

Dental Specialists Utilize CBCT and Secondary Findings Allow for Diagnosis of Obstructive Sleep Apnea

Randi Minetor



Terry A. Giangreco, DDS

Six-year-old Peter (not his real name) faced an uncommon number of challenges for a boy of his age, especially in comparison to his older brother, John. Peter was smaller than John had been at his age, and he still wet the bed on occasion. He had difficulty sleeping, often sweating profusely during the night, and at a young age, he had developed a habit of breathing through his mouth.

Despite his restless sleep, Peter seemed full of energy during the day, often struggling to sit still in school. His teachers sent notes home to his parents about his “hyperactivity,” making his parents wonder if he required medication for attention deficit hyperactivity disorder (ADHD). In what seemed like an unrelated problem, Peter had trouble eating any meals unless they were cut up into very small pieces. Protein-rich dense foods were even more difficult to eat, leading him to leave these foods on his plate and gaining him an additional label as a finicky eater.

A number of doctor visits and referrals led Peter’s parents to Terry A. Giangreco, DDS, orthodontist and a partner in Get It Straight Orthodontics, with offices in Pittsford, Rochester, and Macdeon, NY. Giangreco listened to the list of symptoms,

asked questions, and decided that Peter would benefit from dental cone beam computed tomography (CBCT), an imaging technology that provides insights well beyond conventional X-rays.

Dental CBCT is used in situations where regular dental or facial X-rays cannot provide enough information to understand a complex of symptoms. In a low-radiation 4.8-second scan, it generates 3-D images of the structure of the upper and lower jaw, soft tissues, nerve paths, and craniofacial bone. It also reveals issues relating to the patient’s airway, by measuring the most constricted part of the airway in square millimeters (mm²).

“When we treat children, we think, what other ways can we affect their health?” said Giangreco. “We look at the airway on almost all of our patients now and say, ‘What can we do to make it better?’”

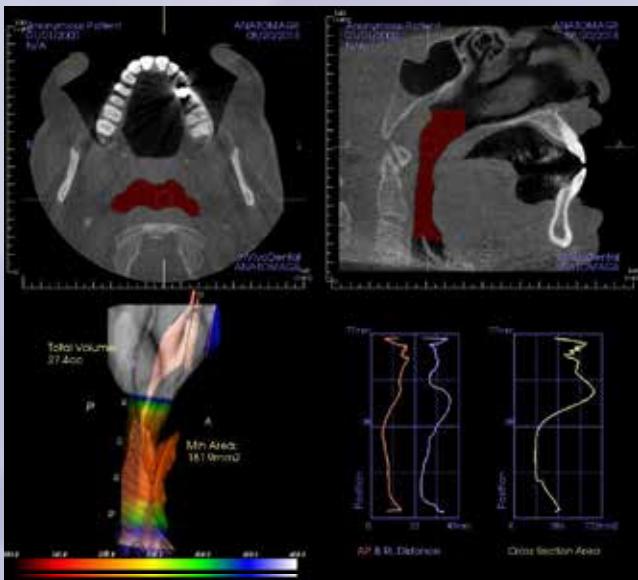
Peter’s CBCT revealed a multitude of reasons for his dis-

“This is about opening physicians’ eyes,” said Giangreco. “It’s easy to get used to doing the same thing all the time, but it’s good when you see something new that shows us something else. CBCT has been a game changer.”

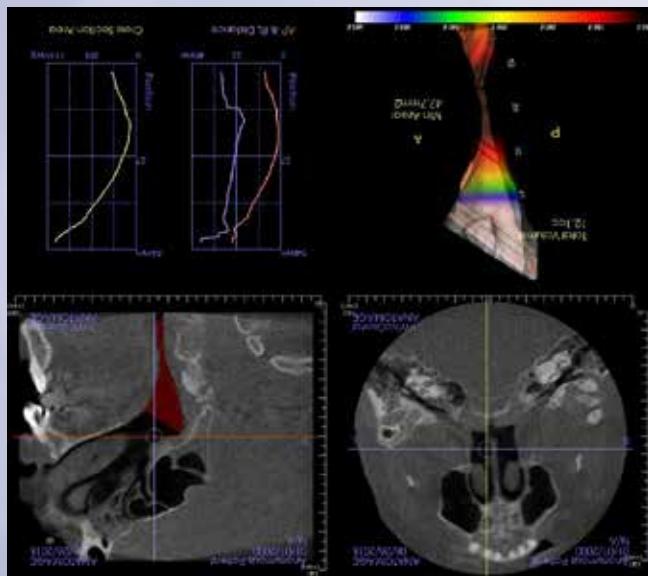
parate symptoms. His tonsils and adenoids were so enlarged that they interfered with his ability to breathe, especially in sleep. “The image showed a minimal axial airway of 87 mm²,” Giangreco said. “This would put him in the probable moderate sleep apnea category structurally, due to the obstruction.”

Sleep apnea in a six-year-old? “Way more children have sleep apnea than people realize,” he said. “Although these numbers are not a true diagnosis of obstructive sleep apnea (OSA), it shows the likelihood due to the severity of the obstruction.”

Children with underdeveloped maxillary or mandibular arches are likely to have OSA, as the jaws push back the tongue and close the airway. If this is the case, they may not get the sleep they need, leading to exhaustion during the day—



This 60 year old healthy male patient (call him Tom) came in for an implant consultations to replace one tooth missing in the mandibular left side. His teeth were all appropriately positioned in the arch and his airway is healthy (compare to the previous)



This 89 year old male patient (call him Fred) came in for a consultation for dental implants to replace all his missing posterior teeth. A CBCT was taken and Dr. Lester evaluated the implant sites in the maxillary arch and also his severely constricted airway. Once we showed the patient the CBCT (utilizing Anatomage software, San Jose, California) it confirmed his OSA and why he had trouble breathing while laying down and difficulty swallowing. He was then referred for a sleep study and for a consultation with a restorative dentist for rehabilitating his occlusion.

which, in turn, can lead to irritability, acting out, and an eventual diagnosis of ADHD. In the most severe cases, according to the journal Sleep Review, these children may be at risk for life-threatening health issues including sudden cardiac death, because of a lack of oxygen during sleep.

The impact on a child's overall health can be far-reaching, said Giangreco. "Growth hormone is produced during deep sleep, so growth is often impeded. One study even says that when sleep apnea is addressed, the child's IQ goes up by as much as eleven percent."

The revelation that Peter's tonsils blocked his airway, an issue compounded by a narrow upper and lower jaw, led to a clear course of action for the boy's medical team. They removed his tonsils and adenoids, and Giangreco completed an orthodontic expansion of his jaws. "The orthodontic expansion makes more room for the tongue to be in a forward position," he said. "This moves the back of the tongue away from the throat, thus opening up the airway. Often, but not always, these patients have a crossbite of the back teeth due to the extreme narrowness of the upper jaw."

This early intervention would help Peter's health in the long run. "This is interceptive orthodontics: guiding the growth of the jaws, instead of waiting for all the adult teeth to come in," Giangreco said.

As a result, all of Peter's symptoms were alleviated, he said. "Peter had more restful sleep, the bed wetting stopped, and hyperactivity during the days stopped. His eating habits changed almost immediately, and a growth spurt occurred."

Giangreco sees cases like Peter's every day, he said, and a simple CBCT scan can reveal the problem—but parents and pediatricians alike resist the idea that the child may have OSA. "I'll talk to parents and they'll tell me that they know their child is sleeping well because they're off-the-wall hyperactive during the day, but this is a common symptom of apnea."

Studies have even shown that sleep apnea can be a significant factor in Tourette syndrome. "Every one of my patients with Tourette's has an airway issue," he said. "Their tics get much worse because of sleep apnea."

Part of the resistance, he said, comes from the fact that many health insurance providers do not reimburse for CBCTs—or if they do, the reimbursement amount is negligible. Giangreco solves this by incorporating the scan into his initial consultation, for which he does not charge the patient. "I'm giving them valuable information, and they can use it as they like," he said. "Eventually insurance will pay for this, but for now, this is a solution."

CBCT and Adult Periodontal and Dental Implant Practice For Dr. Mary Ann Lester, a board certified Periodontist and Dental Implant surgeon at Perio Health Partners in Brighton, NY, using CBCT with adults has become part of a broader plan to improve her patient's overall health. She sees Adult patients on a daily basis who have lost multiple posterior teeth because of gum disease and dental decay. Rehabilitation of a bite collapse with dental implants involves multiple planning steps in partnership with other dental specialists such as orthodontists and restorative dentists. Dr. Lester has been using her own CBCT (ICAT tradename) for 13 years and analyzes the results in the consultation process. She reviews the CBCT scan with the patient which reveals the structure of the jaw for



Mary Ann Lester, DDS

the future implants and the patency of the airway before making any recommendations. If the airway is constricted most likely they have OSA (obstructive sleep apnea). Adult patients with chronic OSA are at risk for HBP, congestive heart failure, worsening of chronic disease such as diabetes and COPD (Chronic Obstructive Pulmonary Disease) so it is important to partner with the patient on the health implications.

"I usually send patients to an Orthodontist first because teeth lose bony support due to periodontal disease and migrate pathologically out of their original position.... also some patients may never have had orthodontic treatment when they should have as a child....so they may have skeletal issues that were not corrected." When choosing a specialist partner to work with "I want to collaborate with someone who is of the same mindset", she said and Dr. Giangreco is one of the Rochester area Orthodontists that is choose to work with regularly".

Adult patients may resist the idea of going to an Orthodontist, but Lester is firm about the need for this intervention. "I say to them, think about this what holds your jaw up? You lose your molars, what happens?" She said "the posterior support is gone, the front teeth start splaying out and the tongue has nowhere to go but back constricting the airway. This makes sense to them. This is especially important in patients that have Class II occlusion (an overbite) because their lower jaw is already small compared to the upper jaw putting them at greater

risk for OSA. Another important guideline is that dental implants have to be placed in the optimal position because once integrated in the jaw they cannot be moved like natural teeth can. Teeth need to be repositioned to the appropriate position first to allow for proper placement of the dental implants in the jaws and the new dimension of the bite can better accommodate the tongue which in turn alleviates the airway issues.

I tell my patients that they have to get their overall health on track before we can proceed. Once everything is in the right place then I can put the dental implants in." With the CBCT results in hand, Dr. Lester can guide her patients through the dental implant process that will lead to a healthier mouth, while improving their overall health. Her mission statement is "Smile Healthy, Be Healthy"

A checklist for adult sleep apnea

- Loud or frequent snoring
- Silent pauses in breathing
- Daytime sleepiness
- Fatigue
- Morning headaches
- Memory loss

Risk factors for adult sleep apnea

- Loss of multiple posterior teeth without restoration
- Excess weight
- Hypertension
- Male gender
- Class II occlusion (weak lower jaw)
- Obesity

What lack of OSA treatment can lead to

Worsening of chronic diseases such as diabetes, congestive heart failure, hypertension, stroke and depression

A checklist for childhood sleep apnea

Giangreco and Lester see CBCTs that reveal sleep apnea in children as a result of a set of symptoms that may not be obvious to all pediatricians:

- A narrow jaw
- A short lower jaw with a larger upper jaw
- Large tonsils and adenoids
- Multiple cases of strep throat
- ADHD symptoms, especially hyperactivity
- Allergies
- Chronically swollen sinuses
- Septal defects
- Bedwetting
- Clenching and bruxism
- Chronic ear infections

Randi Minetor is a medical journalist and freelance author based in upstate NY.