

Endoscopic Sinus Surgery

Definition

An operation carried out through the nose to re-establish the normal ventilation and mucus drainage mechanisms in the chronically infected nose and sinuses by removing bone and soft tissue from around the sinus drainage and ventilation holes in the outer wall of the nose.

Anatomy and Physiology

The paranasal sinuses are air filled cavities with mucous membrane linings grouped around the nasal passages. A pair of sinuses (the maxillary antra) lie in the bones of the cheeks, whilst a second pair lie in the eyebrows (the frontal sinuses). Their drainage/ventilation passages run through a honeycomb of tiny sinuses between the eyes (the ethmoid sinuses) and all three drain into the nose under overhanging pelmet shaped bones which hang from the outer wall and roof of the nasal passages (the turbinate bones or conchae). The flow of mucus follows set pathways in healthy noses and passes through very narrow areas before reaching the nasal passages. Swelling of the mucous membranes in the narrow areas can cause blockage, resulting in bacterial overgrowth in the sinuses and the development of an infection.

Using fiberoptic telescopes (endoscopes) in conjunction with CT scans the endoscopic sinus surgeon is able to identify areas of inflammation and anatomical distortion of the bony structures which may block the drainage/ventilation pathways and cause sinus infection. This information is used to plan the removal of often very small amounts of bone and soft tissue from the blocked passages, re-establishing normal ventilation and drainage. Such surgery will also improve the penetration of drops and sprays into the nose and sinuses and enhance their abilities to control mucous membrane swelling.

Indications

Endoscopic sinus surgery is used to treat chronic rhinosinusitis which has failed to respond to medical treatment. It is also used to remove nasal polyps to allow sprays to reach the root of the problem. The technique may be used to drain inflammatory cysts (mucocoeles), to treat fungal infections of the sinuses, to biopsy tumours of the nose and sinuses, to drain abscesses in the eye socket and to treat nosebleeds.

Instructions Before Endoscopic Sinus Surgery

- Because of potential bleeding problems, aspirin, ibuprofen, and other non-steroidal anti-inflammatory drugs (NSAIDs) must not be used for 10 days preceding and 10 days following surgery.
- A complete history and physical examination , possibly including laboratory work, chest x-ray, and/or EKG, must be completed before surgery. This workup may be done in our offices or by your personal physician.
- Generally, endoscopic sinus surgery is done on an outpatient basis. You will need to arrange to have someone drive you home after surgery. Please check with your insurance company regarding hospitalization policies and whether you need a second opinion prior to surgery.
- Do not eat or drink anything after midnight before surgery for 6-8 hours.

Anaesthetic

A general anaesthetic is more usual, especially with the more extensive procedures. Local anaesthetic and blood vessel constricting medication is placed in the nose to reduce swelling and improve the surgeon's view of the inside of the nose. Occasionally local anaesthesia backed with sedation can be tried in limited sinus surgery.

Surgical Technique

The patient lies on their back with their nose pointed at the surgeon who passes a small, wide angle telescope into the nose. Camera is attached to the telescope which allows the surgeon to view direct image on the screen. Fine instruments are passed alongside the telescope into the nose. Bone and mucous membrane are then nibbled away from appropriate areas opening up the ventilation and drainage passageways. This causes some bleeding and it may be necessary to place a small pack (merocell) in the nose at the end of the operation to stop bleeding. This is removed within a 24 hours. Occasionally the amount of bleeding is excessive and it becomes difficult for the surgeon to see what he is doing. The surgeon will abandon the operation at this point rather than risk inappropriate removal of tissue or wandering beyond the nose and sinuses into the neighbouring eye socket or cranial cavity. It is safer to come back another day!

Length of Operation

The operation may last from 30 to 180 minutes depending on the extent of the procedure and the amount of bleeding.

Time in Hospital/Post Op Management

After surgery there are no external incisions to heal and the patient generally feels quite well. There is some minor nose bleeding and occasionally some minor headache which is generally readily controlled using pain killers. Inside the nose there are raw areas which may take weeks to heal. The operation causes swelling inside the nose and the raw areas may become infected causing further bleeding. To counter this the patient is usually asked to take antibiotics and, in the case of polyp disease, a short course steroids tablets may also be prescribed.

The normal mucus flow, the result of the coordinated beating of thousands of tiny hairs (cilia), is disrupted for up to 6 weeks after surgery. This static mucus is a good place for bacteria to overgrow. To prevent this patients are asked to washout their nasal passages with salt solution douches and sprays for several weeks post op. Inhaling steam from hot water in a heat proof bowl, or whilst showering, may also ease swelling and congestion. Most surgeons will inspect the nose 1 or 2 weeks post op and remove excessive mucus and blood clot with a suction apparatus. This speeds up recovery.

Forceful nose blowing is to be discouraged until the nose has healed and strenuous exercise avoided as both may cause further bleeding

Time off work/Limitations

Most people are able to return to work 2 weeks after surgery, although dusty atmospheres should be avoided until the nose is healed.

Potential surgical complications include bleeding, bruising around the eyes, swelling, scarring inside the nose, and infection. Rare complications include the possibility for intracranial entry and spinal fluid leak. The ethmoid sinus is located under and adjacent to the brain, and the fluid that surrounds the brain can leak through into the nose. If this happens, there is the potential for infection which can result in meningitis. Because the endoscopes used in surgery allow visualization of the ethmoid sinuses, this complication is uncommon. Double vision and loss of vision have been reported after ethmoid surgery. Fortunately, this is a rare complication. No surgery is always successful. This is the best sinus procedure available today.

Outcome and Prognosis

The outcome of endoscopic surgery is usually good. It is very good at relieving headache due to sinus infection (up to 80 %). It is slightly less good at relieving post nasal drip and catarrh. Loss of sense of smell may improve if the cause is the blockage of airflow to sensitive areas in the nose. It will be no better if these sensitive areas are already damaged and non-functioning. The effects of endoscopic sinus surgery are long lasting in most cases although medical treatment is often necessary post operatively, especially where the patient has an allergic tendency or a tendency to form polyps.

Endoscopic Sinus Surgery

General Information about Endoscopic Sinus Surgery (ESS)

Endoscopic sinus surgery is an operation in which the surgeon examines the interior of the nose and the openings to the paranasal sinuses. Using state of the art microtelescopes and instruments, abnormal and obstructive tissues are then removed. In most cases the surgery is performed entirely through the nostrils, leaving no external scars. There is little swelling and only mild discomfort.

Whereas, in the past, attention has often been directed towards the removal of all sinus mucosa from the major sinuses, the endoscopic approach relies on the principle that sinus disease is reversible if the underlying obstruction can be identified and corrected. A careful diagnostic workup is therefore important and consists of examination, CT scans of the sinuses, nasal physiology (rhinomanometry and nasal cytology), smell testing, and selected blood tests. Surgery is usually recommended only after medical therapy has failed.

Postoperative care:

- Sleep with your head slightly elevated for 2-3 days.
- No heavy lifting or straining for 7 days.
- Do not blow your nose or sniff forcefully.
- Sneeze with your mouth open if possible.
- It is OK to wipe your nose gently.
- It is normal to have mild bloody drainage for the first 24 to 48 hours.
- If the bleeding worsens or persists, sit up and spray your nose with Afrin or generic oxymetazoline, 2-3 sprays in each side.
- If the bleeding still does not stop, call your physician.
- Starting the morning after surgery, unless you are instructed otherwise, wash your nose out with salt water twice a day per the instructions on the NASAL SALINE INSTRUCTION sheet. Continue this until you are told it is okay to stop. **THIS IS VERY IMPORTANT FOR PROPER HEALING.**

- Use your nasal steroid spray, if prescribed, twice a day after irrigating with salt water starting the day after surgery.
- Take your antibiotic or oral steroid pills if prescribed.
- Take pain medicine as needed. If the pain is mild, you may use Tylenol or generic acetamenophin. Avoid aspirin or other anti-inflammatory medications.
- If you have any trouble with your vision or bruising or swelling around the eyes, call your physician.
- You will have either absorbable or removable packing in your nose. If it is removable, you will be given an appointment in the first day or two after surgery to have it removed.

Follow-up: You will need to be seen by your doctor for follow-up in 1-7 days following surgery depending on the presence or type of packing used, or need for post operative cleaning. Specific instructions will be given to you at the time of discharge. An appointment is necessary and should be made before leaving the hospital.

Saline Irrigations: Ten days after your nasal surgery, saline irrigations are recommended to reduce crusting and to keep the sinus opening clear. Mix 1 teaspoon table salt in 1 quart warm water. Put this solution into a "Water-Pick" bowl. (Water-Pik is a tradename for a dental cleaning device available at most drugstores for \$35 to \$50). Using the Ethicore Nasal Adapter (available in the Head and Neck Surgery Clinic) on the water-pik at settings between 1 and 2, lean over a sink and irrigate both nasal passages. Irrigate twice a day, morning and evening.

Sinus and Nasal Surgery

This information is provided to help you understand sinus and nasal surgery and to answer some of your questions. It is not meant to replace a discussion with your doctor and our clinical team.

SINUSES:

The sinuses are four cavities or rooms opening from each side of the nose. The four sinuses are named maxillary, ethmoid, frontal, and sphenoid. The purpose of sinuses is not completely understood. Sinuses normally produce about a quart of mucus every day. Sinus infections are one of the most common problems that cause a patient to go to a doctor. Blockage of the sinuses due to a virus or allergies is one of several ways that sinus infections can occur. Sinus infections may make lung problems worse.

Reasons for Sinus Surgery:

- Decrease the severity and number of sinus infections
- Make it easier to manage or cure sinus infections

- Improve breathing if polyps are present
- Prevent complications associated with blocked sinuses

Expectations After Sinus Surgery:

Sinus surgery alone does not always completely cure the sinus problems. Most people are much better after sinus surgery, but most patients will still need other medical treatment to keep the sinuses in the best possible shape. Sinus surgery does not cure allergies. Do not be discouraged if you do not feel better right away after the sinus surgery. The sinus surgery just opens up the sinuses, but the lining that has been damaged by infections may take weeks or months to heal so that the sinuses work better again. Be aware that if you have lost your sense of smell from sinus problems, it does not always return after sinus surgery. Drainage down the back of your throat usually improves but rarely goes away completely.

Alternatives to Sinus Surgery:

You should have received treatment with all reasonable medical options before considering sinus surgery. If your condition is not life threatening or dangerous to you, there is the option to just live with the problem.

Risks from Sinus Surgery:

Any surgery has some amount of risk associated with it. Your health care provider will discuss these risks in detail with you. This list does not include every single side effect that could possibly occur.

- Uncommon:
 - Nosebleeds in the first few days after surgery
 - Recurrence of polyps or sinus infections
- Rare:
 - Injury to the eye causing double vision or blindness
 - Spinal fluid leak

 - Loss of sense of smell

 - Brain injury or death

NASAL SEPTUM:

The septum of the nose is a wall made of cartilage and bone that divides the two sides of the nose. The septum can be deviated or bent due to a broken nose or sometimes it just develops that way. A deviated septum generally creates breathing problems on one side of the nose and does not change from time to time.

Reasons for Septal Surgery:

1. Improve breathing through the nose.
2. Reduce snoring.
3. Allow better access for sinus surgery.

Expectations After Septal Surgery:

Most people can breathe better through their nose after septal surgery. It is impossible to get human tissue completely straight, but we can generally straighten your septum enough to help you breathe. You may not breathe perfectly through your nose, but in most circumstances it will be a lot better. You may still need other medical treatment for other conditions such as allergy. Septal surgery does not cure allergies.

Alternatives to Septal Surgery:

You should have received treatment with all reasonable medical options before considering septal surgery. There are not many good medical options other than surgery for a deviated septum. If your septal deviation does not bother you much, there is the option to just live with the problem.

Risks from Septal Surgery:

Any surgery has some amount of risk associated with it. Your health care provider will discuss these risks in detail with you. This list does not include every single side effect that could possibly occur.

1. Uncommon
 - a. Nosebleeds in the first few days after surgery
 - b. Failure to relieve the blockage or recurrence of the blockage
2. Rare
 - a. Change in the outside appearance of the nose
 - b. A hole in the septum that may cause crusting, bleeding, and a whistling noise

TURBINATES:

The turbinates of the nose are found on each side of the nasal cavity. There are four turbinates on each side of the nose, but the lowest or inferior turbinates are the ones most likely to cause problems with the nose. The turbinates are bones covered by lining that can shrink and swell due to allergies, temperature or humidity changes, and a variety of irritants. They filter, warm, and humidify the air. Sometimes the turbinates get too large and block breathing. They usually block breathing on both sides of the nose, but the blockage may be worse on one side of the other depending on the time of the day.

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Reasons for Turbinate Surgery:

1. Improve breathing through the nose.
2. Reduce snoring.

Expectations After Turbinate Surgery:

Most people can breathe better through their nose after turbinate surgery. We can only remove a limited portion of the turbinates, but we can generally remove enough to help you breathe. You may not breathe perfectly through your nose, but in most circumstances it will be a lot better.

You may still need other medical treatment for other conditions such as allergy. Turbinate surgery does not cure allergies.

Alternatives to Turbinate Surgery:

You should have received treatment with all reasonable medical options before considering turbinate surgery. If your nasal blockage does not bother you much, there is the option to just live with the problem.

Risks from Turbinate Surgery:

Any surgery has some amount of risk associated with it. Your health care provider will discuss these risks in detail with you. This list does not include every single side effect that could possibly occur.

1. Uncommon
 - a. Nosebleeds in the first few days after surgery
 - b. Failure to relieve the blockage or recurrence of the blockage
2. Rare
 - a. Dryness and crusting of the nose

Can all of these surgeries be done at once?

Yes, if needed. The sinuses, septum, and turbinates may be operated on at the same time or separately depending on the patient's problem. The doctor, physician's assistant, or nurse practitioner will explain to you which structures will be operated on in your case.

What will happen before surgery?

X-rays:

You will usually have a CT scan of your sinuses prior to sinus surgery; however, you may not if you are just having turbinate or septal surgery. If you have had sinus surgery before, have bad polyps, or have a complicated case, you will usually have a special CT scan done that allows us to do the surgery with special x- ray guidance in the operating room. This is called image-guided surgery. It is a lot like having a GPS map in a car or on a boat to help guide you. It helps us tell how to get around in your sinuses better. It may make your surgery safer and allow us to do a more complete surgery in difficult cases.

Surgery Date:

Our surgery scheduler will work with you to find a convenient date for your surgery. When you call our clinic the day before surgery, you will be told where and when to arrive for surgery and given any instructions such as to when to stop eating or drinking.

Postoperative Sinus and Nasal Surgery Instructions

- Sleep with your head slightly elevated for 2-3 days.
- No heavy lifting or straining for 7 days.
- Do not blow your nose or sniff forcefully.
- Sneeze with your mouth open if possible.
- It is OK to wipe your nose gently.
- It is normal to have mild bloody drainage for the first 24 to 48 hours.

- If the bleeding worsens or persists, sit up and spray your nose with Afrin or generic oxymetazoline, 2-3 sprays in each side.
- If the bleeding still does not stop, call your physician.
- Starting the morning after surgery, unless you are instructed otherwise, wash your nose out with salt water twice a day per the instructions on the NASAL SALINE INSTRUCTION sheet. Continue this until you are told it is okay to stop. THIS IS VERY IMPORTANT

FOR PROPER HEALING.

- Use your nasal steroid spray, if prescribed, twice a day after irrigating with salt water starting the day after surgery.
- Take your antibiotic or oral steroid pills if prescribed.
- Take pain medicine as needed. If the pain is mild, you may use Tylenol or generic acetamenophin. Avoid aspirin or other anti-inflammatory medications.
- If you have any trouble with your vision or bruising or swelling around the eyes, call your physician.
- You will have either absorbable or removable packing in your nose. If it is removable, you will be given an appointment in the first day or two after surgery to have it removed.

Nasal Saline (Salt Water) Irrigation

Nasal saline irrigation is used to maximize the health of the sinuses particularly in patients with poor sinus function due to a history of chronic sinus problems or patients recently undergoing surgery.

Instructions:

1. Boil 1 quart of tap or bottled water and pour into a clean jar.
2. Add 1 to 3 teaspoons of table salt or non-iodized salt (if possible) per quart of water and shake or stir. Adjust the amount of salt as needed that irritates your nose the least.
3. Some people prefer to add 1 teaspoon of baking soda (pure bicarbonate) to the solution to make it less irritating. This is optional.
4. Make up fresh each day or store in a refrigerator for no longer than one week.
5. LET THE WATER COOL TO ROOM TEMPERATURE BEFORE IRRIGATING YOUR NOSE. If it has been in the refrigerator you can warm it to room temperature with a microwave if preferred. DO NOT USE HOT SOLUTION.
6. Pour some of the solution into a clean bowl and fill the syringe with the salt water mixture.
7. Insert either a baby bulb syringe (preferred), a water pik, ear syringe, or 30cc medical syringe gently into your nose an inch or less.
8. Lean your head over a sink.
9. Wash out your nose with enough solution until it runs back out clear (at least 50cc).
10. Perform nasal irrigation twice a day as long as directed or until instructed to use a taper schedule.
11. If you use a nasal steroid: You should always use the mixture before using your nasal steroid spray (Flonase, Rhinocort, Nasonex, or Nasacort).
12. If you reuse a syringe, make sure you clean it vigorously at least once or twice a week to prevent bacteria from growing in the bulb.

