ROB ROBERTS | KCBJ

Dr. Prabu Raman (right) says his new imaging system costs about one-third less than medical scanners, generates 1/50th the radiation of a CT scan and results in better treatments for patients. Technician Melissa McAninch demonstrates.

New tool offers jaw-dropping images

Digital scans let dentists conduct 'virtual surgery'

BY ROB ROBERTS | STAFF WRITER

Dr. Prabu Raman is a dentist, not a psychiatrist.

But he has a clear picture of what's going on in his patients' heads.

That's because Raman's practice, the Raman Center for Advanced Dentistry, is the first in Kansas City to acquire an i-CAT Cone Beam 3-D Imaging System.

Manufactured by Imaging Sciences International in Hatfield, Pa., Raman's system is one of about 500 now producing three-dimensional computed tomography scans, or computerized X-ray series, in U.S. dental offices and institutions.

The University of Missouri-Kansas City School of Dentistry also has an i-CAT, which advances dental imaging far beyond traditional bitewing X-rays, for which patients bite on a plastic film holder and don lead aprons.

Raman said the i-CAT is on par with new medical imaging advances such as 64-slice CT scanners and 3 Tesla magnetic resonance imaging machines.

"But i-CAT scans are about a third of the cost, and they generate only about 1/50th of the radiation you receive from medical CT scans," Raman said, "because in one sweep, you're done."

Unlike the medical scanners, which use fan-beam technology, the cone-beam technology of the i-CAT allows the patient to be scanned in one 20-second sweep.

"And a few minutes later, when the virtual head is here in the computer, we can slice it and dice it any way we want to," Raman said during a demonstration.

Another advantage is that the i-CAT is the first CT scanner that allows images to be captured while the patient is in an upright position – an important

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feature for doctors, like Raman, who specialize in diagnosing and treating temporomandibular joint disorders.

Raman said one thing that motivated him to plunk down close to $200,000 for the i-CAT was his interest in radiography. Before earning a dental degree at UMKC, he earned degrees in physics and radiology and, during the 1970s, helped run one of the world's first CT scanners at Truman Medical Center-Hospital Hill.

The biggest motivator, however, was the ability the i-CAT gives him to make diagnoses and perform "virtual surgery in advance" without a scalpel.

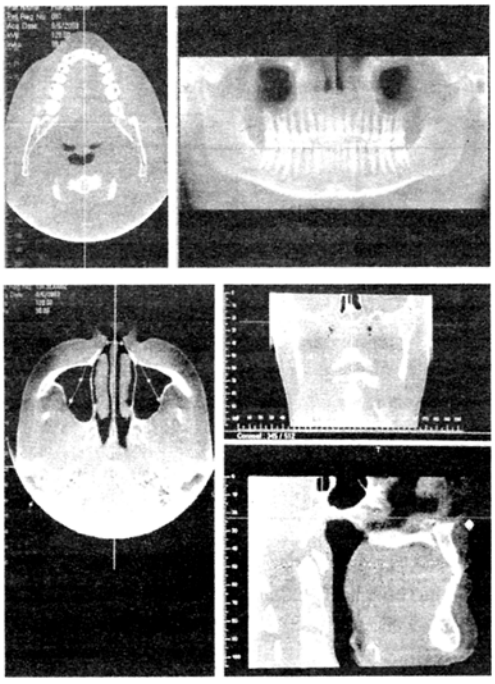
"I like to say, 'A good carpenter measures twice and cuts once,'" Raman said.

Dr. John Flucke, a Lee's Summit general dentist whom Raman succeeded as president of the Greater Kansas City Dental Society on Dec. 1, said the "virtual surgery" feature is particularly helpful in the placement of dental implants.

"One of the reasons I don't place (implants) is that doing so requires knowing exactly where to put them" to maximize depth and avoid drilling through the jaw or into nerve canals, Flucke said.

"I think this revolutionary technology will open the implant business to more general dentists," he said.

That doesn't mean, however, that all dentists are going to run out and buy i-CATs, said Dick Greenan, who distributes iCATs through Imaging Systems Inc.



RAMAN CENTER FOR ADVANCED DENTISTRY

The i-CAT captures a three-dimensional image of the patient's neck and head.

Like Raman, he said, many iCAT owners are defraying their costs by performing scans for fellow dentists and ear, nose and throat specialists.

"These machines cost what the average dentist spends to set up his whole practice," Greenan said. "So unless they're doing a lot of TMJ (temporomandibular joint) work or dental implants, it's a bit pricey. But dentists can make money with this machine by bringing in new patients who want the latest technology and best outcomes."

Medical insurance covers most iCAT scans, Greenan said. Although they're usually not covered as part of dental implant procedures, the $300 to $500 cost is a small price to pay for optimal placement without any cutting, he said.

With an i-CAT image, Raman said, 80 percent of implant posts can be screwed through a small hole punched in the gum.

"And it's only going to get better," Flucke said of dental imaging. "I think one of the things you'll be able to do down the road is 3-D orthodontic imaging. You'll be able to show a 13-year-old with braces, 'Here's how we envision you looking when you're 16.'"

Greenan, who has written journal articles and textbooks on dental implants, orthodontics and TMJ radiology, doesn't foresee big changes in dental imaging hardware in the near future.

"But we're going to see a quantum leap in the software, which will allow us to see more and with better detail," Greenan said. "Right now, all we can see is the hard tissue, the bone. But soon there will be software developed that allows us to see soft tissue, as well."

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