

Science Times

The New York Times

THE NEW YORK TIMES, TUESDAY, DECEMBER 5, 2000

A Stealth Substitute for Braces, Designed Only for Adults

By CLARA HEMPHILL

Many adults with crooked teeth are reluctant to undergo orthodontic treatment because of the embarrassment of wearing a mouthful of metal braces. Now, a new orthodontic device promises to straighten mild cases of overcrowding or improperly spaced teeth almost invisibly.

The new product, called Invisalign, is a set of extremely thin, transparent, U-shaped plastic devices called aligners that are molded to fit precisely over each tooth. A computer generates a 3-D model of the patient's current tooth positions, as well as a model of where the teeth should be, based on an orthodontist's prescription.

Patients can view a videotape computer simulation of what their teeth may look like. The computer then designs 20 to 30 aligners, each with just a slightly different shape, to move the teeth gradually into place. Each aligner is worn for two weeks, and is then replaced by the next in the set.

Patients wear the appliances almost constantly, removing them only to eat and brush their teeth. The whole process takes 12 to 20 months.

"It's amazing what computer graphics technology can do," said Kelsey Wirth, president of Align Technology Inc., the Santa Clara, Calif., company that developed the Invisalign system.

"Even five years ago, this would have been prohibitively expensive," Ms. Wirth said. "Ten years ago it would have been impossible."

The Invisalign system can be used only on adults who have a full set of permanent teeth. It can correct only minor problems.

In addition, it costs about 50 percent more than conventional braces, or about \$4,700 to \$6,700 in and around New York City. Some orthodontists maintain

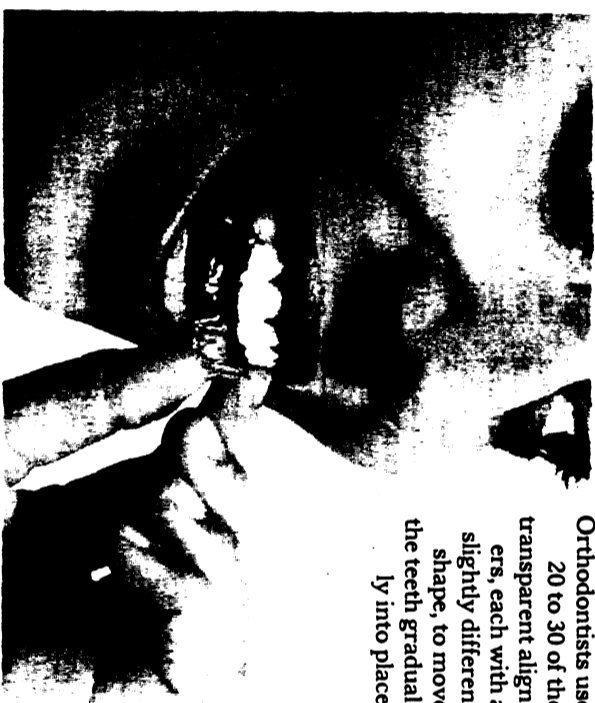
that it takes longer than conventional treatment. Still, the response from some patients, and their orthodontists, has been enthusiastic.

"It's like, wow!" said Christina Hong, 24, a computer technician and patient of Dr. Frank Celenza, an orthodontist with a practice on the Upper East Side of Manhattan. "I used to tell people I just got braces and pop them out and show them because you can't see them."

"I had traditional braces from the time I was 11 to when I was 13. I hated them," Ms. Hong said. "The wires would give me sores. With these, I can feel pressure, but it's not as painful. My gums don't hurt."

"Were having a ball with Invisalign," Dr. Celenza said. "It's a neat system. It's not a cure all, but for minor cosmetic improvement it's great."

Another patient, Jennifer Ravalli, 20, said the small adjustments made possible by the new product have changed the whole look of her face. An undergraduate at New York University, Ms. Ravalli said she didn't want to be dating with conventional braces.



Orthodontists use 20 to 30 of the transparent aligners, each with a slightly different shape, to move the teeth gradually into place.

Most important, she is training to sing professionally, and the Invisalign devices, which fit tightly over her teeth, don't interfere with her voice lessons as conventional braces might.

"It's very high-tech and cool," said Dr. Jennifer Salzer, Ms. Ravalli's orthodontist, who practices in Manhattan.

Orthodontists who have used the system caution that it can be used only for small corrections and cannot, for example correct a pronounced overbite. "They don't want you to make a shift of more than two millimeters — that's the thickness of two dimes," said Dr. Michel vanBergen, a San Francisco orthodontist.

While patients who have used the system successfully are enthusiastic, Dr. vanBergen warned that there is a potential for abuse if patients choose minor cosmetic corrections while ignoring more serious underlying problems — like poor jaw functioning — that can be corrected only by conventional braces or surgery.

Align Technology is aggressively marketing Invisalign, both to orthodontists and to the general public.

The company has begun a \$38 million advertising campaign to encourage consumers to ask their dentists about the product.

In addition, the company has begun offering training seminars for orthodontists across the country.

Since Invisalign came on the market in July 1999, some 6,000 patients have used the system and nearly half of the 8,500 orthodontists in this country have been trained in how to use it, company officials said.

At a recent training at New York University's School of Dentistry, a time-lapse video projected on a movie screen showed crooked teeth moving into alignment, almost as if by magic.

Dr. Eric Kuo, the director of product development for Align

Technology, demonstrated to orthodontists how to make thin rubber casts of teeth to send to the company, which then creates the 3-D computer images and plastic appliances.

He also outlined the product's limitations to the class of several dozen faculty members, students and practicing orthodontists. Patients with inflamed gums, for example, cannot use Invisalign. Young adolescents — whose jaws are still growing — cannot use

Debating the merits of braces you can hardly see.

Invisalign. Although most adolescents have a full complement of teeth by the time they are 15, some orthodontists prefer to wait until patients are 18, or mature enough to wear the devices consistently.

Dr. Kuo warned that the appliances might involve more time to make the corrections than originally anticipated, and that the final appearance might not precisely match the computer imaging in the high-tech videos that are shown to patients.

Dr. Laurance E. Jerrold, program director of postgraduate orthodontics at New York University's School of Medicine, said Invisalign seemed to work somewhat better than the removable devices that preceded it — retainers, positioners and spring aligners. But he said that Invisalign was less precise than conventional braces, more costly and involved more time for correction.

"The only reason that this is a better mousetrap is that it's invisible," said Dr. Jerrold. "It doesn't give you the same degree of control or the precision of conventional braces. Does it take longer? Yes. Is it more expensive? Yes. But for some people, it's worth it."