

Team offers innovative approach to treat patients with complex temporal bone defects

August 11 2017

Temple University Hospital is offering an innovative approach to treat patients with complex temporal bone defects, including conditions known as tegmen dehiscence and temporal encephalocele (TE). The temporal bones are a pair of bones that form part of the side of the skull. They perform several key structural functions, including enclosing the middle and inner ear and supporting the temple. In addition, nerves and blood vessels leading to the brain traverse the bones.

Tegmen dehiscence and TE are rare and underdiagnosed neurotologic conditions where the bone between the brain and the ear is absent. This can be caused by a chronic ear infection; trauma to the area; or it can be idiopathic often associated with patients with higher body mass indexes (BMIs) and suffering from sleep apnea.

Patients suffering from these conditions can have a loss of hearing, drainage of brain fluid out of the ear, dizziness, and a risk of contracting meningitis. Appropriate management of tegmen dehiscence and TE requires surgical repair. Doctors can perform a traditional middle fossa [craniotomy](#) where part of the skull is surgically removed and the brain is retracted to view the problem area. Surgeons then use a microscope to get a direct view to make repairs. This method is invasive and can lead to temporary deficits in cognitive function and increased risk of cerebrovascular accidents.

However, Temple physicians recently began offering a less invasive and innovative approach to successfully repair tegmen dehiscence and TE by

using an endoscopic keyhole craniotomy approach. It is a multidisciplinary effort led by Pamela Roehm, MD, PhD, Professor of Otolaryngology- Head and Neck Surgery in the Temple Head and Neck Institute and the Lewis Katz School of Medicine at Temple University (LKSOM), and Director of Otology and Neurotology at Temple University Hospital (TUH); and Kadir Erkmen, MD, Professor of Neurosurgery at LKSOM, and Director of Cerebrovascular Neurosurgery at TUH. Drs. Erkmen and Roehm recently published their experience in the *Journal of Neurosurgery*.

"We were looking for better ways to treat patients with these complex conditions and that meant getting a clearer view of the problem area with an endoscope," says Dr. Roehm. "We started gradually adding the equipment into the surgery and it worked. We think this is a far superior approach to a traditional craniotomy when it comes to treating patients with tegmen dehiscence and temporal encephalocele."

The use of the endoscope allows for a smaller skin incision, a small craniotomy and less retraction on the temporal lobe than a traditional middle fossa craniotomy approach, which means less risk of brain retraction injury. Unlike the microscope used in a standard craniotomy, which has a zero degree view, the endoscope can see around corners at zero, 30 and 70 degree angles in addition to the direct view. Also, due to the small size of the incision, minimal hair shaving is required.

"The endoscopic-assisted keyhole craniotomy is a novel approach in treating temporal bone defects and we have performed a number of successful surgeries already," explains Dr. Erkmen. "This is a true example of one of the countless ways Temple doctors from different departments are teaming up to be able to offer patients more options for their treatment."

Provided by Temple University

Citation: Team offers innovative approach to treat patients with complex temporal bone defects (2017, August 11) retrieved 26 April 2024 from <https://medicalxpress.com/news/2017-08-temple-hospital-approach-patients-complex.html>

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