

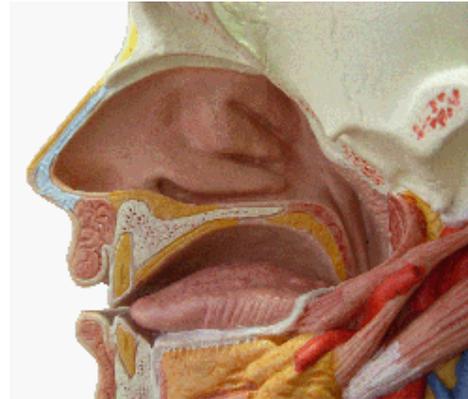
Functional Endoscopic Sinus Surgery (FESS)

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Your skull is filled with air!

The sinuses are air filled spaces in the skull. Most people do not realize these spaces exist in the skull until a problem develops, and they begin to experience the symptoms of sinusitis.

There are 4 pairs of sinuses – one pair over the cheeks (maxillary), forehead (frontal), between the eyes (ethmoid), and a last pair deep in the center of the head (sphenoid). The sinuses are connected to the nose and nasal cavity by way of small openings called ostia.



Except for the ethmoid sinuses between the eyes, the other sinuses are poorly developed at birth. They normally commence development in later childhood to attain their adult size at the onset of puberty.

Interestingly, no one fully understands the purpose for the existence of the sinuses.

One explanation is that the sinuses, being air-filled spaces, cause the skull to weight less than if it had consisted entirely of solid bone.

Another reason may be that the sinuses act as a protective buffer zone in injuries of the face, preventing force from being transmitted directly to the vital structures in the skull. Whatever their benefit, one thing is for sure – the sinuses can be the cause for a lot of trouble.

You can get sinusitis only if you have sinuses

Individuals who do not have a particular sinus will not develop sinusitis in that area. For example, 10% of people in the general population will have underdeveloped frontal sinuses. This makes it impossible for them to suffer from the excruciating headaches of frontal sinusitis.

A patient of mine, Mr. Tan, first realized how troublesome sinusitis can be when he first contracted the infection 2 years ago.

The symptoms first started as a flu, which caused blocked nose, runny nose, and pain over the cheeks. The pain got worse, and reached a crescendo 3 days later, when it was so painful that he was unable to go to sleep. He would wake up in the mornings feeling that he had not slept at all. The pain in the cheeks had also extended to involve the forehead, and the top of his head.

By this time, his nose was so blocked that he had to open his mouth to breathe. He would wake up the next day with a very dry and sore throat. Furthermore, he could not enjoy his meals as his sense of smell and taste had gone.

Initially he thought that the symptoms would go away in a week. However, when the symptoms continued to persist, and his ability to work was affected, Mr. Tan became desperate.

Over the next few months, he consulted many doctors and was given a myriad of different medications. He even sought treatment from several Chinese traditional physicians without benefit. Finally, one of the doctors he consulted had the wisdom to perform an endoscopic examination of his nose, and discovered that his sinus openings are blocked by swelling.

He went through a computed tomographic scan (CT scan) which demonstrated that he had sinusitis of both his maxillary and frontal sinuses. Sinus surgery was performed under general anesthesia.

One week later, his symptoms of pain, sorethroat, and inability to smell had disappeared. Since then, he has been enjoying very restful and peaceful nights of sleep.

Fortunately, many people suffer from sinusitis, but few need surgery for resolution of their symptoms. Most sinusitis can be treated with medications like antibiotics, decongestants, and antihistamines. Others may need simple outpatient procedures like a washout of their sinuses to flush away the pus and to open up the sinus ostia.

Allergy is the main course of sinusitis

The most common cause of sinusitis is allergic rhinitis, which accounts for up to 80% of cases of sinusitis.

The allergic response occurs as a result of an over-exaggerated response by the body's immune system to harmless benign substances that enter the body from the outside environment.

The reaction causes the lining of the nose to become inflamed and swell up (rhinitis), resulting in obstruction of the sinus ostia, and poor drainage of the sinuses.

Secretions build up, providing a good growth medium for bacteria, allowing them to flourish in an unimpeded fashion within the sinuses. Pus forms and accumulates under pressure, allowing some of it to squeeze and escape through the narrowed ostium into the nasal cavity. This gives rise to the yellow nasal discharge that is seen in sinusitis.

Sinusitis can have a variety of other causes. The common final pathway by which all these other diseases cause sinusitis is through obstruction of the sinus ostia resulting in poor sinus drainage. Thus, deviation of the nasal septum, foreign bodies, cancer, and nasal polyps can cause obstruction to the sinus ostia, giving rise to sinusitis.

As allergic rhinitis is the most common cause of sinusitis, it is imperative that an allergic process is assumed, and the offending allergen searched for in all cases of sinusitis. The allergen, or the substance that causes allergy, can come into our bodies through the air that we breathe in or from the foods that we consume.

Both inhalant and food allergies can be tested very simply through a blood or skin test. If the offending inhalant or food allergen is identified, and the appropriate treatment measures taken, a dramatic improvement in sinusitis usually occurs. This obviates the need for medications, antibiotics and surgery.

Improving sinus drainage with surgery

In those patients who are unable to benefit from anti-allergic measures and medications, surgery becomes an important consideration in management.

The simplest form of surgery is a sinus washout done under local anesthesia in the outpatient setting. The cheek sinuses are irrigated to wash out pus within the sinuses, and to open up the sinus ostia by forcing the irrigation fluid through it.

Other procedures include the Caldwell-Luc operation which involves opening up the cheek sinuses through a hidden incision underneath the upper lip.

Endoscopic minimally-invasive sinus surgery hastens recovery

With the advent of new technological inventions like the Hopkin's endoscopic rod, we enter a new era of improved visualization of the body's interior. It is now possible to perform minimally invasive key-hole surgery on the nose and sinuses.

The endoscope enables us to make more accurate diagnosis of the causes of sinusitis, and to identify new disease processes which could not have been identified before. It has also enhanced our ability to perform sinus surgery by peering through the nostrils instead of having to make unsightly facial incisions.

The new minimally invasive sinus operation that is done through the endoscope is called Functional Endoscopic Sinus Surgery (FESS). It is an operation that is done on the sinuses using an endoscope with the objective of restoring normal function to the diseased and obstructed sinuses.

FESS gave surgeons the power to see and operate with greater precision in the little confined spaces of the nose and sinuses. They were able to achieve the objectives of disease resolution and symptom improvement in a more effective way.

Many new refinements have been made with FESS surgery. In the past, FESS surgeons had to peer directly into the endoscope by leaning over the anesthetized patient lying on the operating table. Surgeons tired out easily as they were operating in an uncomfortable and awkward position.



Nowadays, most FESS surgery is performed through a video attachment to the endoscope that allows the surgeon to look at a video monitor while operating. It is less of a physical strain on the surgeon. The FESS surgeon can spend a longer time on the operation without experiencing fatigue. This translates into increased safety and better outcomes for the patient.

Vacuum suction microdebrider surgery improves safety

Another innovation is the use of an oscillating vacuum shaver (or microdebrider) during FESS surgery. The microdebrider is a surgical instrument that works like a hybrid between a vacuum cleaner and a hair trimmer. The trimmer chops off unwanted abnormal tissues, while the vacuum suction clears away unwanted debris and blood from the area of operation.

The microdebrider has the advantage of allowing the FESS surgeon to remove diseased tissue in a precise manner. It cuts tissues sharply, without causing tearing and shearing that would have resulted with conventional sinus surgery instruments. This reduces unnecessary damage to the sinus tissues, resulting in less scarring and more rapid healing.

During surgery, blood accumulation in the operating site blocks the surgeon's view of important structures that lie obscured beneath the surface. Danger lurks with possible disastrous consequences.

Particularly in the enclosed confined spaces of the sinuses, the complications that result from such a lack of visibility are exponentially magnified. The microdebrider allows timely and opportune removal of blood and tissue,

keeping the operation site clean so that the FESS surgeon can proceed safely and smoothly under conditions of good visibility.

Computer navigation sinus surgery improves surgical precision

Surgeons, like pilots, need good navigation. Occasionally, in complex sinus operations, surgeons may get lost in the surgical wound. They may not be able to identify with confidence the location of important structures, like the optic nerve, carotid blood vessels, nasolacrimal duct, and base of skull. In these instances, computerized navigation instruments are available to lend a guiding hand.

Computer navigation is particularly useful if the anatomical structures in the sinuses are distorted by developmental factors or previous surgery. It gives the surgeon more confidence in charting his course within the complex labyrinth of the nose and sinuses.

What about the laser? Does it offer any benefits or advantages in FESS surgery? Unfortunately, while the laser is indispensable in certain procedures, like skin surgery for instance, it has no real advantage in sinus operations. In fact, the laser may actually increase surgical risk when used in conjunction with FESS. It may cause inadvertent high-temperature laser burns and damage to important nearby structures around the sinuses, e.g. the eye, brain, and carotid blood vessels.

FESS surgery is still in the process of evolving and improving. Controversies and changing opinions continue to provide new insights into the present state of knowledge. It will be a long time before all the relevant issues are sorted out for it to become a mature operation.

The medical world is still on a learning curve with newer and better instruments and techniques coming into the market in an attempt to improve patient safety and surgical outcome.