

Designing better spinal support

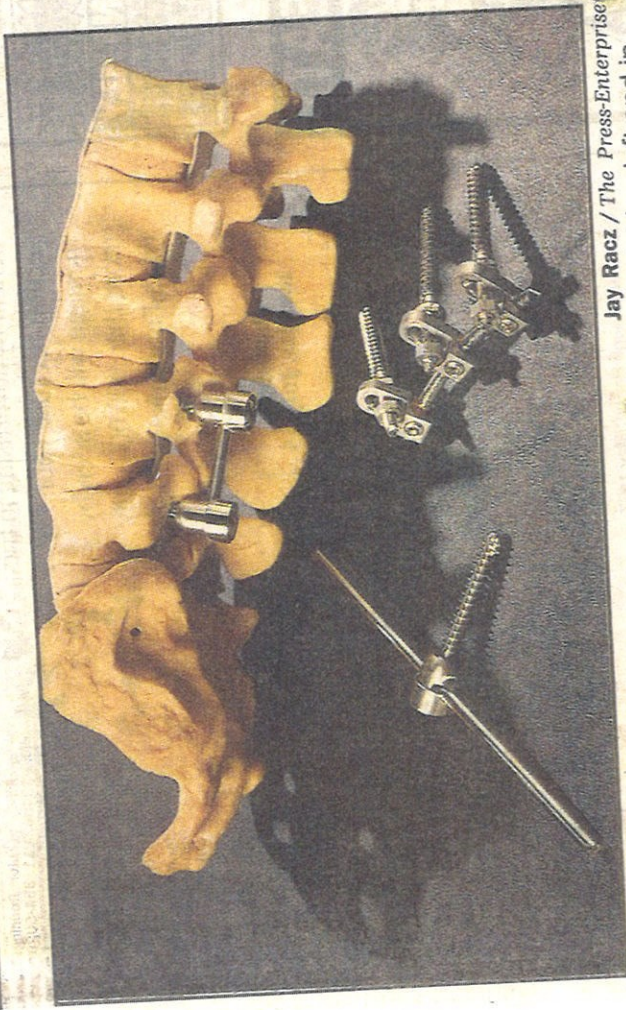
By Mike Schwartz
The Press-Enterprise

What the surgical world needed was a better pedicle screw, Dr. Thomas T. Haider decided four years ago.

Haider (pronounced HY-der), a Riverside orthopedic surgeon, had a big problem with then-available screws, which are placed in the pedicles — bony bridges connected to each vertebra — to stabilize the spine after fusion surgery.

Nothing on the market was easy for surgeons to use, nor strong, safe or streamlined enough, he says.

Today, Haider has patented what may be the most sophisticated and easy-to-use pedicle screw yet devised for back fusion surgery. Currently his brainchild is being reviewed by the federal Food and Drug



Jay Racz / The Press-Enterprise

▷ A new style of pedicle screw, designed by Dr. Thomas Haider, left and in section of model spine. An older system of screws and rods is at right.

Administration. If all goes well, it will be manufactured by G.R. Peterson Engineering, San Diego, and first used on patients sometime next year, he says.

Haider plans to donate all royalties from his invention, dubbed the Haider-UCR Spinal System, to the University of California, Riverside, to aid in its plans for a medical school.

"This should really help get the school off the ground," he says of royalties estimated at between \$2 million and \$3 million a year. Haider, who is on the UCR Foundation Board of Trustees, also recently made an initial pledge of \$5 million.

The genesis of Haider's idea sprung from the very complexity of spine-fusion surgery. Often this is the only good option when discs and the small gliding joints be-

tween each vertebra degenerate in the lower back, allowing spinal bones to slip painfully over each other.

Fusion involves stabilizing part of the spine permanently in a desired position with pieces of grafted bone borrowed from elsewhere in the vertebrae.

A spine deformed or weakened from injury or disease, however, may need extra help in the form of implanted pedicle screws that connect rods or plates spanning two or more vertebrae. This metal scaffolding holds everything in place for up to a year while bones grow tightly together.

Although a vast improvement over the clumsy wires and hooks of yesteryear, Haider recalls that hardware available in 1993 still was inadequate.

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SPINE: Riverside orthopedic surgeon develops post-surgical support mechanism

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For one thing, stainless-steel screws sometimes snapped from stresses created by rods that never fit precisely flush with them. Surgeons had to bend each rod to conform to the spine's curvature and use a complex series of connectors to attach rods to screws that stuck out of bone at varying angles.

Not only were too many steps involved in the installation, but the bulky contraptions often could be felt under the skin, causing patients discomfort while lying down. "These screws were just too hard to use," Haider says.

Dreaming of a system more compatible with human anatomy and easier for surgeons to handle, Haider came up with an innovative polyaxial design.

This was a screw with a rounded head, contained within a housing that surgeons could move and tighten in any position. A rod then could be locked snugly and without stress into the housing, while aimed precisely at an adjacent screw.

Haider enlisted the aid of a machinist in 1993 to help him

alleged, however, that surgeons often used the screws without telling patients they were not approved for spinal surgery.

Dr. Arthur Steffee, Acromed's founder, insisted that many cases involved early experiences with screws dating back to 1985-86, and that the technology had substantially improved since then. Steffee said that breakage of the hardware he developed was no worse than other spinal devices. Complications, he said, were unlikely when the device was installed by well-trained surgeons who selected the right patients.

Subsequently, the FDA warned manufacturers to stop promoting the screws to surgeons for use in the spine until further studies proved this is safe and effective.

Then, in 1994, the federal agency appointed an independent panel to look at 3,500 patients who received pedicle screws and plates between 1990 and 1992. The study was backed by the American Academy of Orthopaedic Surgeons, the Scoliosis Research Society, the North American Spine Society, and other professional groups.

After the FDA panel unanimous-

ually was restored.

In January 1995 the FDA began authorizing manufacturers to market bone screws for use in the pedicle for limited indications such as severe slippage of lumbar vertebrae.

Last December Acromed agreed to a \$100 million settlement that resulted in dismissal of all liability claims.

Haider resurrected his own pedicle screw research last year.

He quickly discovered, however, that a polyaxial screw already was on the market. Haider was elated and upset at the same time.

"I think our idea must have leaked out," he says of his 1993 design. "We were just months away from it. We had it first."

Undaunted, Haider took a hard look at the marketplace. With the help of his brother, Robert, an engineer at Hughes Network Systems in San Diego, and Todd Ackerman, a clinic manager with a nursing background, he further refined the concept.

Unlike existing designs, he came

with a set screw with a recessed hole, allowing surgeons with no more than a slender hex wrench to torque it down without cracking bones or tearing tissue around the incision. Its ease of installation reduced the 6-to-8-hours spent in surgery by half.

"This is a great advance," says Dr. Anthony P. Dwyer, professor of orthopedic surgery and Haider's fellowship director at the University of Colorado Health Sciences Center. "It's much easier and user-friendly than other designs. There's less of a 'fiddle factor.' This means less operating time and complications like infections or blood loss."

Haider figures his invention will be widely used once surgeons know he doesn't stand to gain financially from it.

"Physicians are a funny group," he says. "That has a certain appeal."

The new pedicle screw is not Haider's first philanthropic project.

In November, he launched the Children's Spine Foundation, a nonprofit organization based in

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Women's serotonin production low, research suggests

Dallas Morning News

Women may have a higher rate of depression than men because their brains produce less of the chemical serotonin, a study sug-

gests. Serotonin is made in many tissues in the body; in the brain, too little serotonin is thought to depress mood or increase anxiety. Antidepressants such as Prozac exert their effect by making more serotonin available to brain cells.

Previous research has suggested that women have less serotonin in their brains than men do. But those studies didn't determine whether women make less serotonin in the first place, or if the chemical was broken down more readily.

In a recent issue of the Proceedings of the National Academy of Sciences, researchers from McGill University in Montreal report that, at least in younger people, women make less brain serotonin than men. The scientists used a brain imaging technique called PET to compare eight men and seven women between ages 18 and 35.