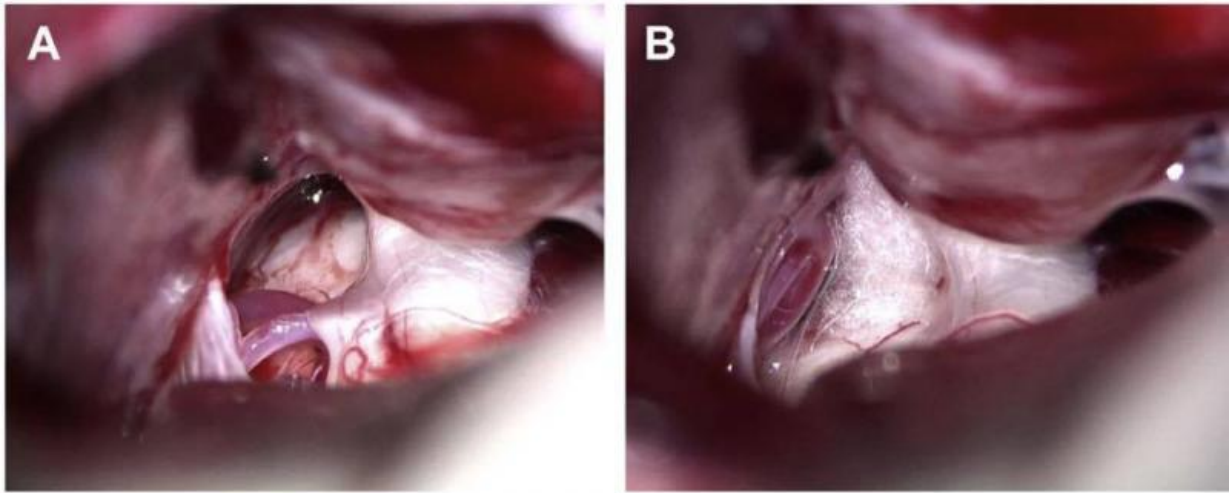


Easing excruciating facial nerve pain

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Photograph A shows the trigeminal nerve being compressed by the superior cerebellar artery. B: After a microvascular decompression has been performed, the nerve-pinching artery has been moved away (decompressed) from the trigeminal nerve and held in place by a Teflon sponge. Credit: Dr. James K. Liu

For more than a year, Surujdai Kalladeen suffered excruciating pain in her face that would render her unable to work or do anything for long stretches of time. After seeking help from several doctors, including a neurologist who prescribed anti-seizure medication, she was exhausted from the side effects.

Researching her symptoms, her son, Mark, thought she might be

suffering from trigeminal neuralgia, a chronic [pain](#) condition that affects the trigeminal, or fifth cranial nerve, which provides sensation in the face and powers motor functions such as biting and chewing.

"My youngest son was in college and he looked it up and saw that it's sometimes called 'suicidal [pain syndrome](#)' because it's so bad. It's like you go crazy," said Kalladeen, a Hillside resident. "It's hard to explain it, but the feeling is, 'I don't want to live like this.'"

The pain is caused by a blood vessel that pinches the trigeminal nerve, and as the blood vessel pulsates with every heartbeat, so does the pain. It occurs in about 12 per 100,000 people a year, mostly over age 50, though it can occur at any age. It's more common in women than men.

"Someone with this pain experiences a stabbing, electric shock in the face. There's really no good long-term relief with medication," said Dr. James K. Liu, director of the Center for Skull Base and Pituitary Surgery at Rutgers Neurological Institute of New Jersey.

The road to diagnosis can be long and confusing. The pain is often mistaken for dental problems, and some patients have teeth removed before trigeminal neuralgia (also called tic douloureux) is diagnosed, Liu said. The pulsating pain causes repetitive damage to the nerve, which intensifies the excruciating pain. The flashes of pain can be triggered by vibration or simply by brushing teeth, eating, drinking, talking, or being exposed to the wind, according to the National Institute of Neurological Disorders and Stroke.

"I had one patient who came in and was just totally disheveled because she was depressed and embarrassed to be in public because of the pain," Liu said. "She was afraid to open her mouth because the minute she began to talk, she would experience the shock."

Kalladeen's worried son, then a Rutgers University-New Brunswick student majoring in kinesiology and exercise science, told his mom: "If you want me to finish college, you've got to do something."

In October 2014, Liu performed the procedure, called endoscopic-assisted microvascular decompression. Making a small incision behind the ear in the skull, Liu uses a high-powered microscope and a high-definition endoscope to look deep into the tiny structures at the base of the skull.

"There's a natural corridor we can go through without violating any of the brain and we can find the vessel, move the vessel away from the nerve, and then I put in a little cushion – a Teflon implant – that prevents the artery from pinching the nerve," Liu explained.

When Kalladeen awoke after the surgery, the pain was gone.

"I didn't feel pain in my face. I didn't need medication anymore," she said.

Liu says of the 200 [skull-base](#) surgeries he performs a year, about 20 are microvascular decompressions. What's unique about his approach is that by using the endoscope he is able to perform the procedure without using a brain retractor. The results: A majority – 95 percent – of patients experience facial pain relief without further medications, and no patients have experienced facial nerve weakness, hearing loss complications or cerebrospinal fluid leakage.

"We have a very high success rate with a low complication rate," he said, and patients leave the hospital after an average two-day stay. A research paper authored by Liu on trigeminal neuralgia was published in *Neurosurgery Clinics of North America* in July and he presented his surgical outcomes at the Congress of Neurological Surgeons 2015 annual

meeting.

Liu, also an associate professor at Rutgers New Jersey Medical School, became fascinated with the base of the skull early in his medical education. "This is where all of the critical, vital structures of the brain enter and exit to give function to everything," Liu said. "It allows us to move our eyes, allows us to have sight, to chew on food, to speak."

Microvascular decompression is one of many skull base surgeries Liu performs. He is amongst few in the country who perform cerebrovascular bypass, a technically demanding procedure which brings additional blood flow to the brain by threading a healthy blood vessel within the scalp into the skull and connecting it to a blood vessel on the brain that's in dire need of more blood flow. Liu also removes pituitary tumors through the nose via minimally invasive endoscopic endonasal surgery.

Two years after the surgery, Kalladeen is continuing to work as a medical assistant in a medical practice without fear of debilitating facial pain. She watched her son, Mark, graduate from Rutgers this year and go to work as a personal trainer.

"I do everything I want to do," Kalladeen said. "Dr. Liu gave me a new life."

More information: Smruti K. Patel et al. Overview and History of Trigeminal Neuralgia, *Neurosurgery Clinics of North America* (2016). DOI: [10.1016/j.nec.2016.02.002](https://doi.org/10.1016/j.nec.2016.02.002)

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