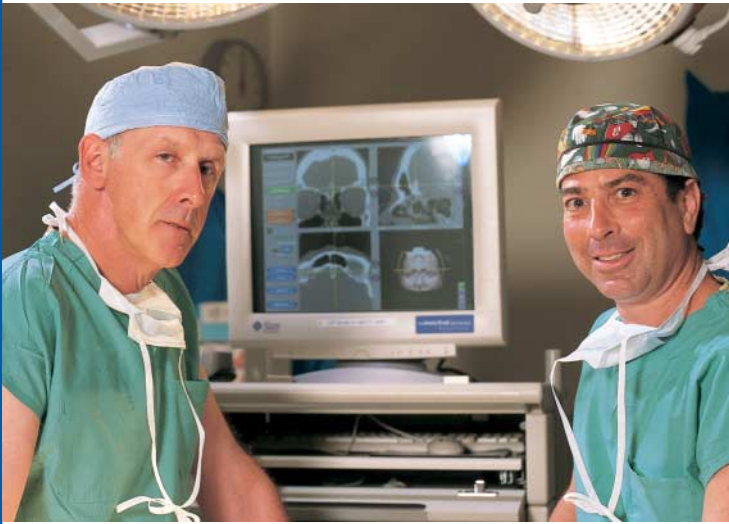


Contemporary Medicine

OTOLARYNGOLOGY-HEAD AND NECK SURGERY

Jefferson Surgeons Using Image-Guided Surgery to Treat Chronic Sinus Problem



William M. Keane, MD, left, and Marc R. Rosen, MD

Surgeons at Thomas Jefferson University Hospital are combining the latest computer technology with traditional surgery to successfully treat chronic sinus problems less invasively. Image-guided surgery takes advantage of infrared technology, computer tomography (CT scans) and sophisticated computers to surgically treat sinusitis. Jefferson Hospital has been ranked among America's Best Hospitals 2003 for Ear, Nose and Throat care by *U.S. News & World Report*.

Sinusitis – One of the Most Common Problems for which Patients Seek Medical Care

Sinusitis typically occurs as a complication or superinfection after a routine upper respiratory tract infection or allergic inflammation in the nasal cavity. Normal sinus mucous drains into the nose through small channels, which then help humidify the air and lubricate the upper aerodigestive track. Patients with chronic sinusitis may have anatomically narrowed natural drainage passages that predispose them to developing sinusitis with any inflammatory condition of the nasal lining. Approximately 35 million people develop sinusitis annually in the United States.

Routine upper respiratory tract infections and allergies with their accompanying sneezing, watery eyes and clear runny nose normally should clear within five to seven days with rest, hydration and analgesics. Patients with anatomic narrowing of their sinus pathways typically progress to a sinus infection accompanied by facial pain, pressure headaches, thick discolored mucous, dental pain and persistent congestion and often loss of smell as well.

According to William M. Keane, MD, Professor and Chair of Otolaryngology-Head and Neck Surgery at Jefferson Medical College of Thomas Jefferson University, patients whose chronic sinusitis or recurrent infections do not respond to treatment with antibiotics, decongestants, antihistamines and topical nasal sprays, may become candidates for endoscopic sinus surgery.

Sinus Surgery Yesterday and Today

Traditional sinus surgery, Dr. Keane says, "can be a complicated and prolonged procedure sometimes

entailing facial incisions through the roof of the mouth or between the eyes to gain access to the sinus cavities. With modern endoscopic sinus surgery, the sinuses are entered through the nasal passageway much like going through a corridor and gaining access to the rooms off the corridor. Traditional surgery involved essentially taking off the wall to gain access, whereas endoscopic surgery simply opens the door to gain access."

Dramatic Advantages of Image-guided Surgery

Dr. Keane points out that this minimally invasive, outpatient procedure, results in less postoperative swelling, pain and risks and dramatically shortens patients' recovery time. In the state-of-the-art approach in use at Jefferson, surgical teams use 3-Dimensional computer reconstruction of the patient's sinuses to guide them through the surgery.

The image-guided technique, in use extensively at Jefferson Hospital for the past six years, allows more appropriate aggressive treatment while minimizing risk and shortening operative time. This technique has been used extensively at Jefferson Hospital for the past six years.

According to Marc R. Rosen, MD, Assistant Professor of Otolaryngology-Head and Neck Surgery at Jefferson Medical College of Thomas Jefferson University, "because the sinuses are in close proximity to the brain, cerebral spinal fluid-filled areas, the orbital musculature, optic nerves, the carotid arteries and cerebral arteries which control blood flow to the brain, previous intranasal and endoscopic techniques without image-guided technology often resulted in less complete surgery to avoid injuring these structures. Now, sophisticated CT and computer equipment is able to guide the surgeons through the sinus cavities as they work, much like a GPS (Global Positioning System) of the sinuses."

This leading-edge CT equipment has the computing power to reassemble the 2-Dimensional CT scan into 3-Dimensional images of the sinus cavities so that the surgeons can see the patient's anatomy while performing surgery. The surgical team can rotate, on the screen, different views while planning and conducting the surgery. The surgeon places a mask on the patient's head in the operating room as part of an infrared technology system that correlates the position of the endoscopic surgical instruments with the CT images on the computer screen. The procedure is conducted stereotactically using the mask on the patient to allow the computer to display the location of the surgical probes with 3-D imaging.

"With 3-D mapping we can more safely navigate through the nose and precisely remove obstructions in critical areas minimizing the risks to the brain, eyes, optic nerves and major blood vessels. This promotes a level of precision and safety never before achieved in operations for chronic sinusitis," says Dr. Rosen.

More than 500 patients a year benefit from 3-D endoscopic image-guided surgery at Jefferson Hospital,

Helping Patients Regain Balance and Remain Steady on Their Feet

When a patient says the world seems off-balance or that he or she is frequently in a state of dizziness, it's not because that patient just rode a roller coaster. He or she, in fact, may have an imbalance of the inner ear due to an infection or a vascular or neurological problem, says a hearing specialist at Thomas Jefferson University Hospital.

Specialists at Jefferson's Vestibular Lab, located in Jefferson Hospital's Hearing Center, can diagnose an imbalance accurately and provide patients with the rehabilitation they need to help get them fully planted on their feet.

The Vestibular Lab, which works in cooperation with Jefferson's Outpatient Rehabilitation Program, focuses on helping individuals who are not candidates for medication or surgical treatment overcome the effects of dizziness and imbalance in the vestibular system. The vestibular system, the vestibule of the inner ear (containing three semicircular ducts) helps the body remain balanced. Balance also relies on visual cues and sensation in the lower extremities.

Imbalance symptoms often result from inner ear disorders or tumors, poor vascular circulation, stroke, head injury or other neurologic problems, explains Thomas O. Willcox Jr., MD, Associate Professor of Otolaryngology-Head and Neck Surgery at Jefferson Medical College of Thomas Jefferson University, and Medical Director of Jefferson Hospital's Hearing Center.

The lab's staff tries to sharpen a patient's balance by enhancing what functions he or she still has. To help patients sharpen their balance, the lab uses dynamic posturography, a computerized device often referred to as a "moonwalker," to assess a patient's "global" sense of balance. This state-of-the-art computerized assessment and training device uses interactive technology to guide and prompt the patient through a series of functional exercises. The therapists in the Jefferson rehabilitation program can teach patients gait or walking maneuvers.

For more information or to schedule an appointment, call **1-800-JEFF-NOW**.

one of the first hospitals in the Philadelphia area to offer this safer and more precise surgical option. An in-depth demonstration of this innovative procedure by Jefferson's expert Otolaryngologist-Head and Neck Surgeons was presented during a live web cast from Jefferson Hospital's operating room. The 60-to-90 minute web cast and Jefferson's library of web casts are available for viewing at www.JeffersonHospital.org/webcast.

Criteria

Those individuals who have symptoms of nasal obstruction and sinusitis who do not respond to medical management including decongestants, antihistamines, antibiotics and topical nasal steroid sprays may be candidates for image-guided surgery. Symptoms include facial pain, headaches, nasal congestion, nasal pressure, loss of smell, dental pain and discolored mucus five to seven days after an upper respiratory tract infection or following an allergic exacerbation.

For more information, contact **215-955-0215**.



Thomas Jefferson University Hospitals
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