Pankey, Jr.