

MEDICINE

A less-invasive scoliosis remedy

The new surgery saves muscle, but long-term results are still out.

FORD VOX

Today's surgeons can nick out your gallbladder via your belly button and excise your thyroid gland without cutting your neck. Now some doctors have added one of recent history's most grueling operations to the ranks of minimally invasive surgeries.

These surgeons say there is a safer way to surgically correct scoliosis — curvature of the spine — than the current ordeal, which requires opening an incision that may extend from the shoulders to the pelvis and then stripping back muscles off the vertebrae to reach the bones that must be fused. Multilevel fusions — those that involve shoring up vertebrae all along the spine — are often seven-hour marathons followed by a stay in intensive care.

There is some debate about whether surgery is a wise procedure for scoliosis, and most often the condition is treated with bracing when it begins in childhood or adolescence. Because adults have skeletally mature spines, bracing can improve pain but won't really correct the problem. In children and adults, surgery usually isn't considered unless the sideways curve has reached 45 degrees or more, although sometimes surgeons intervene earlier if symptoms such as pain or shortness of breath develop.

Brenda McInnis of Midland, Mich., was diagnosed at a middle-school screening and lived with scoliosis much of her life. Though she was happy that her doctor and parents hadn't forced her to wear a brace, by age 47, her midback curve had grown to 50 degrees from less than 20. A compensating curve in her lower back sent severe pain into her hips. Most days she could tolerate only two hours at her job as a cashier in a hospital cafeteria. Eventually

she had to use an inhaler to breathe.

In November, McInnis became one of fewer than 100 patients at four pioneering centers nationwide to have minimally invasive surgery to correct her scoliosis. Dr. Frank La Marca, a University of Michigan neurosurgeon, inserted dilating tubes through a series of small incisions up and down her spine. The tubes spread apart her muscles rather than ripping through them, providing a path for screws drilled into the sides of every vertebrae composing the curve.

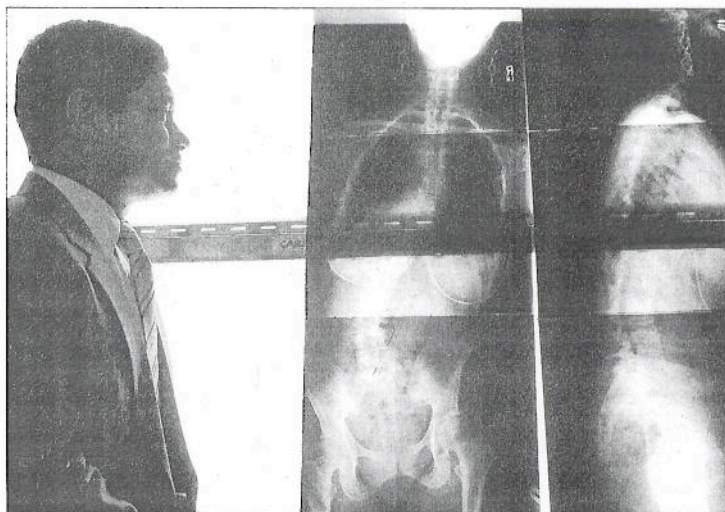
As in the open procedure, metal rods were guided through the heads of the screws along both sides of the spine, straightening it. The screws and rods were placed without direct visualization, using CT and fluoroscopy (real-time X-ray) to guide the surgical team.

The technical demands of this kind of surgery may add an hour or more to operating room times, which can increase the costs. Proponents think it is worth it.

"I see a lot of patients who've had big surgeries done," La Marca said. "The muscle tissue is horrible, de-vascularized, de-nervated, causing back pain, and what little muscle is left is very fatigued and left in spasm. We can't do anything for these patients and they are miserable." The new procedure still fuses a curved spine straight, using the same bone graft, and similar screws and rods, but getting to that point, he says, is ultimately less damaging to the patient.

Dr. David Polly, chief of the spine service in the Department of Orthopaedic Surgery at the University of Minnesota, acknowledges the excitement surrounding minimally invasive surgery, but points out that so far, doctors have demonstrated only short-term results, such as shorter hospital stays, less pain, decreased blood loss and quicker recoveries.

Polly, who also serves on the board of the Scoliosis Research Society, wonders whether



GENARO MOLINA/Los Angeles Times

PIONEER: Dr. Neel Anand of the Cedars-Sinai Spine Center in L.A. is a proponent of minimally invasive surgery to correct scoliosis and is studying its long-term effects.

there will be any long-term benefit to sparing muscle tissue. Once the spine is fixed straight, it won't bend where the metal rods are in place, he points out, "so we don't know if it's important or not" to preserve muscle.

The data are just arriving on longer-term, post-operative effects of minimally invasive scoliosis surgery. Dr. Neel Anand, director of orthopedic spine surgery at Cedars-Sinai Spine Center in L.A., provided The Times with data last week that he will present at the SRS' international meeting next month showing that a study group of 24 patients who had curves averaging more than 42 degrees maintained deformity correction one year after surgery to an average of 6.5 degrees. Anand says these findings show "we absolutely can maintain good correction and get good correction." (Anand is a paid consultant for Medtronic and receives royalties for his contributions to the design of the screws used in the minimally invasive surgeries.)

The only published study to date on the technique is also Anand's, a case series of 12 adult patients with symptomatic lumbar scoliosis who had two to eight levels fused. For those patients, the only significant short-term complication was hip flexor weakness, which resolved within six weeks.

Anand says his patients usually go through a number of treatments before trying surgery, and if they haven't he will send them to try various options — such as physical therapy, epidural injections or acupuncture — before resorting to surgery.

McInnis tried symptomatic treatment first, including spinal injections and painkillers.

At work full-time since January, McInnis stands 1 1/4 inches taller now and double-takes when passing a mirror. "If people didn't try new procedures, we'd never go anywhere in life," she said. "We wouldn't be doing spinal surgeries at all, because people would be too scared."

health@latimes.com

Adult-onset scoliosis facts

Bring up scoliosis and many Americans will imagine a childhood spinal curve that corrects only with unsightly, unwieldy and sometimes stigmatizing bracing. The adolescent form, still often treated with bracing, has no known cause, while severely disabling infantile forms have numerous genetic links.

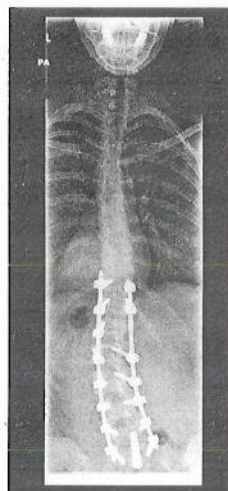
Up to 3% of adolescents have scoliosis, defined as a curve of at least 10 degrees, and about 1 in 2,000 children have a curve large enough to consider surgery. Adult scoliosis, if not severe, is typically found incidentally on routine X-rays taken for other reasons (it can be seen on chest and abdominal films, for example).

In some cases, a patient may have had undetected scoliosis since childhood. A slight adolescent curve can continue to worsen in adulthood, aided by the normal spinal degeneration we all experience, and accelerated by the abnormal forces created by the curve.

Alternatively, even otherwise healthy middle-aged adults can develop *de novo* degenerative scoliosis — new onset scoliosis. One study, published in the medical journal *Spine* in 2005, examined 75 adults older than 60 who had no history of back problems. X-rays showed that 68% had curves of 10% or more.

The bend in the spine can worsen due to gravity and age, with second and third curves often forming as the body tries to remain upright. In adults, curves can form as the discs between vertebrae collapse more on one side, causing segments of the degenerated spine to lean. Longer life spans and sedentary lifestyles have increased the rate of adult-onset scoliosis.

— FORD VOX



Dr. Neel Anand

CORRECTION: Metal rods are guided through screws drilled into the vertebrae, straightening the spine.