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TOP STORY

The cutting edge: A Casper doctor treats carpal tunnel with augmented reality

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Casper radiologist Dr. Joseph McGinley performs a procedure to treat carpal tunnel syndrome Monday using an augmented reality device at Casper Medical Imaging. The procedure is designed to offer a faster, cheaper and less invasive option for treating carpal tunnel.

Elysia Conner

For more than two years, Daniel Hogdin has struggled to hold on. Utensils slip through his fingers. Coffee cups crash to the floor.

“Sleeping was the worst,” Hogdin said. “It would climb up your arm into the elbow.”

There are ways to treat carpal tunnel syndrome, the illness plaguing Hogdin. He’s tried cortisone shots, twice. But both times the benefits of the shot, meant to treat inflammation, wore off, and there’s a cap on how many cortisone shots doctors are willing to prescribe.

He considered surgery, but the recovery time would mean he'd need to take weeks off work. He's an electrician, so his hands are his livelihood. Plus, surgery is expensive and would leave a scar about 3 inches long down his hand.

Then his wife, who works at Casper Medical Imaging and Outpatient Radiology, told him about an innovative new procedure somebody at the practice was pioneering. The recovery time would be days rather than weeks. Hogdin decided to give it a try.

The procedure is the first of its kind, combining a handful of new medical technologies to perform a faster, cheaper, less invasive surgical alternative to relieving carpal tunnel syndrome.

The elevator pitch is this: Casper radiologist Dr. Joseph McGinley will make a cut about 4 millimeters tall in Hogdin's wrist. He'll insert what looks like a long plastic wand into the hole and position it right under the ligament pressing against the nerve in Hogdin's hand, causing his symptoms. The wand has a little blade at the end, and when McGinley is ready, he'll release the blade, and it will cut through the ligament, relieving Hogdin's carpal tunnel.

The whole thing will take 20 minutes. Hogdin will be awake the whole time. He won't even need to take off his shoes.

To begin, McGinley slips a pair of goggles affixed to a visor over his head. The visor is marked with the same crest his other inventions bear: a large golden "M" inside a golden frame.

He drags a gray plastic rectangle across Hogdin's arm. It's an ultrasound transducer and as McGinley pulls it across the skin, an alien landscape appears on the ultrasound screen—what Hogdin's arm would look like sans flesh.

McGinley finds the hand's main nerve and artery and marks a "safe zone" to make sure he avoids them. He knows where the nerves and arteries are because he can see them, projected onto his visor and overlaid across Hogdin's arm.

This is the first innovation married with the second. McGinley is using an augmented reality device he developed with students at the University of Wyoming that works with ultrasound technology. The ultrasound image is visible through the goggles, so McGinley can look through the goggles and see both Hogdin's arm and what the ultrasound sees underneath.

This is where the second part of the carpal tunnel procedure comes in. McGinley can use his device to map out the hand and see the ultrasound image in real time, but he still needs to be able to cut the ligament.

He uses a relatively new tool to do the cutting, developed by doctors at the Mayo Clinic in Rochester, Minnesota. It's called a microknife, or more specifically the Sonex SX-One MicroKnife. It, too, is reflective of a medical industry increasingly looking for less invasive ways to treat common problems. Carpal tunnel is a perfect example, considering it afflicts about 12 million people in the U.S. alone.



Dan Hogdin tests his wrist after his first surgery Monday for carpal tunnel syndrome at Casper Medical Imaging.

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There are other minimally-invasive carpal tunnel relief procedures that are done endoscopically, or basically by inserting a tube with a camera at the end into the wrist. The problem is that the doctor can only see what the camera sees. With McGinley's procedure, he can see inside the whole arm, right in front of him.

"We get the best of both worlds," he said.

McGinley said his hope is to continue to leverage new technology to make procedures better, faster and more affordable.

He's currently the only doctor in the state performing this carpal tunnel relief procedure. But he's also leading the way with a number of other technologies. He has a few patents to his name and has a transnational client list for his innovations. His work using botox to treat a common sports injury called compartment syndrome has been featured in magazines and trade publications.

His augmented reality ultrasound technology is enabling him to do more minimally invasive procedures, and he said it will soon be a necessary supplement to endoscopic procedures to his practice.

The device can be used for any number of procedures, McGinley explained, not just carpal tunnel release. Earlier this week he used the goggles to shave a patient's bone spurs. His ultimate goal is to eliminate surgery as a necessity as often as possible.

"Anytime you can eliminate a surgery ... it's going to be better for everyone involved," he said. "Anything done with surgery, we'd love to find a way to do without."



Dr. Joseph McGinley prepares to perform a procedure to treat a patient's carpal tunnel syndrome Monday using an augmented reality device.

Elysia Conner

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