

This tutorial covers one of the commonest disease that affects the nose worldwide – rhinosinusitis. It also includes nasal polyps. Almost everybody will have an attack of rhinosinusitis every year and some people will have up to five such attacks. Viruses cause these and we know the disease as the Common Cold. However, in clinical practice we see many patients with bacterial infections and some with fungi as well. Some infections last for a few days others for months at a time and there are different medical terms for these, as we shall see.

We shall also learn about the factors that make rhinosinusitis more likely in some people than in others, how we classify and diagnose the condition and what treatments to offer.

Because some of the terms used in this tutorial are long I will abbreviate them. For example rhinosinusitis will be known as RS from now on and nasal polyps will be called NP. A full list of abbreviations is given at the end of the tutorial together with definitions.

A separate tutorial on allergic rhinitis will follow.

OVERVIEW OF RHINOSINUSITIS AND DEFINITIONS

The definitions used here are those we use in the non-hospital settings. In the United Kingdom and Europe they are the ones used by General Practitioners (family doctors) and they will be the ones you use as Primary Ear Clinicians in Cambodia. They are internationally recognized definitions.

Definitions.

In primary care the diagnosis of RS is based upon the patient's symptoms and not an in depth nasal examination or X-rays. So:

1. Acute Rhinosinusitis is defined as the sudden onset of two or more of the following symptoms:
 - a. Blockage
 - b. Discharge from the front of the nose or down the throat from the back
 - c. Facial pain or pressure
 - d. Reduced sense of smell

All of these must have been present for less than 12 weeks (three months). Acute RS is called intermittent if it comes and goes.

2. Chronic Rhinosinusitis is defined as nasal blockage with:
 - a. Facial pain or pressure or
 - b. Discoloured nasal discharge front or back or
 - c. Loss of sense of smell

All of these are present for more than 12 weeks (three months).

3. Nasal polyps will be found in patients with symptoms of Chronic RS (see 2 above) and who have polyps visible on simple nasal examination.

TYPES OF RHINOSINUSITIS

Acute viral RS.

Acute RS is usually caused by a virus and it is very common, especially in children. The symptoms are familiar to us all: nasal itching followed by a thin clear discharge that gradually thickens as the days pass. There is associated nasal obstruction and there may well be loss of smell and taste or facial pain. It is all over within five days and the nose returns to normal.

Viruses cause damage to the mucociliary system and make it less efficient at cleaning the nose. This means that bacteria may have the chance to grow in the nose and cause a bacterial RS.

Acute bacterial RS.

It is common for the acute viral RS to develop into bacterial RS after five days. If it does the symptoms of discharge, blockage, pain and loss of smell continue. The discharge may become thick and yellow or green. The problem will settle with time but if it lasts for more than 12 weeks it becomes chronic RS. Acute bacterial RS is usually caused by *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis*.

There is no known link between allergy in the nose and RS.

Chronic Rhinosinusitis (CRS).

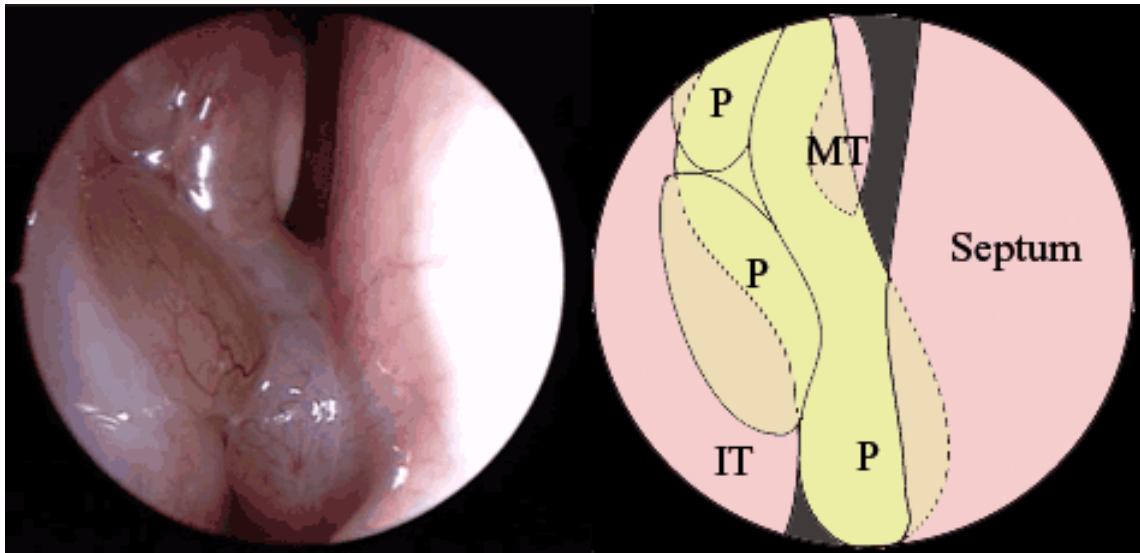
This is a common disorder. It is related to the following things:

1. Poor mucociliary function. When the nose cannot clean the air that passes through it gets infected more often. Smoking damages the ability of the cilia to clean the nose but sometimes the patient has a disease that prevents cilia from working properly. Cystic fibrosis is an example of this.
2. Allergy is commonly associated with CRS and must be treated properly.
3. Immunocompromise. Patients with HIV are more likely to have CRS and the organisms causing it are often unusual. *Aspergillus* species (fungi) and *Pseudomonas* are more common.
4. Poor upper teeth can cause CRS as the roots of the teeth sometimes go into the maxillary sinuses.

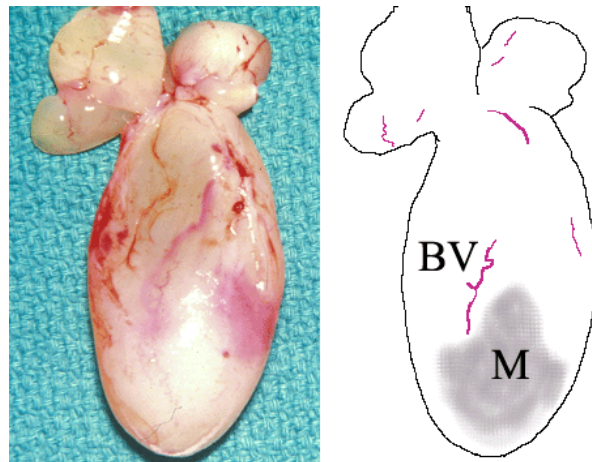
Nasal polyps (NP).

Nasal polyps are swellings that hang down into the nose (usually from the sinuses). They look yellow/grey and are shiny and mobile.

1. NP are commoner in men than women
2. Patients with asthma are more likely to have NPs than non-asthmatics.
3. Patients sensitive to aspirin are very likely to have polyps.
4. NPs occur more commonly in members of the patient's family than in the general population.



The picture shows nasal polyps (P) on the right side of the nose. IT is the inferior turbinate, MT is the middle turbinate.



This nasal polyp has been pulled out of the nose. It is smooth, shiny and a yellow/grey colour. You can see some blood vessels (BV) on its surface and an area where its surface has become thicker (M).

MANAGEMENT OF RHINOSINUSITIS

The main treatments available for RS are antibiotics and steroids (either by mouth or by nose spray).

Acute rhinosinusitis

There is no need at all for antibiotics within the first five days of acute rhinosinusitis. This is because a virus causes the problem and antibiotics will not help. However, once the AR has become bacterial and the nasal discharge is green /

yellow or there is associated sinus pain, antibiotics may be of help. Penicillin or amoxicillin for 7 to 14 days are good choices. Nasal steroids are not recommended as a single treatment for acute RS.

There is not much evidence that treating the nose long term with nasal steroids will reduce the frequency of acute RS.

A topical decongestant can be helpful as it unblocks the nose and may help drainage of the sinuses.

Chronic Rhinosinusitis without polyps

Nasal steroid sprays are very effective in treating the symptoms of CRS but there is little evidence that antibiotics in short courses help. Of course, if a patient with CRS develops symptoms of acute rhinosinusitis on top then oral antibiotic will help.

However, if a patient does not get better on nasal steroid sprays a long-term course of macrolide antibiotic may work. A three-month course of erythromycin would be accepted practice in this situation as long as there is no allergy.

Nasal decongestants should be avoided unless there is a flare up of acute rhinosinusitis present.

Douching with hypertonic saline is also beneficial.

Chronic rhinosinusitis with Nasal Polyps

Nasal steroid sprays are very effective in treating the symptoms of CRS with nasal polyps.

Nasal decongestants are not a treatment for nasal polyps.

SURGICAL TREATMENTS

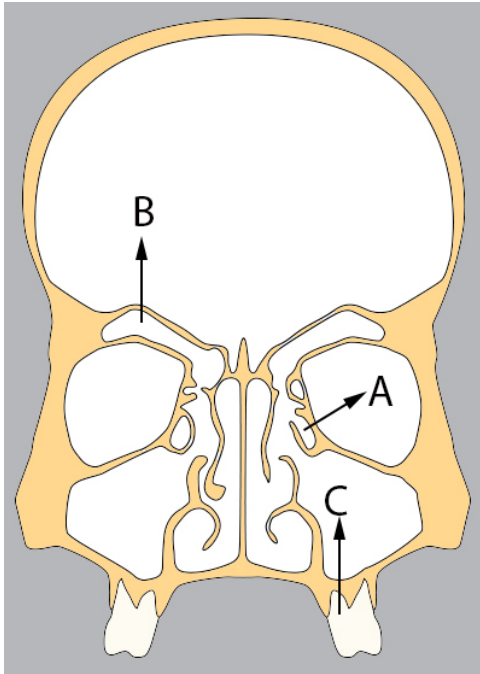
When medical treatments fail to help surgery is considered. The exact operation chosen will vary from patient to patient but it may consist of operations to remove polyps (a polypectomy) or open up the sinuses (functional endonasal sinus surgery) so that they function better. Trimming excessive swelling from the turbinates is also used to unblock the nose.

Surgery is decided upon on a case-by-case basis and the techniques used will depend upon the disease and local expertise and equipment.

COMPLICATIONS OF RHINOSINUSITIS AND NASAL POLYPS

Infections within the sinuses can spread outwards to affect other structures. This does not happen often in the West because antibiotics are easily available. However, in Cambodia it may be more common because antibiotics are prescribed less often.

Infections spread to affect the eye, brain and bones around the sinuses.



Some routes of spread of infection:

A is from the ethmoid sinuses into the orbit;
B is from the frontal sinus into the brain;
C is from the teeth into the sinuses.

Complications involving the eye.

Infection can spread easily from the ethmoid sinuses into the orbit. Have a look at the tutorial on the nose and paranasal sinuses to see how this might happen. Once the infection is inside the orbit an abscess (a collection of pus) may form and this can lead to blindness if it is not treated. This disease is more common in children.



The picture shows infection around the eye causing swelling and redness in the eyelid. If left untreated this may develop into an abscess and threaten the vision.

This may have occurred because of infection spreading from the sinuses as in the diagram above.

Patients like this require emergency treatment in hospital. Refer them immediately.

Complications involving the cranial cavity.

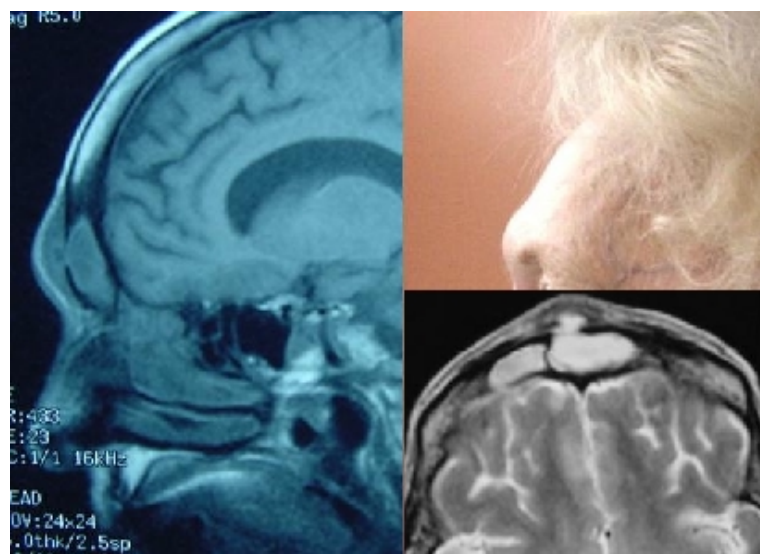
Meningitis, abscesses around or in the brain, and cavernous sinus thrombosis are all complications that can arise if infection spreads out of the sinuses towards the brain. The risk of death from these is very high. Infection typically spreads from the frontal sinuses.



This picture shows a MRI scan of a patient with a frontal brain abscess. These patients also require emergency treatment including antibiotics and surgery. Refer immediately.

Complications affecting bone.

Infection in the frontal sinus can cause a swelling in the forehead known as Pott's puffy tumour. This arises because the skin over the infected bone becomes swollen. Again emergency treatment is required in hospital.



<http://www.ghorayeb.com/PottsPuffyTumor.html>

In the picture above you can see a swelling on the forehead of the patient (top right). The CT scan below this (bottom right) shows pus in the frontal sinus and swelling in the bone of the forehead. The image on the left is a para-sagittal MRI scan that shows both the sinus infection and the swelling in the forehead.



This picture shows a patient with Pott's puffy tumour. This one is very large. If you press upon the swelling with a finger it will leave an impression in the swelling. In medicine this is called 'pitting'.

Learning Points.

1. Rhinosinusitis with or without nasal polyps is very common worldwide.
2. Simple nasal treatments usually work well but compliance and technique of usage are very important.
3. Complications of rhinosinusitis caused by spread of infection are not common but they may be life threatening and you must refer them to your local hospital.