The Center for Facial Pain is led by Jonathan Chilton, MD, neurosurgeon. Dr. Chilton has extensive expertise in microvascular decompression, percutaneous rhizotomy and Gamma Knife Radiosurgery for the management of Trigeminal Neuralgia.

Jonathan Chilton, MD
Neurosurgeon
MD: Rochester School of Medicine
Residency: Georgetown University

Jonathan Chilton has extensive expertise in microvascular decompression, percutaneous rhizotomy and Gamma Knife Radiosurgery for the management of Trigeminal Neuralgia.

William Rosenberg, MD
Neurosurgeon
MD: Harvard University
Residency: Massachusetts General Hospital

The Center for Facial Pain is also led by William Rosenberg, MD, neurosurgeon. Dr. Rosenberg has extensive expertise in microvascular decompression, percutaneous rhizotomy and Gamma Knife Radiosurgery for the management of Trigeminal Neuralgia.

Peter Basta, MD
Neurosurgeon
MD: Medical College of Wisconsin
Residency: Saint Louis University

Peter Basta has extensive expertise in microvascular decompression, percutaneous rhizotomy and Gamma Knife Radiosurgery for the management of Trigeminal Neuralgia.

Jayson Neil, MD
Neurosurgeon
MD: New York Medical College
Residency: New York Medical College

Jayson Neil has extensive expertise in microvascular decompression, percutaneous rhizotomy and Gamma Knife Radiosurgery for the management of Trigeminal Neuralgia.

Additional Resources:

The Facial Pain Association
408 W. University Avenue, Suite 602
Gainesville, FL 32601
info@fpa-support.org
www.endthepain.org
Tel: 352-384-3600 • 800-923-3608
Fax: 352-331-3606

IRSA (International Radiosurgery Association)
3002 N. Second Street
Harrisburg, PA 17110
irsa@irsa.org
www.irsa.org
Tel: 717-260-9808
Fax: 717-260-9809
The Center for Facial Pain at the Midwest Neuroscience Institute at Research Medical Center offers comprehensive care for the diagnosis and treatment of all types of facial pain, including trigeminal neuralgia.

Trigeminal Neuralgia (TN) is a distressing problem for both patients and their physicians and frequently requires a multidisciplinary approach in order to achieve adequate pain control.

Facial Pain Facts

Trigeminal Neuralgia Treatment

Anticonvulsant medication is the first line of treatment for patients with trigeminal neuralgia (TN). Neurosurgical treatment is reserved for those patients who fail to respond to drugs or develop unacceptable medication side effects. Whereas open skull surgery for microvascular decompression (MVD) of the trigeminal nerve is the most durable procedure for TN, radiosurgery and percutaneous needle procedures can also provide relief from disabling pain in patients who are not candidates for open skull surgery or elect not to undergo a craniotomy procedure.

Percutaneous Needle Procedures

In 1955, Dr. C. Hunter Sheldon proposed that compression rather than decompression of the trigeminal ganglion, was the final common pathway leading to relief of TN during the open skull surgeries he performed to widen the bony foramina through which the branches of the trigeminal nerve exited the skull base. Techniques were subsequently developed to lightly traumatize the nerve including thermal coagulation (radiofrequency lesioning) and glycerol (a sugar alcohol toxic to nerve tissue) injections. The ability to access the trigeminal ganglion minimally invasively through the foramen ovale then led to the popularization of the three most common needle procedures still in use today: percutaneous radiofrequency rhizotomy, retrogasserian glycerol injections and percutaneous balloon compression.

Percutaneous Balloon Compression

Percutaneous balloon compression (PBC) was introduced by Dr. Sean Mullan in 1983 and has become increasingly popular over time due to the relative simplicity of the technique and excellent patient tolerance. Unlike radiofrequency rhizotomy which requires that the patient be awake during portions of the treatment, PBC is performed under brief, continuous anesthesia.
Procedure

Following general laryngeal mask airway (LMA) anesthesia (endotracheal intubation is not required) the patient is positioned supine. External skin landmarks are identified in order to triangulate the needle trajectory to the foramen ovale and facilitate needle positioning. A finger is used to palpate inside the mouth during needle positioning, to avoid mucosal penetration, and AP and Lateral fluoroscopic imaging is utilized as needed to assure safe needle placement (figure 1). There is a characteristic loss of resistance along with a reflexive contraction of the jaw (stimulation of the motor branch of the trigeminal nerve) upon entering the foramen ovale. The depth of the needle is then adjusted by x-ray to target the specific symptomatic division or divisions of the nerve.

A balloon tipped catheter is inserted through the needle and inflated with 0.6 to 0.8cc of contrast under fluoroscopic visualization (figure 2). The shape of the inflated balloon correlates with patient outcome, and visualization of a teardrop or pear shape on lateral X-ray and a slanted oval configuration on AP imaging confirms proper balloon position² (figure 3).

Bradycardia and asystole may occur during balloon inflation.⁷ Compression is usually maintained for 1.5 minutes in patients who have not had prior neurosurgical procedures for TN, and up to as long as four minutes in patients with difficult to manage pain recurrence. Patients are discharged on the same day and can return to activity/work without restrictions the day after the procedure.

Potential risks and complications including diplopia and masticatory weakness/malocclusion rarely occur and usually resolve spontaneously. There is a small risk of inadvertent carotid artery puncture, which could potentially lead to delayed aneurysm formation or stroke, but has not been witnessed in our series of over 500 patients. Numbness is an expected outcome of the procedure but does not occur in every patient. The amount of numbness is related to the length of balloon compression and the presence of numbness correlates with an improved outcome.² Numbness may include corneal anesthesia when treating V1 pain. Severe dysesthesias or uncomfortable numbness (Anesthesia Dolorosa) occurs in less than one percent of patients treated with balloon compression.¹
Outcome

Relief of severe TN pain is usually immediate, but can occasionally take up to 24 hours. If patients still have pain after 24 hrs, the procedure is repeated using a longer compression time. There is an approximately 85-90% initial success rate after PBC. Symptoms may gradually return over time, with five-year recurrence rates averaging around 50%. Longer compression times resulting in more profound hypalgesia may lower the recurrence rate but results in a higher incidence of troublesome facial numbness. Some studies suggest that patients with multiple sclerosis (MS) have higher rates of recurrence, which has been our personal experience at Research Medical Center.

Conclusion

Percutaneous Balloon Compression is a safe and effective procedure, which provides rapid relief of severe pain in most patients, with minimal risk and early recovery.

References


