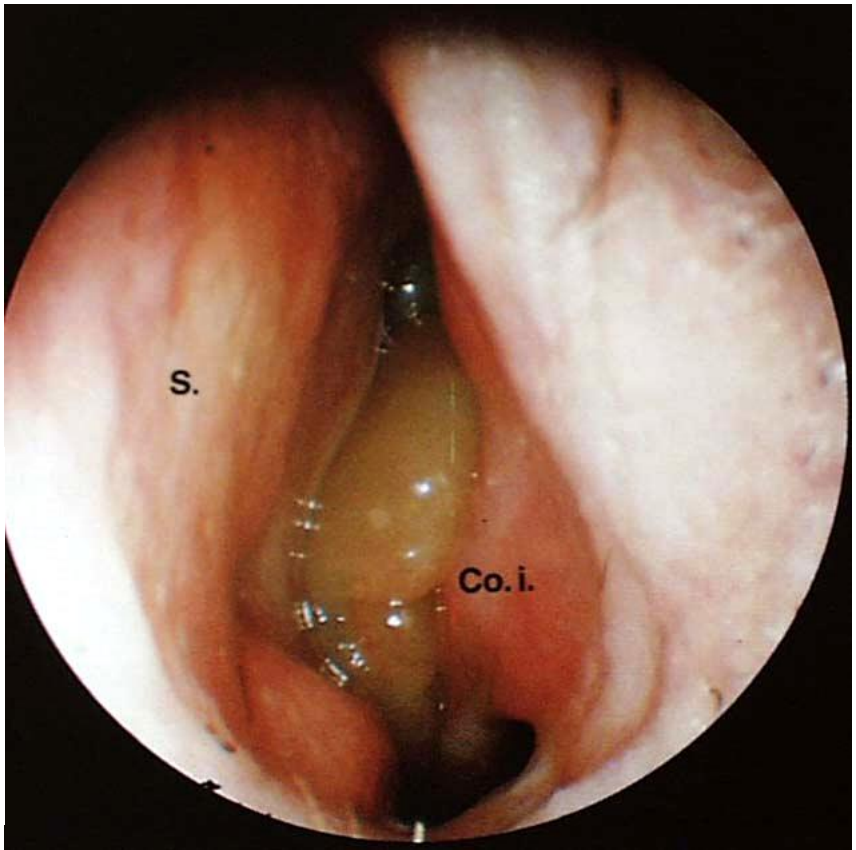
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Nose and paranasal sinuses



Klinika otorinolaryngologie a chirurgie hlavy a krku

Fakultní nemocnice u sv. Anny a LF MU v Brně

Přednosta: Doc. MUDr. Gál Břetislav, Ph.D.

Pekařská 53, Brno , 656 91

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

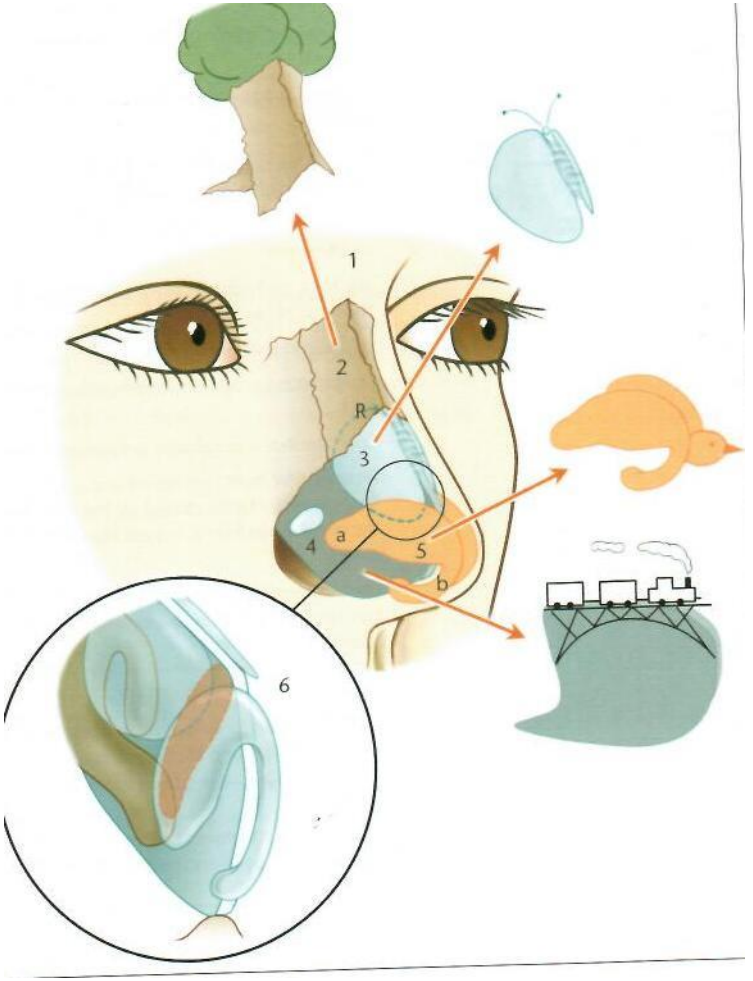
Applied physiology

- **Respiratory** organ – ability to increase exchange of breathing gases 8-90 l/min, aerodynamic shape of the nose
- Perform both physical and immunologic **protection** from the environment, „mucociliar escalator“ – from more than 50 % are filtrated particles from 1 to 10ηm
- **Air-conditioning function** – regulation of temperature on 34^{o} C from -10 into +42 ^{o}C; moisturing – until 80% relative air humidity
- Sensory olfactory organ – **sense of smell**
- Involved in the formation of **speech sounds**
- The nose – major **esthetic** unit in the center of the nose

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

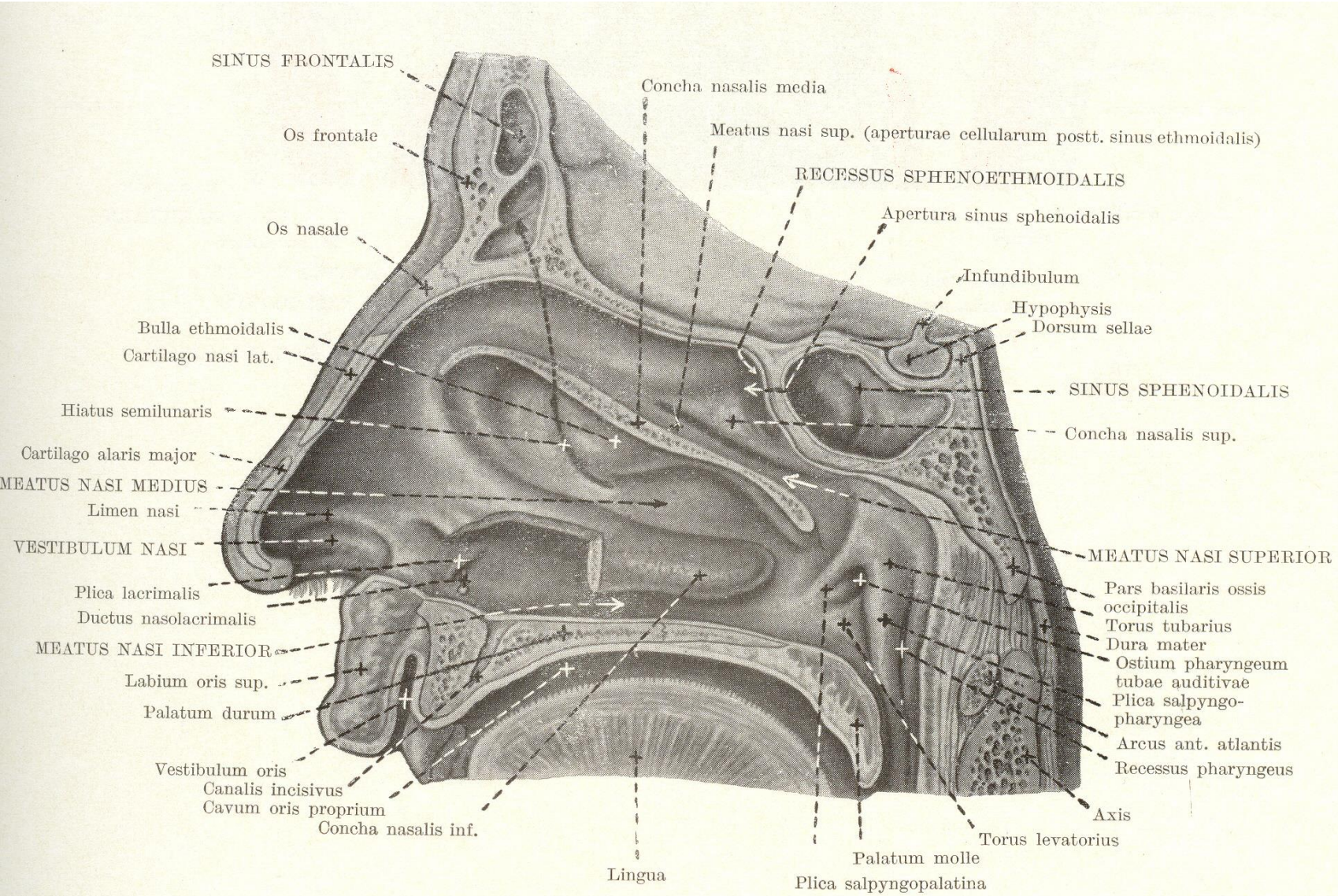
Applied anatomy

- External nose, the nasal skeleton, nasal bone, cartilages
- Nasal cavity (cavum nasi proprium)
  - Vestibulum nasi (the internal nasal valve, „limen nasi“ junction of vestibule and cavum nasi, prominence of the upper lateral cartilage)
  - Meatus nasi inferior, medius, supperior
  - Meatus nasi comunis



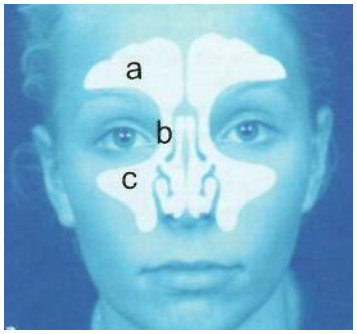
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

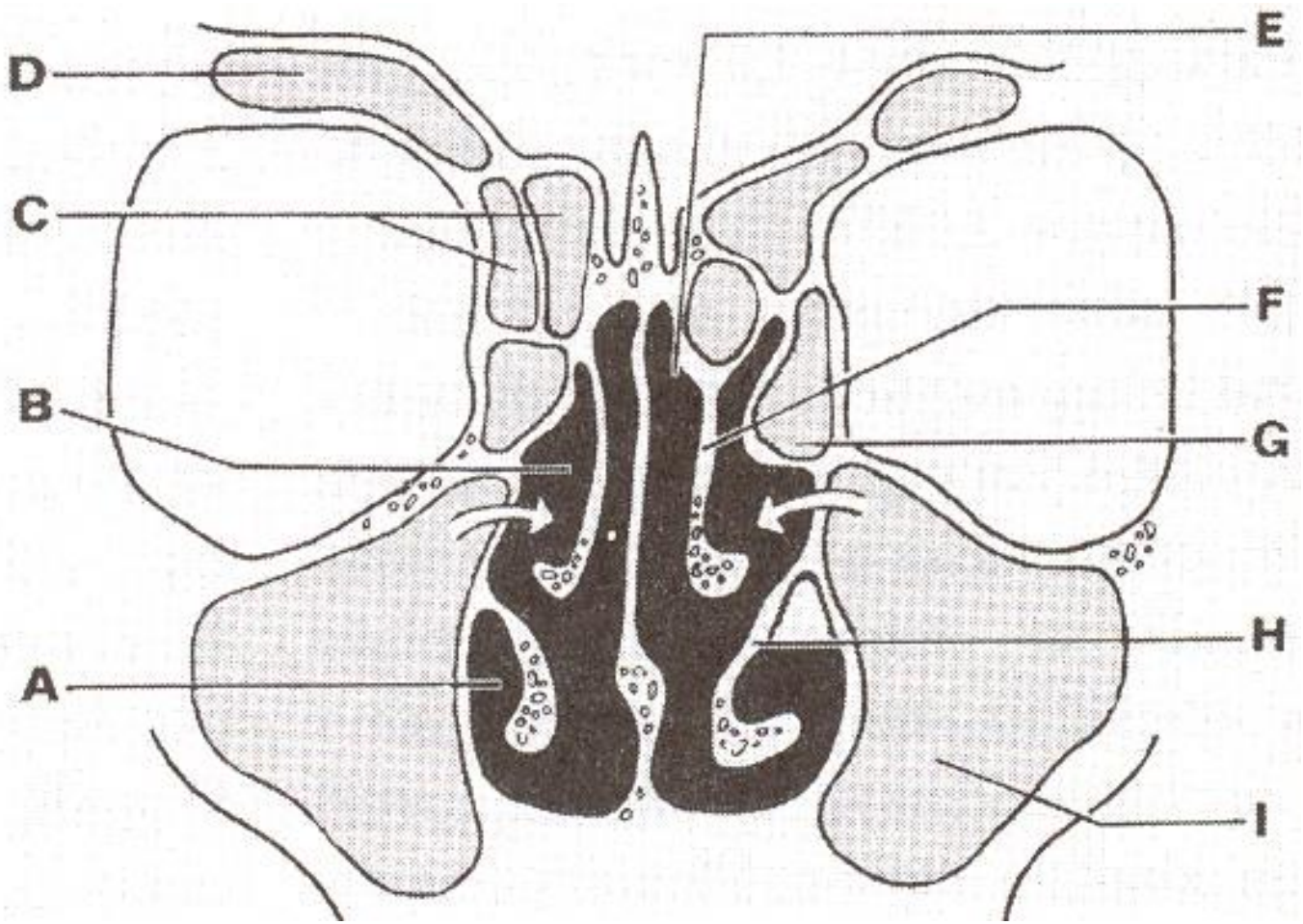
Lateral wall of nasal cavity



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

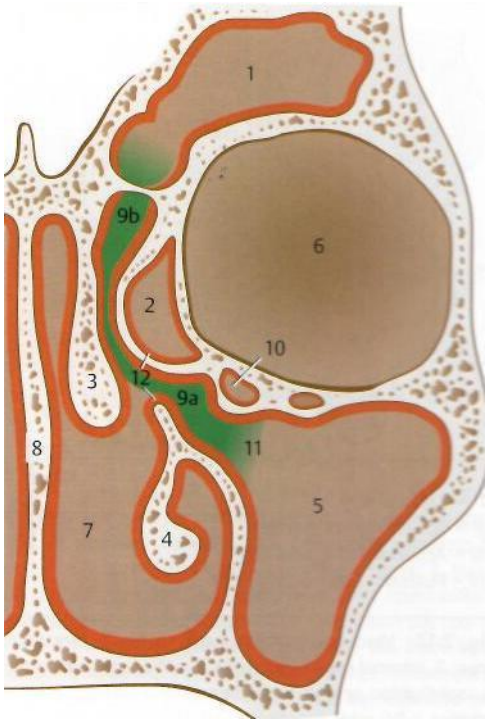
Paranasal sinuses

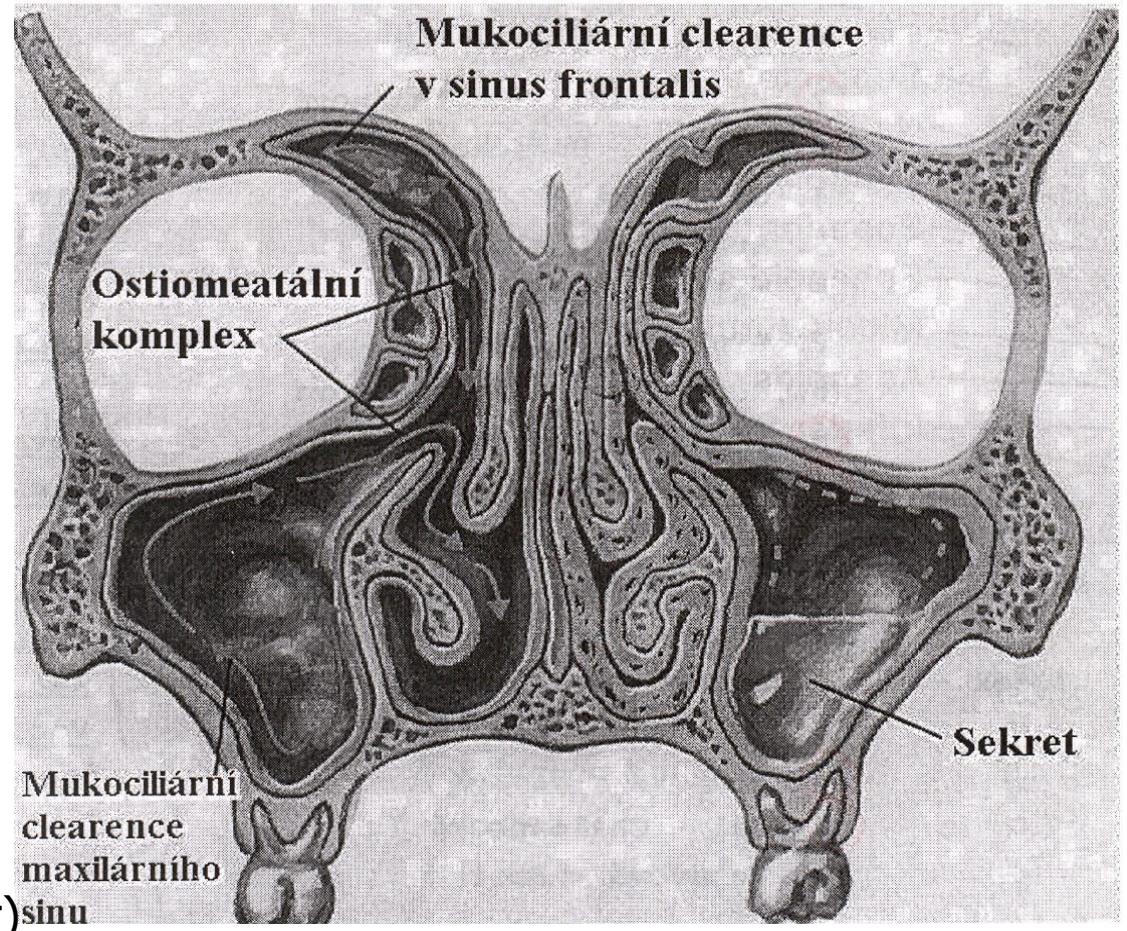




FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Ostiomeatal unit (green)



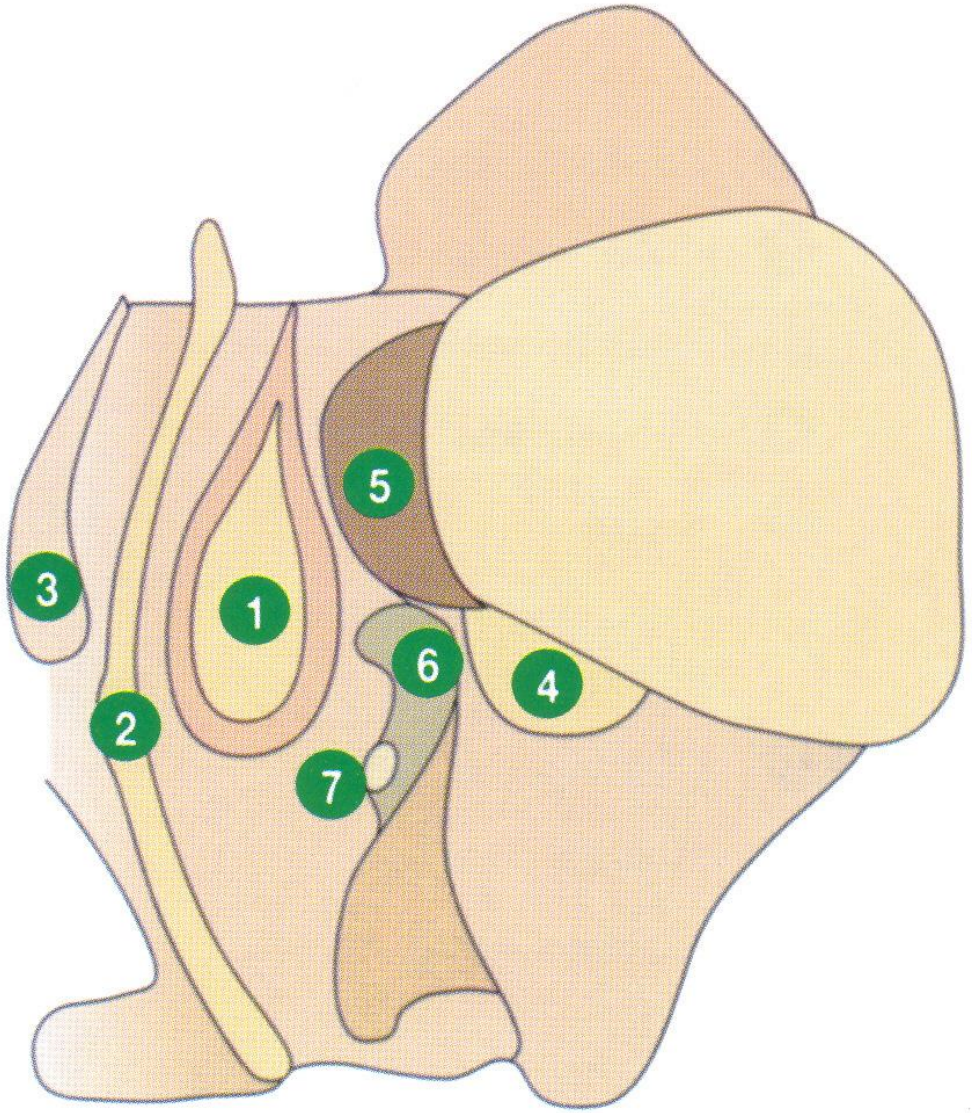


9a ethmoidal infundibulum
9b frontal recess
10 orbital ethmoidal cell (Haller)
11 natural ostium
12 semilunar hiatus

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Anatomical variations causing dysfunction of ostiomeatal complex

1. Concha bullosa
2. Deviace septa
3. Paradoxně zakřivená střední skořepa
4. Hallerovy buňky
5. Prominující etmoidální bula
6. Deviace processus uncinatus
7. Akcesorní ostium maxilární dutiny



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Upper third nasal cavity blood supply from

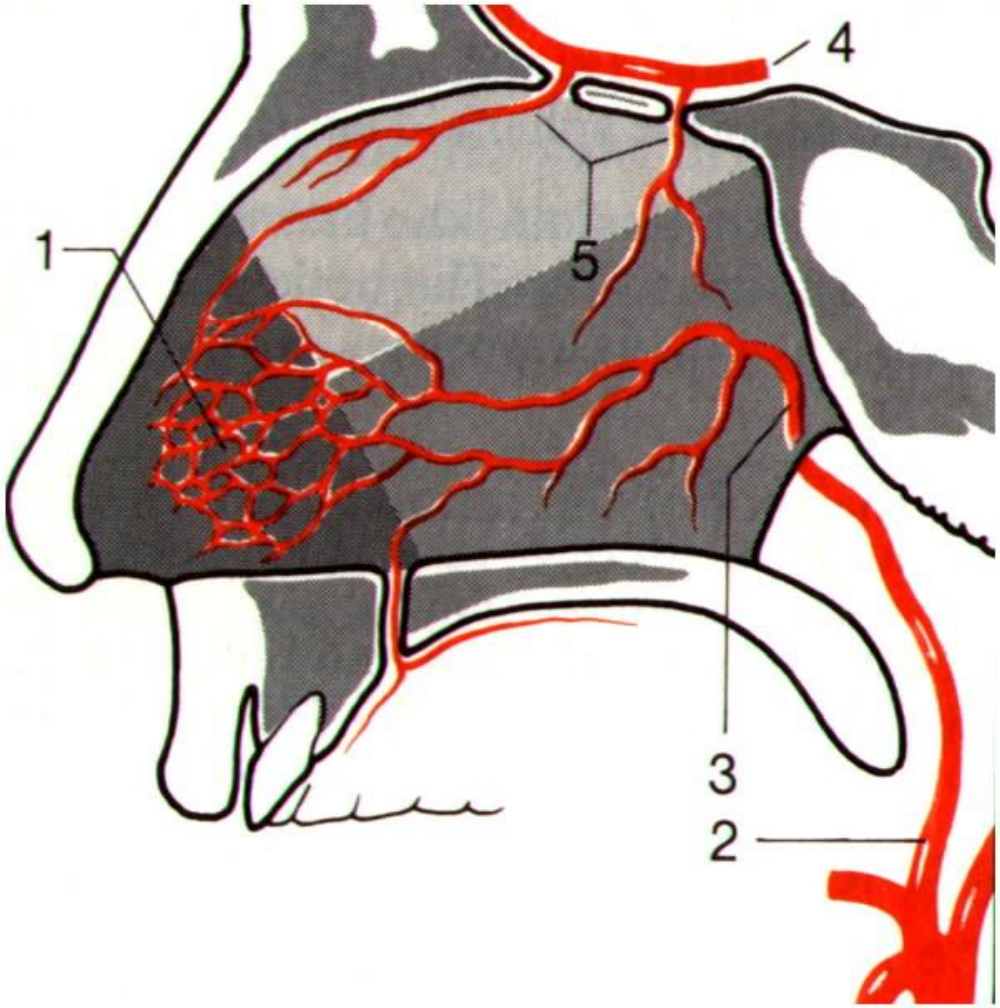
a. carotis interna- *a. ophthalmica-a. ethmoidalis anterior a posterior .*

Posterior and inferior nasal cavity a. carotis externa via *a. maxillaris and a. sphenopalatina - a.a. nasales posterores lat. et septi.*

A. carotis externa - *a. maxillaris - a. palatina descendens - a. palatina maior- a. nasopalatina.*

Locus Kiesselbachi (plexus)

Nasopharyngeal Woodrof plexus

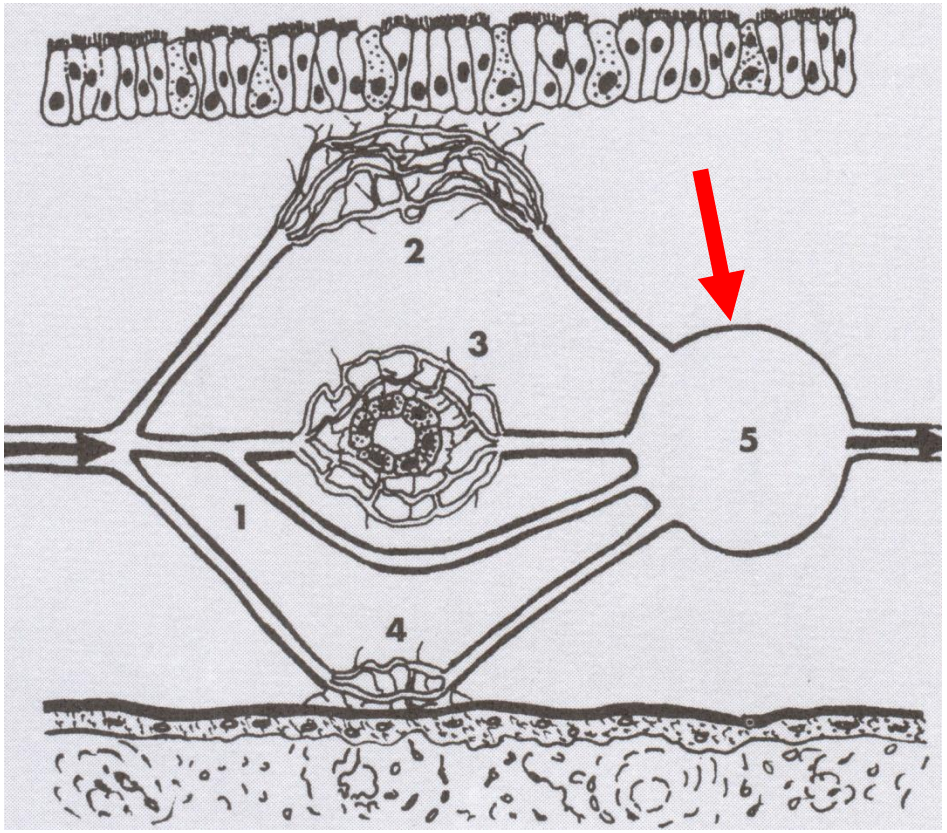


1-Locus Kiesselbachi
2-a.maxillairs
3-a.sphenopalatina
4-a.ophthalmica
5-a.ethmoidalis ant. et post.

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Venous sinusoids (cavernous venous plexus)

Localised between capilars and venules – surrounded by smooth muscles, which causis their vasodilatation and vasoconstriction…



1.Arteriolovenose short circuit 2.subepithelial capillary plexus 3. capillars sorrounding gland 4. periostal capillars 5. cavernous venous plexus

Fibres of smooth muscles of arteriols and venous plexus supplied by autonomes nervoous system.

Parasympathetic stimulation

- **vasodilatation**, filling of venous plexus with blood – congestion a discharge.

Sympathetic stimulation

- **vasoconstriction**, leading to empty venous plexus with blood – not blocked nose and lower discharge.

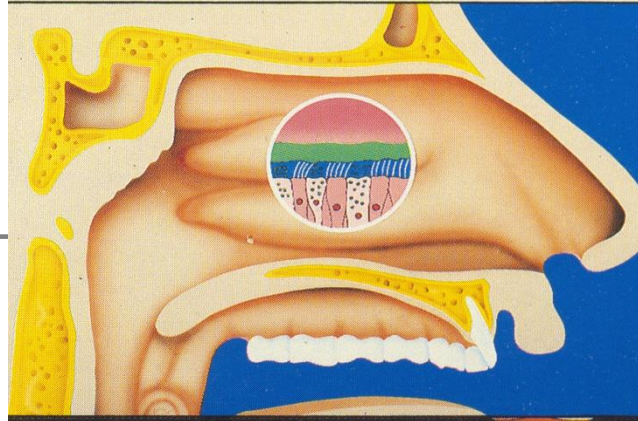
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

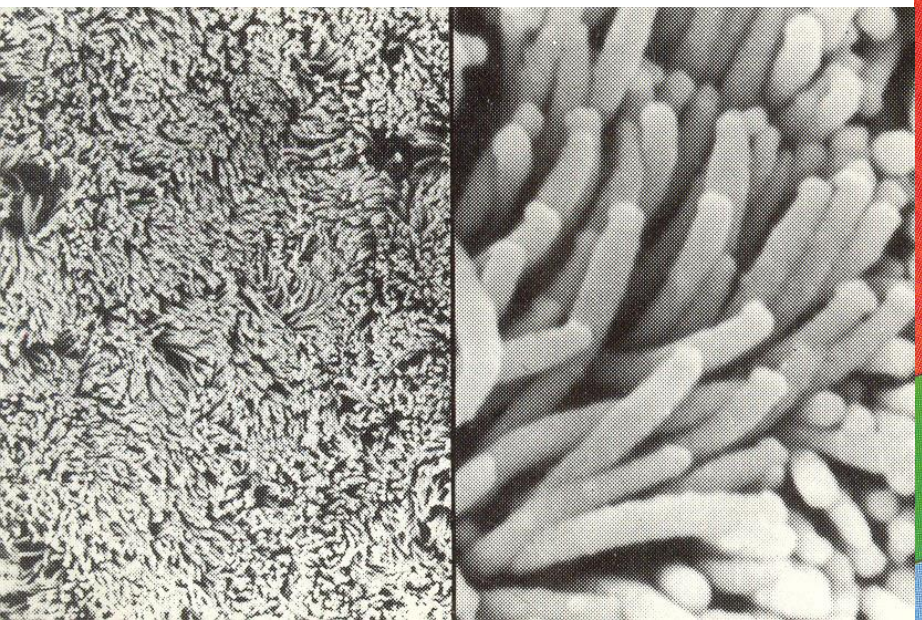
Transmitter acting in physiology and patophysiology nasal mucose membrane

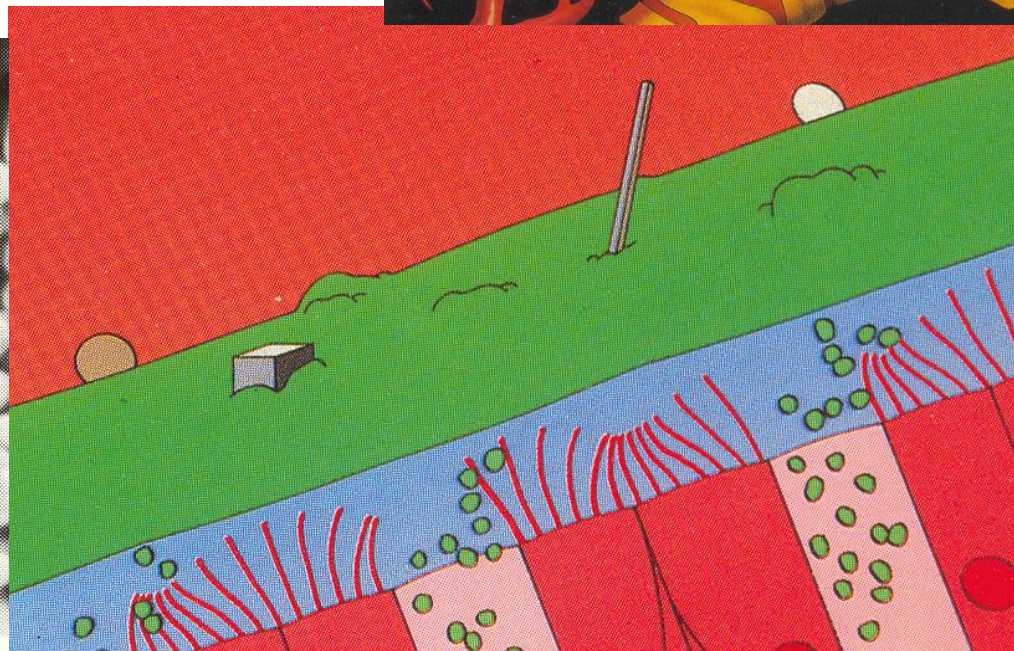
Inervation	Neurotransmitter	Influence on nasal mucose membrane
sympathetic	norepinefrin, neuropeptide Y	vasoconstriction dekongestion
parasympathetic	acetylchlorin vasoactive intestinal polypeptid (VIP)	Increase of nasal secretion vasodilatation nasal obstruction
sensoric (ggl. trigeminale, fibre to seromucinous glands and vessels)	P substance	vasodilatation nasal mucous membrane swelling increased vessel permeability

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Epithelium of the nose: respiratory epithelium columnar-ciliated with goblet cells and a layer of mixed glands „Mucociliar escalator“







FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Evaluation of nose and paranasal sinuses

- aspection, palpation
- rhino-endoscopy
- ultrasound
- radiology (X-ray examination), CT, MRI
- sinoscopy
- lavage of the sinuses
- (diaphanoscopy)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Evaluation of nose function

Mucociliar transport – sacharin test

Smell – olfaktometry

Patency

- **Glatzell desk**
- **Rinomanometrie**

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Olfactory organ – applied physiology

- **Gustatory olfaction** – sensory impressions caused by food (aroma, bouquet) search and food intake. Perception of impulses from external environment are mediated with **smell, trigeminal nerve and taste** - **chemosenzoric perception**
- Protective function – warning against poisenous foods and toxic substance
- Social communication (psychology, occupation…)
- Symptom of some psychiatric disorders

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Applied anatomy of olfactory sense

peripheral and **central** part

1) **peripheral part**: ***olfactory mucosa (regio olfactoria)***

fila olfactoria

localised: c. nasi superior, cranial part of c. nasi media and septum

olfactory mucosa: smell, supporting and basal cells

fila olfactoria: fibres of the olfactory nerv connected with axons of olfactory cells, go through lamina cribriformis into bulbus olfactorius

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

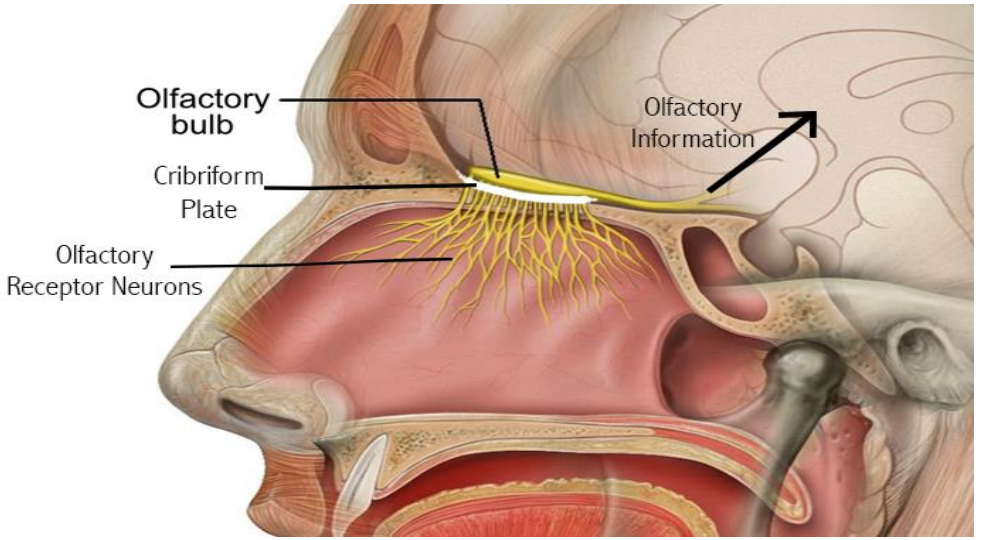
Applied anatomy of olfactory sense

2) central part:

bulbus olfaktorius **-** connection and smell stimulus processing

olfactory cortex - primary olfactory cortex (piriformní kortex, amygdala)

- secondary olfactory cortex (parahippocampus and limbic systém)



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Diagnosis of olfactory disorder

- **History of disease** injuries, surgery of nose and paranasal sinuses, surgery of brain, inflammations, toxic influences, medication, neurodegenerativ, psychiatric and metabolic disorder.
- **ENT investigatios** rhinoscopy, rhinoendoscopy
- **Subjective methods of evaluation of smell**
- **Objective methods *of evaluation* of smell -** EEG with olfactory evoced potentials, elektroolfactogram and functional magnetic resonance (research)
- **Imagination evaluations** CT, MR

Evaluation of smell: subjective methods

- **Sniffin´ stick test** – threshold (the lowest concentration) and supra-treshold tests (discrimination of odours)

- ***test of odoured marker (pen)s -*** screening supra-threshhold evaluation

  1. part – name the odour (points)
  2. part – identification of odour

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Olfactory disorder

Time viewpoint: ***acute, chronic a fluctuate***

Etiopathogenetic viewpoint: ***conductive – peripheral*** odour cannot influence olfactory epithelium, **sensorineural - central** diorder of olfactory perception

- ***conductive disorder*** – one-, bothsided

  1. *mechanical obstruction of nasal cavity* (septal deviation, rhinitis, nosal polyposis, tumors of nose and paranasal sinuses)

  2. patologic changes outside nasal cavity (choanal atreisia, adenoids , tumours of epipharynx, pts after total laryngectomy)

- **sensorineural disorders**

  1. disorders in ***olfactory epithelium*** (viral damage, inhalatiom of toxic odours, rhinitis atrophica, A avitaminosis)

  2. disorders in central parts – ***in olfactory pathway, olfactory cortex*** (congenital diseases, injury, diabetes mellitus, tumors etc.)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Olfactory disorder

Quantitative disorders: partial loss of smell – ***hyposmia*** to ***anosmia***

Qualitative disorders : change of perception of disorder

parosmia – distorted perception of odour
specific anosmia – unability of perception of some odours
fantosmia - perception of some odours even in their abscence

kakosmia – *upleasant* perception of odours *(graviditas, mb. Parkinson)*

Therapy

conductive disorder

- ***Conservative treatment:*** corticosteroids systémově a lokálně, čichový trénink a zlepšování ventilace nosem
- ***Surgery:*** chronic rhinosinus with nasal polypoisnot reacting on concervative treatment– FESS, removal of nasal obstruction in tumors and anatomical deformities

sensorineural disorders cannot be treated, diagnosis could reveal life threatening diseases which could be treated

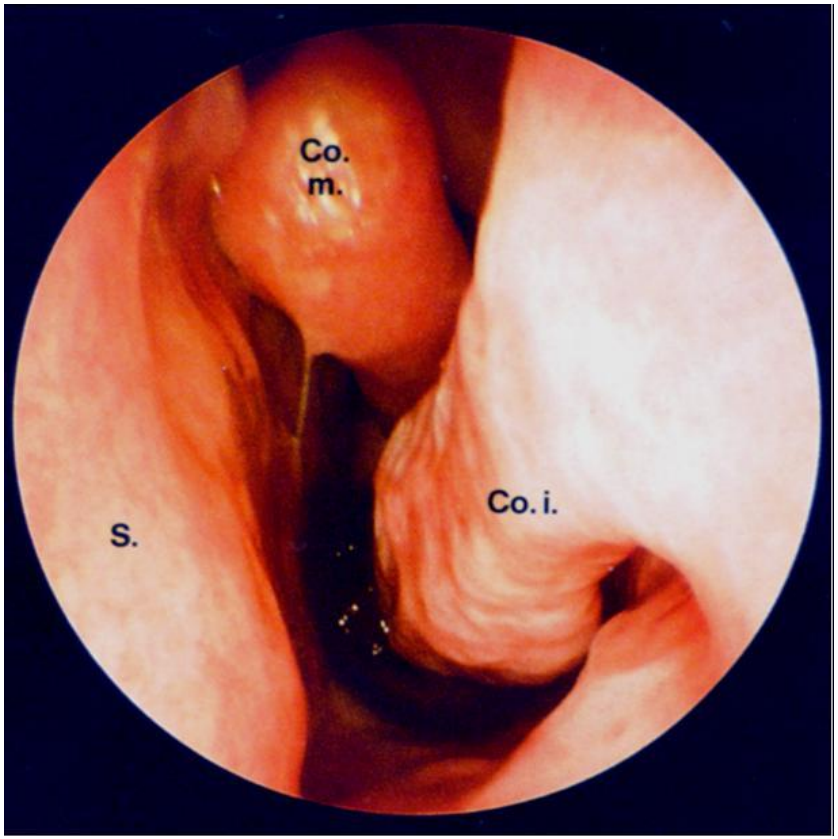
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

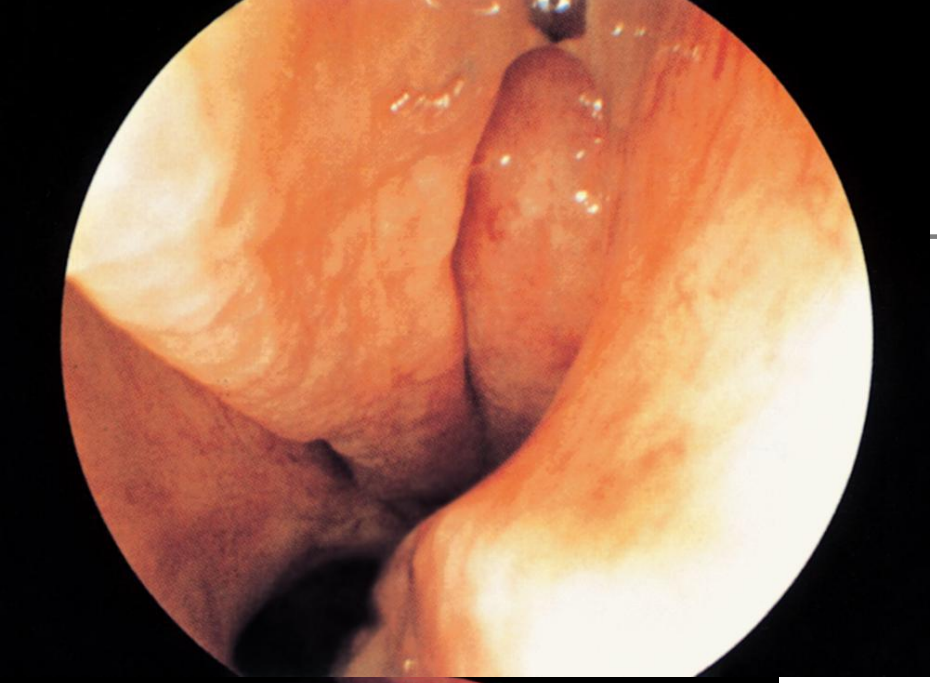
Olfactory disorder

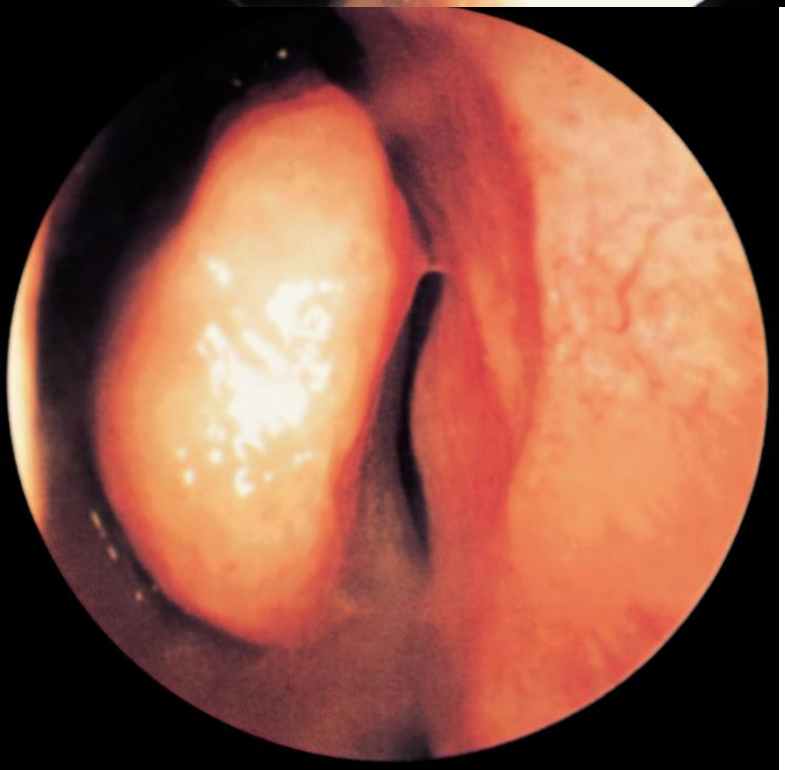
Congenital diseases	congenital	Choanal atresia
		Cystic fibrosis
		Primary ciliary dyskinesis
		ASA syndrome
		Meningocele, meningoencefalocele
	Ostatní	Septal deformities
Inflammatory diseases	Infectious	Viral
		Bacterial
		Mycotic
	Non-infectious	Alergy
		Non-alergic – nosal polyposis, medicamentous rhinitis
Tumors	Benign	Papilloma, inverted papilloma
		Juvenil angiofibroma, hamartoma
	Malignant	Epithelial – spinocellular cancer, adeno-cancer, melanoma
		Mezenchymal – plazmocytoma, chondroma, chondrosacoma
		Neuroectodermal – olfactory neuroblastoma
Injuries	Injuries of face skeleton	Injuries of middle etage
		Injuries of superior etage
	Injuries of base of the skull	Frontobasal injuries

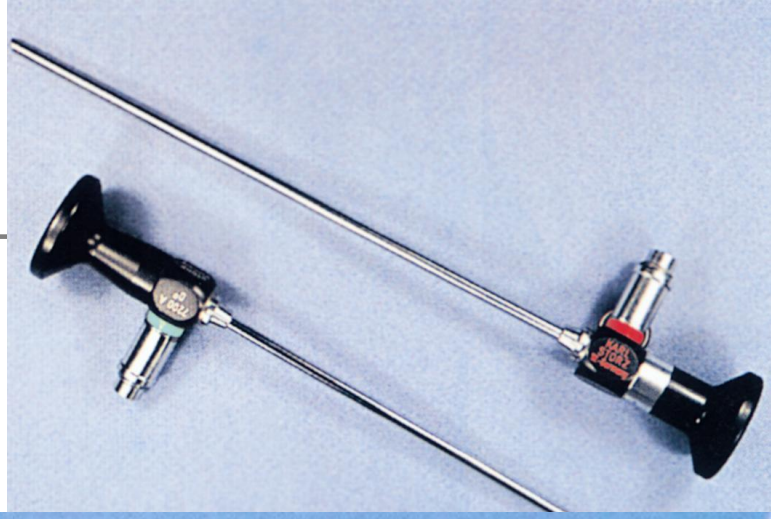
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

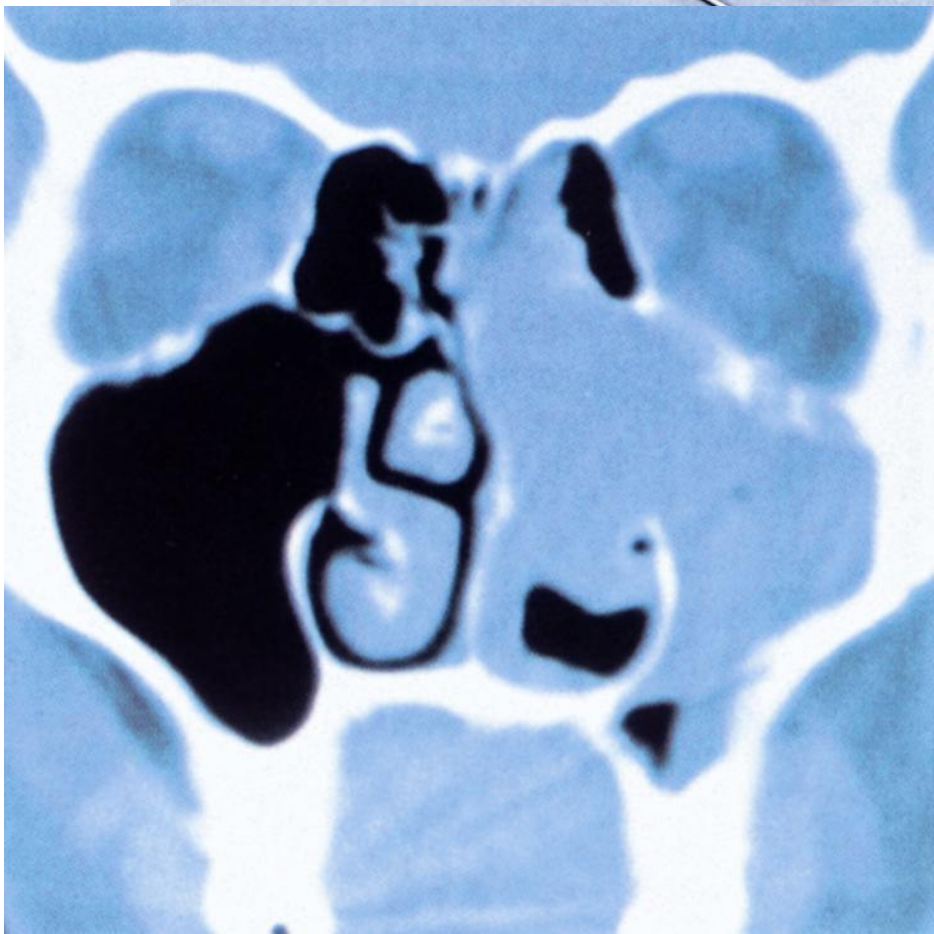
Endoscopy











FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

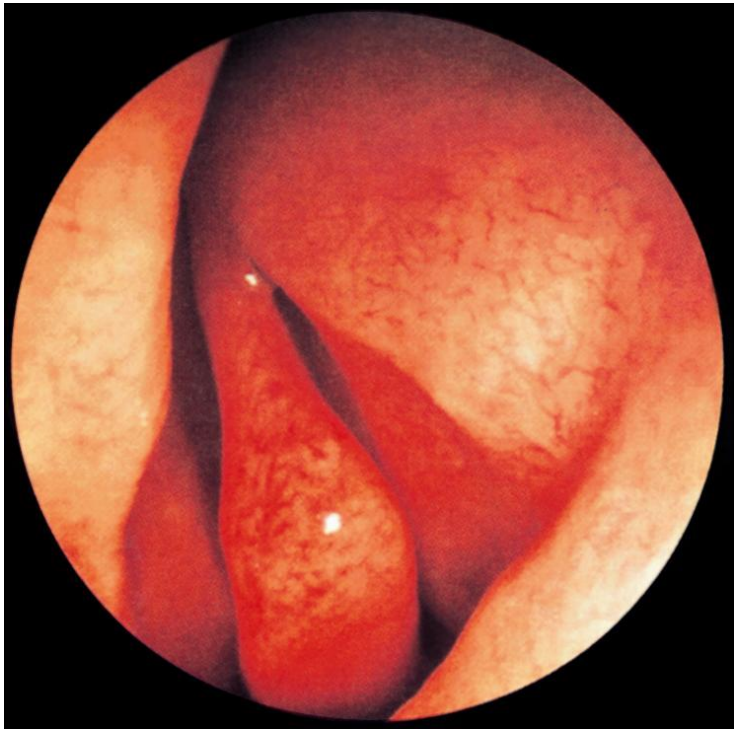
Physiologic endoskopic view

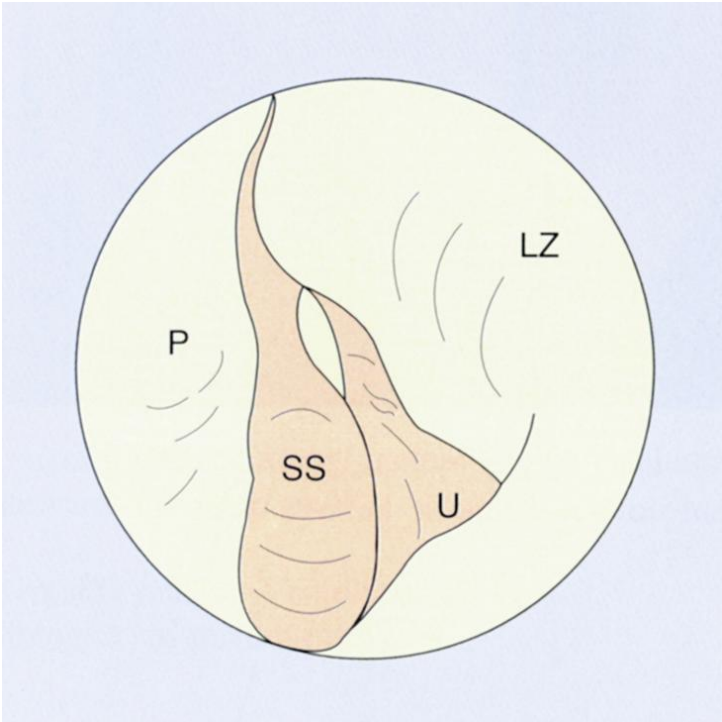
LZ – sulcus lacrimalis

U – processus uncinatus

SS – middle turbinate

P – nasal septum



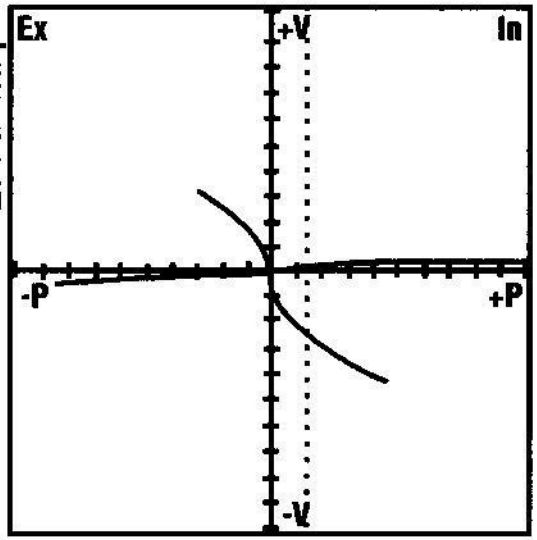


Rhinogram of septum deviation to the right and narrowing of nasal valve

Press.	75	150	300
Fl, .L	156	240	328
Fl, .R	8	4	12
Fl, .L+R	164	244	340
Fl, .L/R	19.50	60.00	27.33
Fl, IncL		53	36 %
Fl, IncR		-50	200 %
Res L	0.48	0.62	0.91
Res R	9.37	37.50	25.00
ResL+R	0.45	0.61	0.88

Flow: ccm/s
Press: Pa

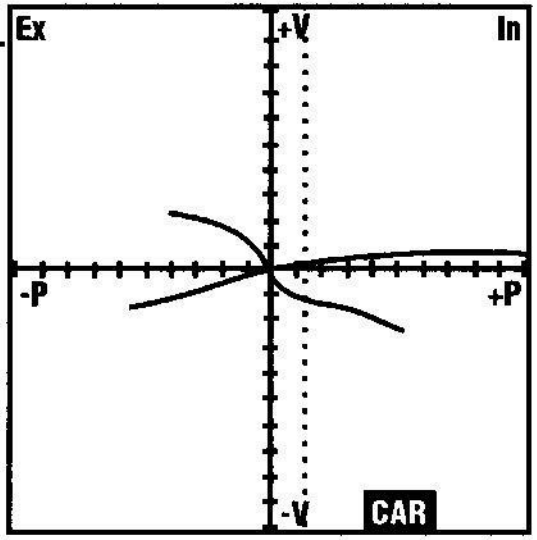
⊞± 1000 Pa, ccm/s
✚± 100 Pa, ccm/s



Press.	75	150	300
Fl, .L	96	116	156
Fl, .R	16	36	68
Fl, .L+R	112	152	224
Fl, .L/R	6.00	3.22	2.29
Fl, IncL		20	34 %
Fl, IncR		125	88 %
Res L	0.78	1.29	1.92
Res R	4.68	4.16	4.41
ResL+R	0.66	0.98	1.33

Flow: ccm/s
Press: Pa

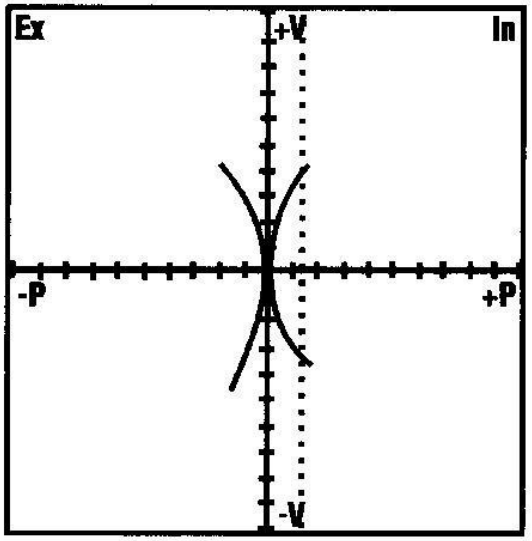
⊞± 1000 Pa, ccm/s
✚± 100 Pa, ccm/s



Press.	75	150	300
Fl, .L	232	324	0
Fl, .R	264	488	0
Fl, .L+R	496	732	0
Fl, .L/R	0.87	0.79	
Fl, IncL		39 - 100	%
Fl, IncR		54 - 100	%
Res L	0.32	0.46	
Res R	0.28	0.36	
ResL+R	0.15	0.20	

Flow: ccm/s
Press: Pa

⊞± 1000 Pa, ccm/s
✚± 100 Pa, ccm/s

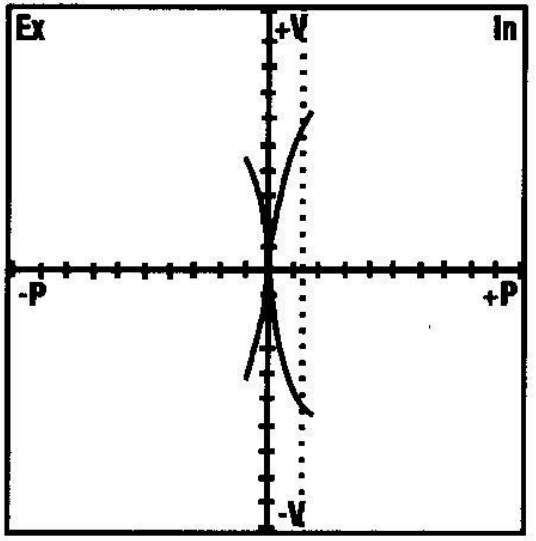


Rhinogramm with normal values

Press.	75	150	300
Fl, .L	484	536	0
Fl, .R	404	612	0
Fl, .L+R	888	1148	0
Fl, .L/R	1.08	0.87	
Fl, IncL		32 - 100	%
Fl, IncR		51 - 100	%
Res L	0.18	0.27	
Res R	0.18	0.24	
ResL+R	0.09	0.13	

Flow: ccm/s
Press: Pa

⊞± 1000 Pa, ccm/s
✚± 100 Pa, ccm/s



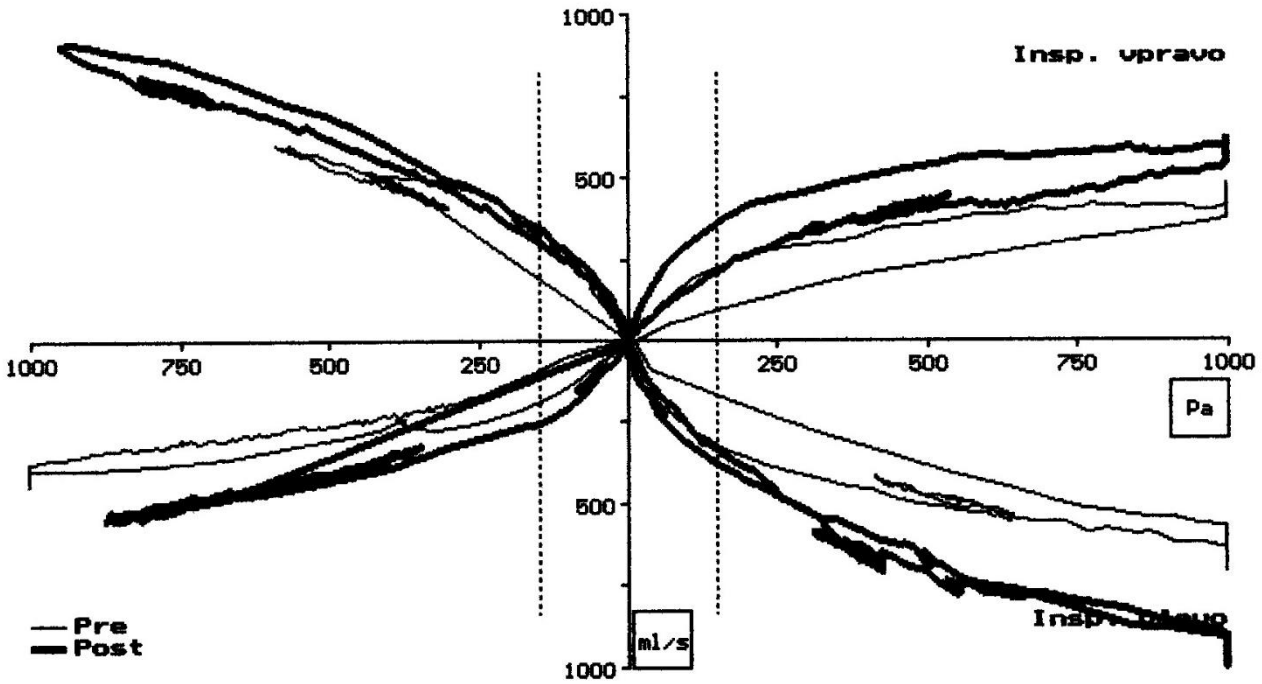
Rhinogram normal values after anemisation

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

FN U sv. Anny
Pekarska 53, klinika pracovniho lekarstvi
prednosta Doc. MUDr. Petr BRHEL CSc.
tel. 05/43182886

Protokol mereni Rhinomanometrie 07.11.2000

ID-cislo...	SimPet100173	Vyska...[cm].	175	Dat.naroz..	10.01.1973 = 27r
Prijmeni...	Simon	Vaha....[kg].	65	Pohlavi.	muz
Jmeno...	Petr	Poznamka.....	Koureni:10/d,riziko:0,leky:0		

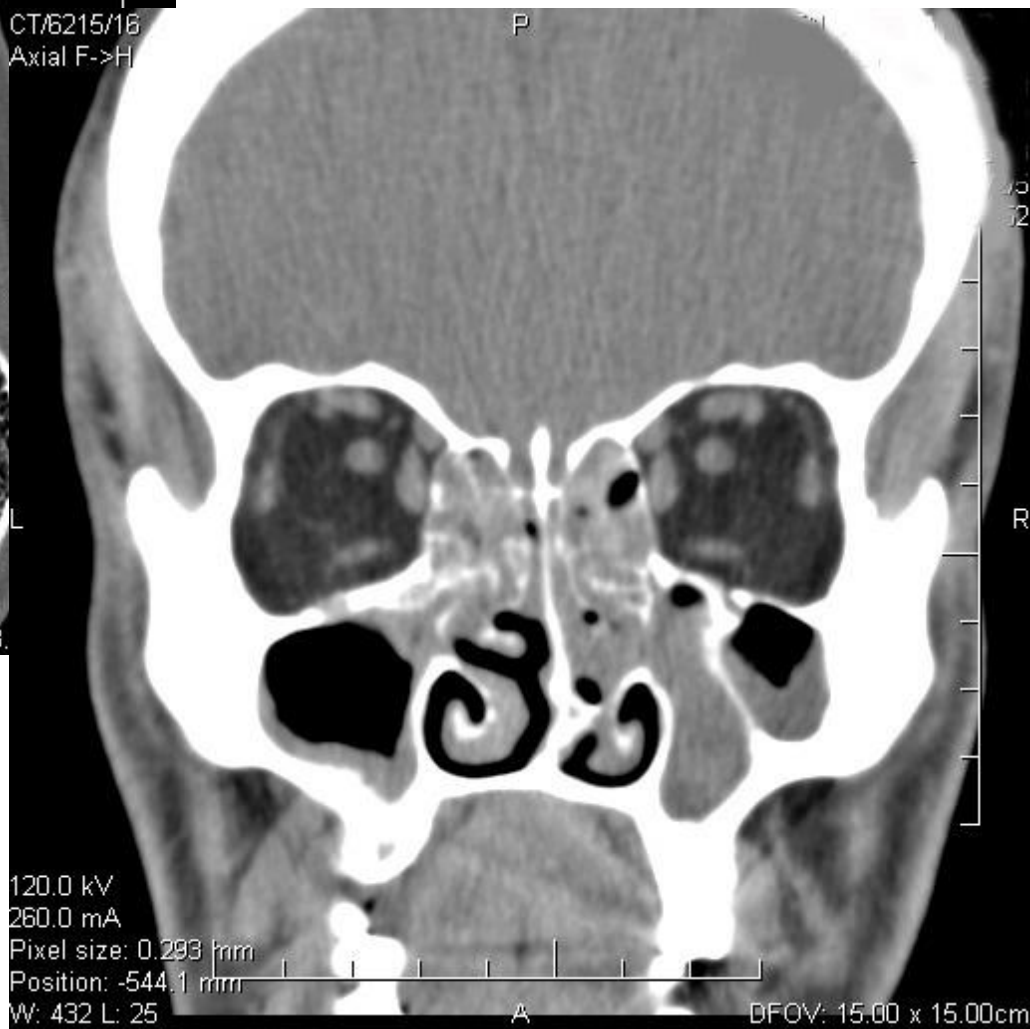


Merene hodnoty

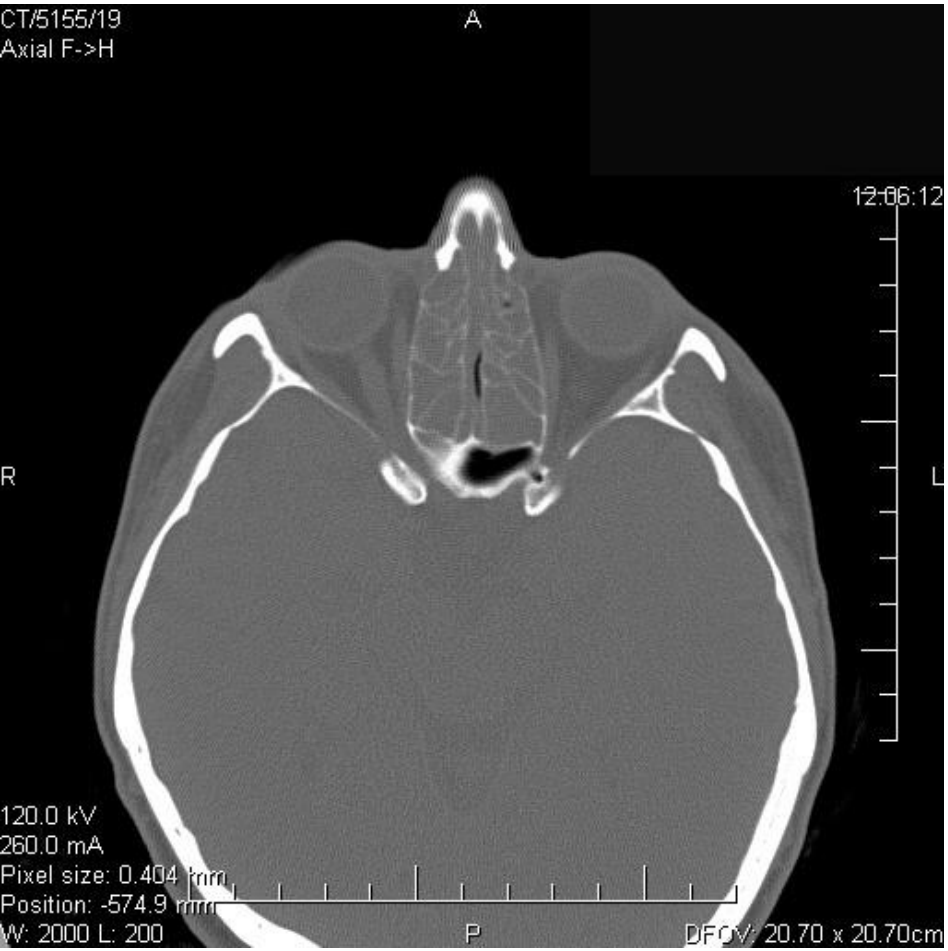
Parametr		Nal.hodn	Pre-hodn 07.11.2000 10:01	Pre/Nal.[%]	Hodn. Post 07.11.2000 10:31	Post/Nal.[%]	Post/Pre[%]
L150	ml/s	450	250	56	351	78	+41
R150	ml/s	450	171	38	292	65	+71
SUM150	ml/s	900	421	47	644	72	+53
RES-L150	Pa/ml*s		0.60		0.43		-29
RES-R150	Pa/ml*s		0.88		0.51		-42

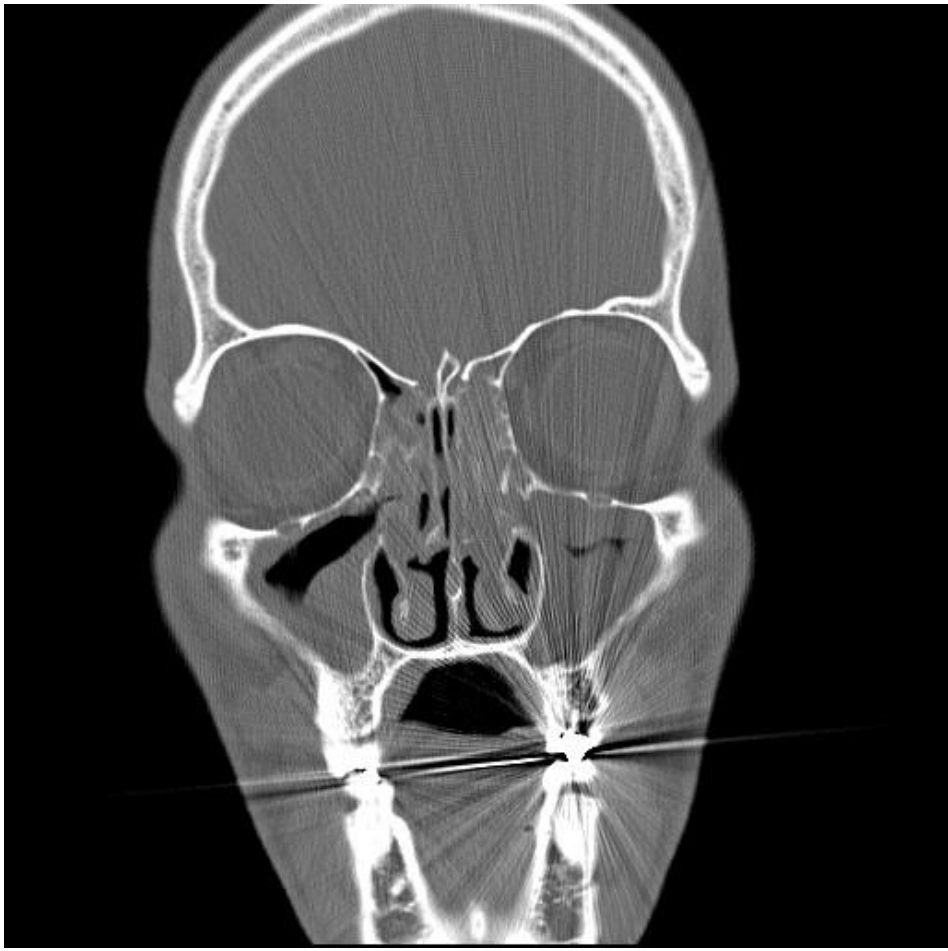
FAKULTNÍ
NEMOCNICE
U SV. ANNY
V BRNĚ

Počítačová tomografie



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Clinical definition of rhinosinusitis in adults

Inflammation of the nose and the paranasal sinuses characterized by two or more symptoms,

one of which should be either **nasal blockage**/obstruction/congestion

or **nasal discharge** (anterior/posterior nasal drip). Another symptoms:

- ± **facial pain/pressure**
- - ± reduction or **loss of smell** and either
- and
- endoscopic signs of: - nasal polyps, and/or - mucopurulent discharge primarily from middle meatus and/or - oedema/mucosal obstruction primarily in middle meatus
- and/or
- CT changes: - mucosal changes within the ostiomeatal complex
- Symptoms should last until 12 weeks in **acute rhinosinusitis** and at least 12 weeks in **chronic rhinosinusitis**.

EPOS 2012: European position paper on rhinosinusitis and nasal polyps 2012 (Witske Fokkens, Valeria Lund et al.)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Classification of rhinosinusitis

1. Alergic

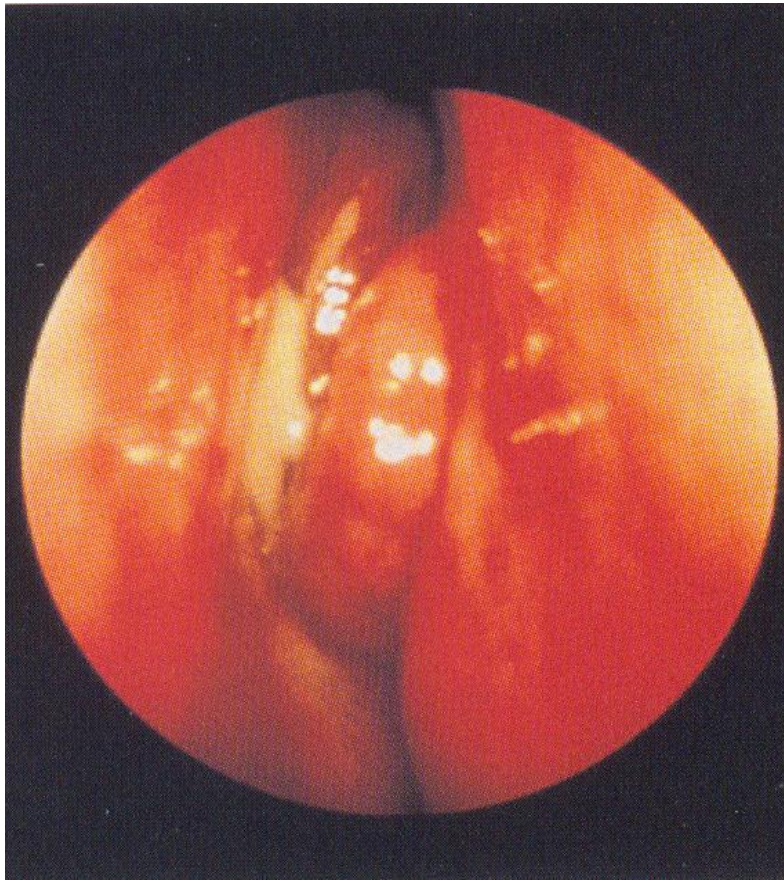
- Intermitent
- Persistant

2. Infectious

- acute
- chronic
  - specific
  - nonspecific

3. Other

- Vasomotor (professional, hormonal, drug inducated, irritant, Alimentáry, psychogenic, NARES (non allergic rhinitis with eosinofilia syndrome)
- Atrophic
- Idiopathic



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Epidemiology of chronic rhinosinusitis

- Allergic and chronic nonallergic rhinosinosinusitis belongs to civilization diseases
- Frequency about 25 % population
- Incidence is higher in town inhabitants
- about 50 % of chronic noninfectious rhinitis is allergic rhinosinusitis

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

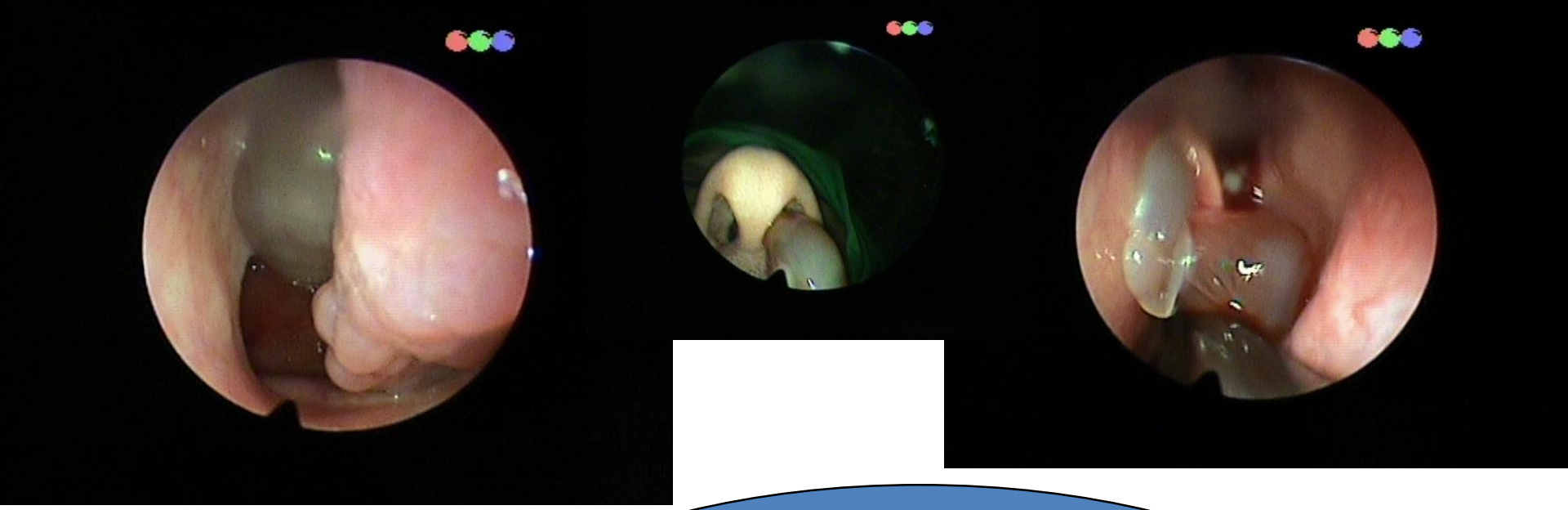
Degree
- mild
- moderate
- sever

Visual analog scale (VAS)

A section 10 cm long

Without symptoms

Most intensive symptoms



Chronic rhinosinusitis

nasal polyposis

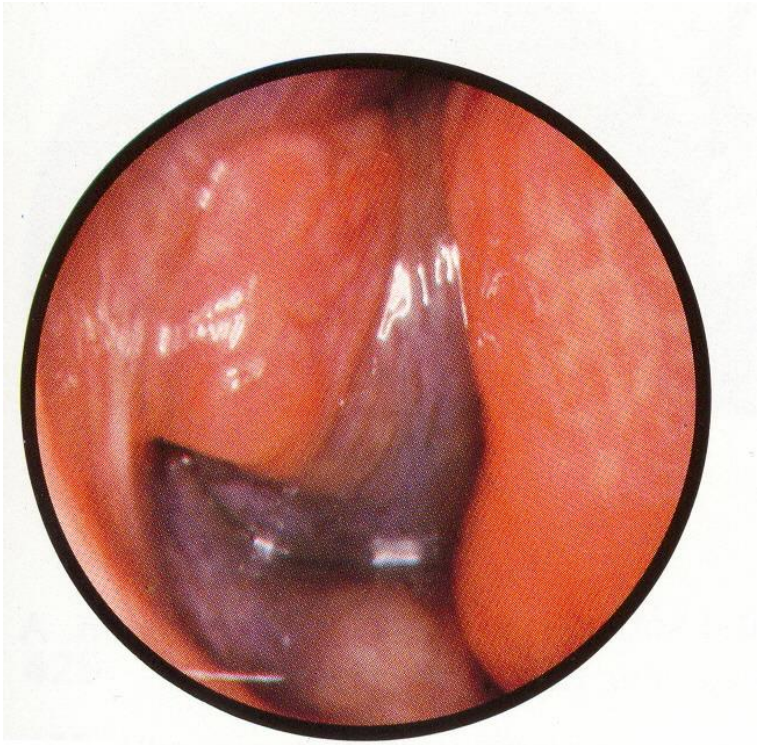
Eosinofilia, IL-5

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Allergic rhinitis

Persistens
Intermitens

Degree
- mild
- moderate
- sever



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Allergic rhinitis

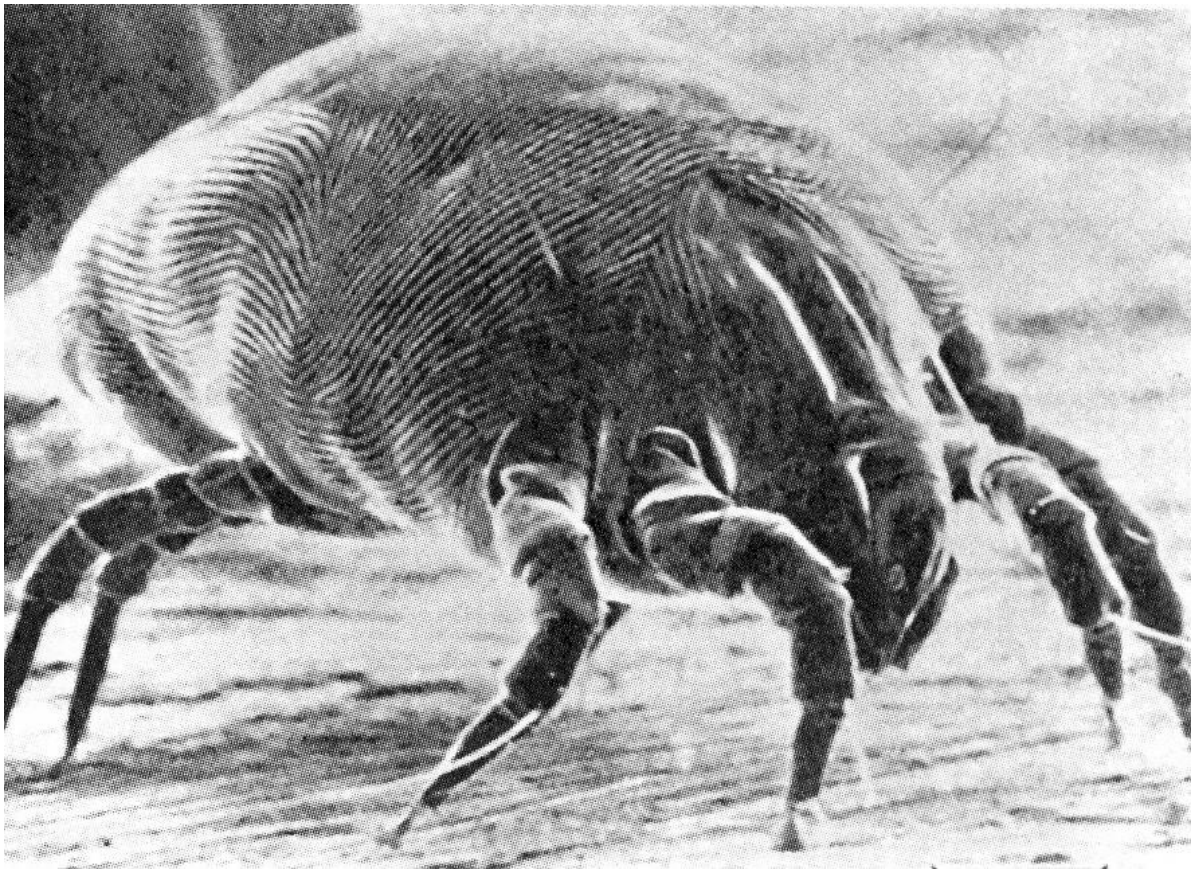
- Proof of IgE – mediated mechanism
- Symptoms as a result of immune reaction mediated by specific IgE antibodies
- Cellular inflammatione of mucose membrane (T-lymfocyty, eozinofils)
- Cause of production of IgE antibodies - atopic genetic predisposition (HLA antigens of atopic patient)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Domestic acarid

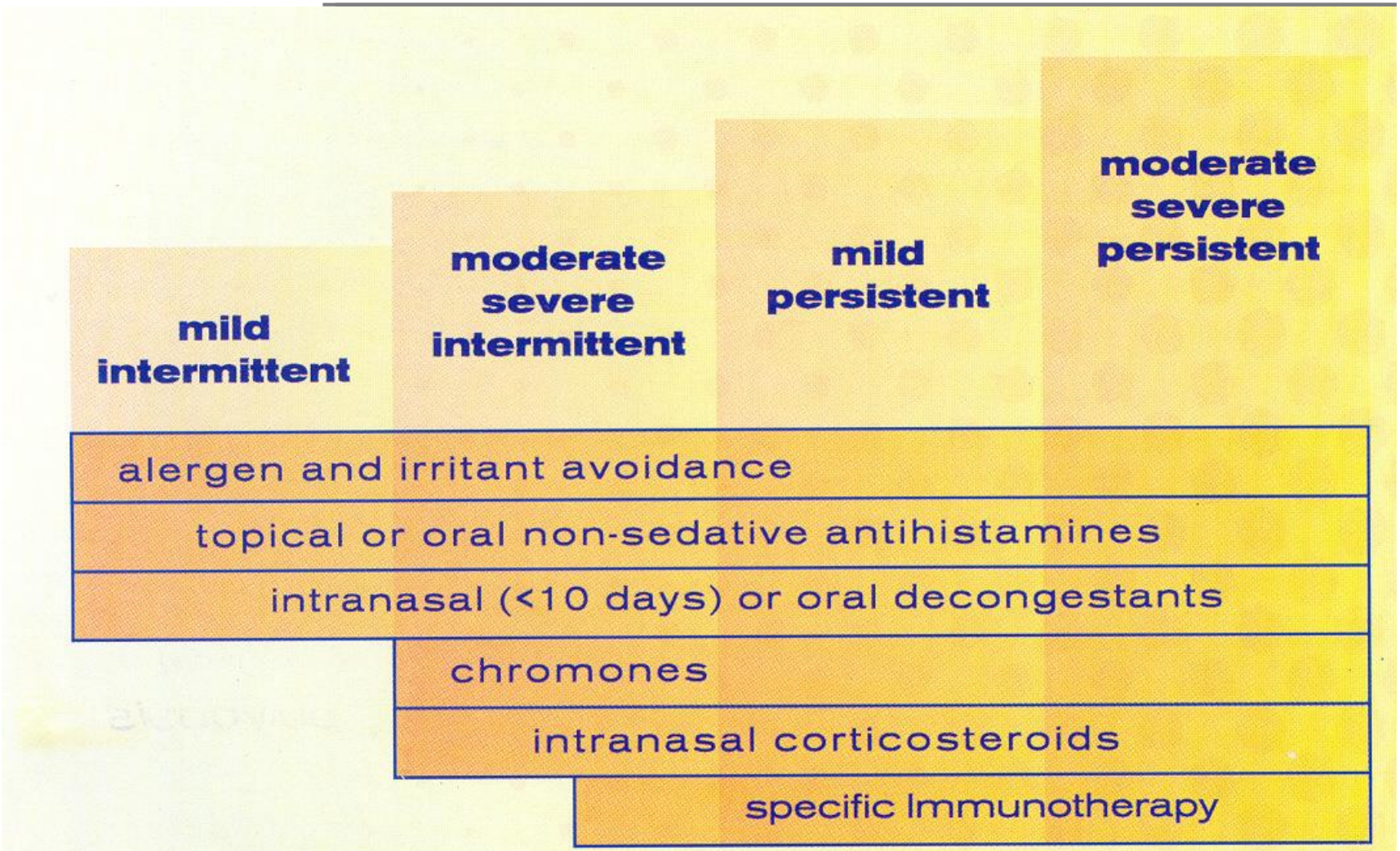
(Dermatophagoides pteronyssinus,
in electron microscope)

The most frequent cause of allergy – „domestic dust“



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rhinitis allergica - treatment



adapted from: Management of Allergic Rhinitis and its Impact on Asthma 2001. (1)

Management of Allergic Rhinitis and its Impact on Asthma. Based on: Bousquet J. ARIA workshop report. J Allergy Clin Immunol 2001; 108 (5): 147-333.

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Comparison of local decongestant

Drug	Time to effect (min.)	lasting of effect (hod.)	Undesirable side affects
Efedrin	10	3-4	+++
Fenylefrin	15	1-2	+++
Nafazolin	15	2-6	++
Xylometazolin	20	10-11	++
Oxymetazolin	20	10-12	++
Tramazolin	5	11-12	+

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rhinitis vasomotorica

- Disorder of mucos membrane without structural backround, not infectious, autoimune neither allergic in traditional sense.
- The same symptomatology as persistans allergic rhinitis.
- Cause- faktors of none-imune character.

(Charles W. Cummings, et al. Otolaryngology—Head & Neck Surgery, Mosby)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Vasomotor rhinitis

- Neurovascular reaction on various stimulus: mechanical, chemical, psychic stress.
- Manifestation of

sympathic-parasympathic neurovascular disbalance

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

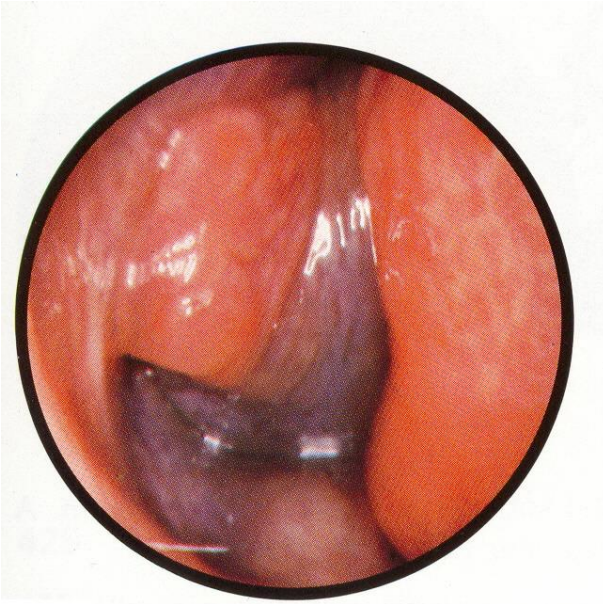
Symptoms of vasomotor rhinitis

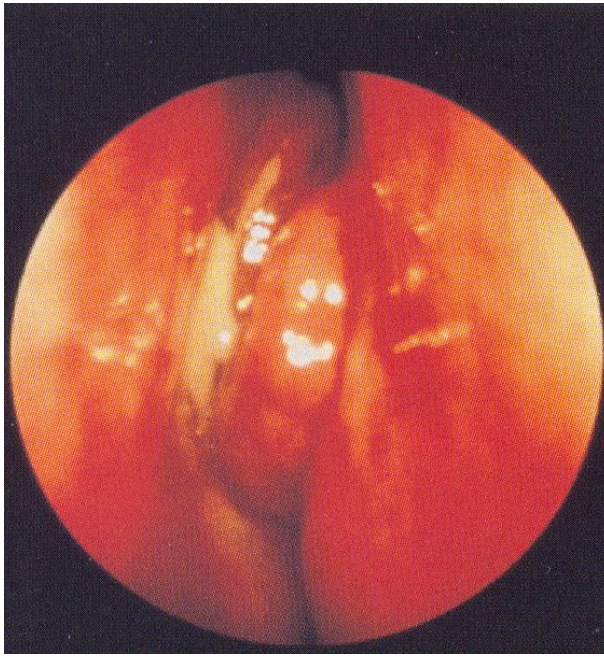
- „blocked nose“
- Watery discharge - rhinorrhea –
  - Výtěr z nosu s velkým množstvím eozinofilů typický pro alergii nebo NARES
  - Žlutý hnisavý – bakteriální infekce (neutrofily)
  - Krvavý nebo krustózní a ulcerace typické pro bakteriální infekci, nádor nebo granulomatózu
- Itching in nose, sneezing
- Smell disorder
- Feeling of dryness in nose
- Eye symptoms
- Headache
- General symptoms

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Anterior rhinoscopy

- Alergic and vasomotor rhinitis livid or pale, diffus swollen mucose
- Irritation or abuse of nasal spray – red mucose
- sinusitis red mucose with pus





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Vasomotor rhinitis – diagnosis

- X-ray evaluation is normal
- Higher amount of inflammatory mediators and cells
  - Histamines, leukotrienes, prostaglandins, neuropeptides aj.
- In nasal secretion not present eosinophils
- Negative skin allergen tests
- Positive answer on histamine skin test

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rhinitis vasomotorica - causes

1. Drug provoked rhinitis
    a. Antihypertensive treatment
    b. abuse of nasal drops/sprays
    c. Cocain
    d. Hormones
2. Pregnancy and ‘‘premenstrual rhinitis’’
3. Hypothyroidisms
4. Emotional causes
5. Temperature changes
6. Rhinitis from irritation and external influences
7. Rhinitis from olfactory perception
8. End phases of vascular atonia in chronic allergic and infectious rhinitis
9. Rhinitis from position
10. Rhinitis in nasal obstruction and nasal cycle
11. Rhinitis in non-ventilated nose (laryngectomy, choanal atresia, vegetationes adenoideae)
12. Compensatory hypertrophic rhinitis
13. Eosinophilic and basophilic nonallergic rhinitis
14. other systemic reasons: syndrome vena cava sup., Horner´s syndrome, cirrhosis, uremia

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Drug provoked rhinitis

- Antihypertensiv drugs - Reserpin, Hydralazin, Guanethidin, Methyldopa, Prazosin, Beta-blockers, Propranolol, Nadolol
- Antidepressiv drugs a antipsychotics -Thioridazin, Chlordiazepoxid and Amitriptyline, Perfenazin
- Hormones - Ovarial hormones, oral contraceptives
- Abuse of nasal decongestants – rebound fenomen rhinitis Prolonged usage of topis vasocontrictors causes loss of vascular tonus. Antidecongestiv nasal drops should by use longer then 3-5 subsequent days
- Cocain - vasoconstrictor

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Pregnancy and "premenstrual rhinitis"

- Higher level of endogenous progesterone – congestion not only in uterus but also in the nose
- From the some reason – immediately before menstruation

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Psychogenic and emotional reasons

- Anxiety, hostility, feeling of frustration a anger – it could disturb autonomic neurovascular balance – nasal congestion and watery discharge
- migraine - dysfunctio in carotic system

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rhinitis from temperature changes

- External temperature influence nasal patency :
  - Warm causes vasodilatation (congestion)
  - Cold air causes vasoconstriction

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rinitis from olfactory sensation

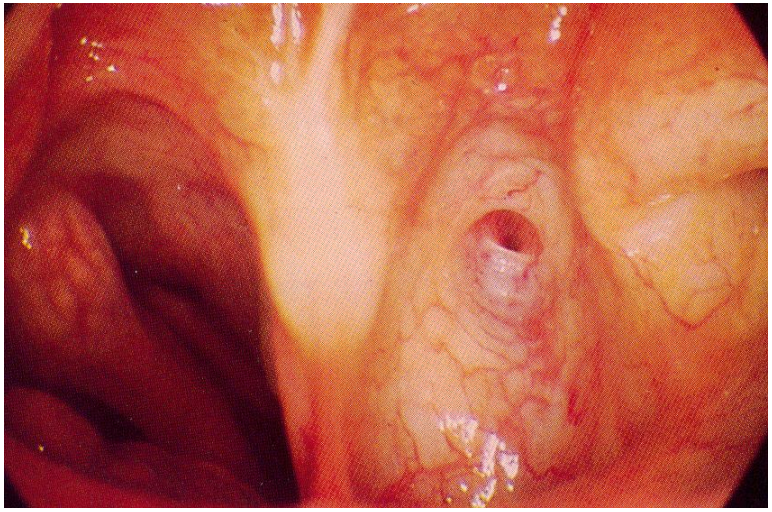
- Nose discharge during and after eating and beverages, especially hot and spized
- reflex cholinergic discharge evoked by irritation of sensoric receptors on palat, sometimes connected with lacrimation, reddnes and perspire.
- treatment - ipratropium bromid nosal spray 0.03% given 10 min before eating.

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Rinitis from non ventilating nose

After laryngectomy/tracheotomy

Rhinitis in choanal atresia



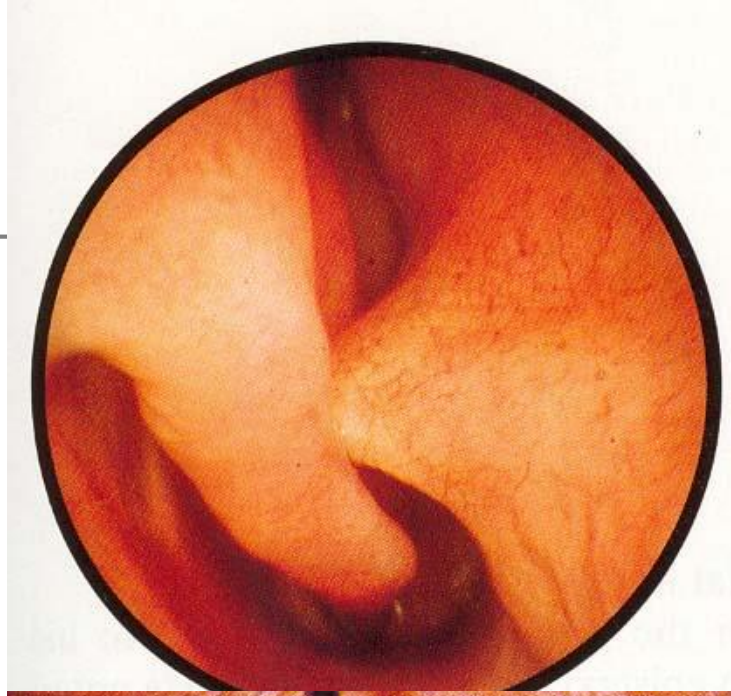
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Diagnosis

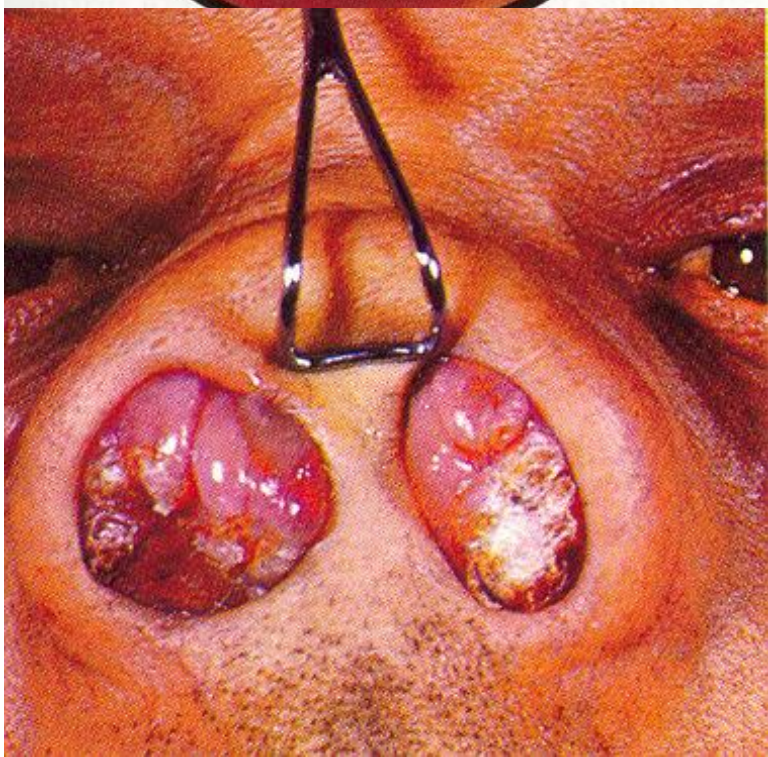
History	Rodinná, faktory zev. prostředí, chemikálie
ENT clinical investigation	Rinoskopie, endoskopie nosu, nosohltanu a paranazálních dutin
X-ray, ultrasound	Semiaxiální rtg, CT scany obličej. skeletu
Alergologic tests	Kožní testy, vyšetření celkových IgE, hodnoty a určení specifických IgE v séru
Cultivation	Bakteriologické vyšetření
Cytology	Vyšetření zánětlivé celulizace
Evaluation of mucociliar transport	Nazální mukociliární clearance (např. sacharinový test) nebo určení frekvence ciliárních kmitů, elektronová mikroskopie
Nose patency	Rinomanometrie
Evaluation of smell	Vyšetření čichového prahu

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Morphologic causes of nosal obstruction



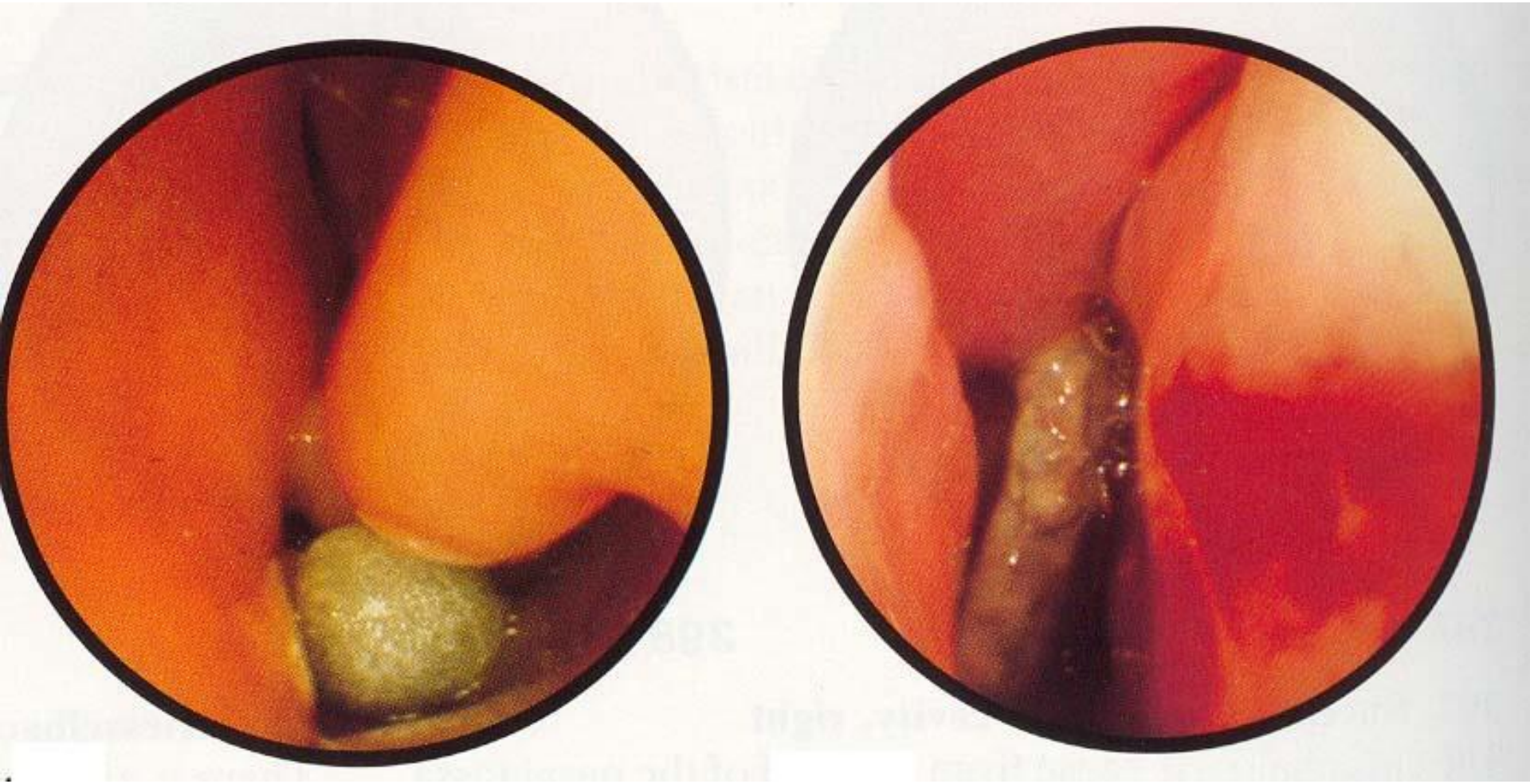
crista septi nasi



papilloma invertens

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

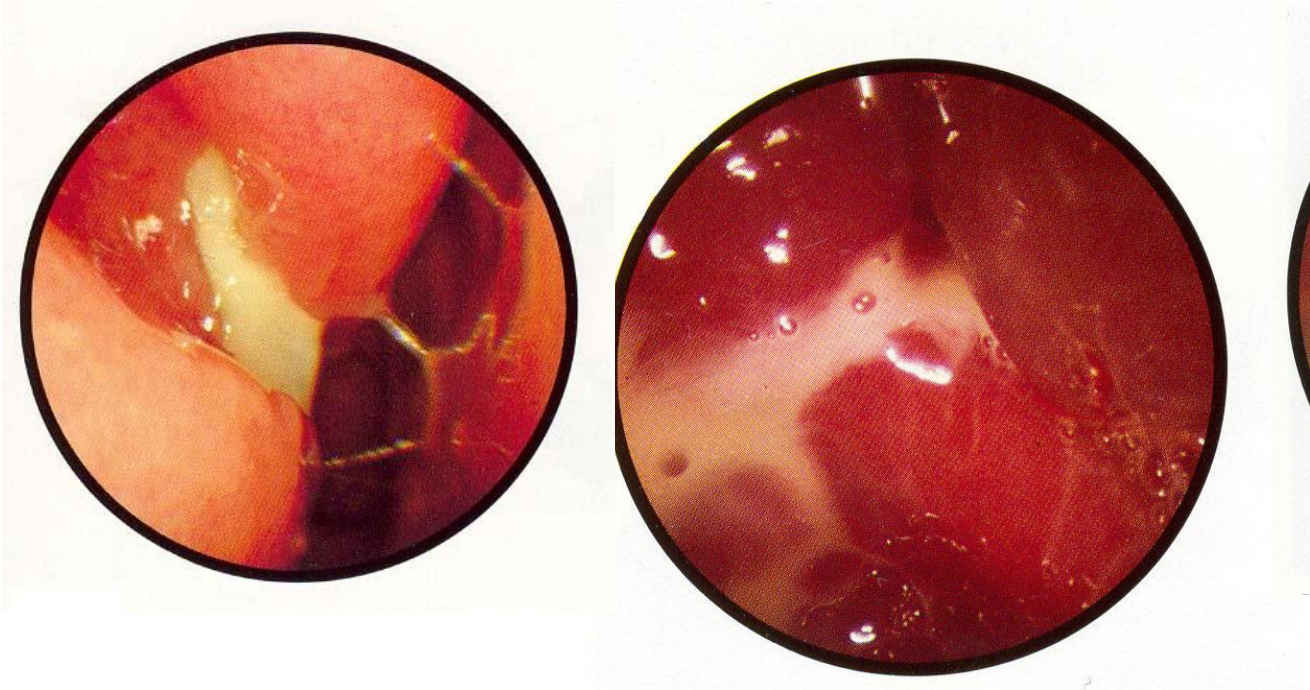
Intranasal foreign boddies



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Inflammations

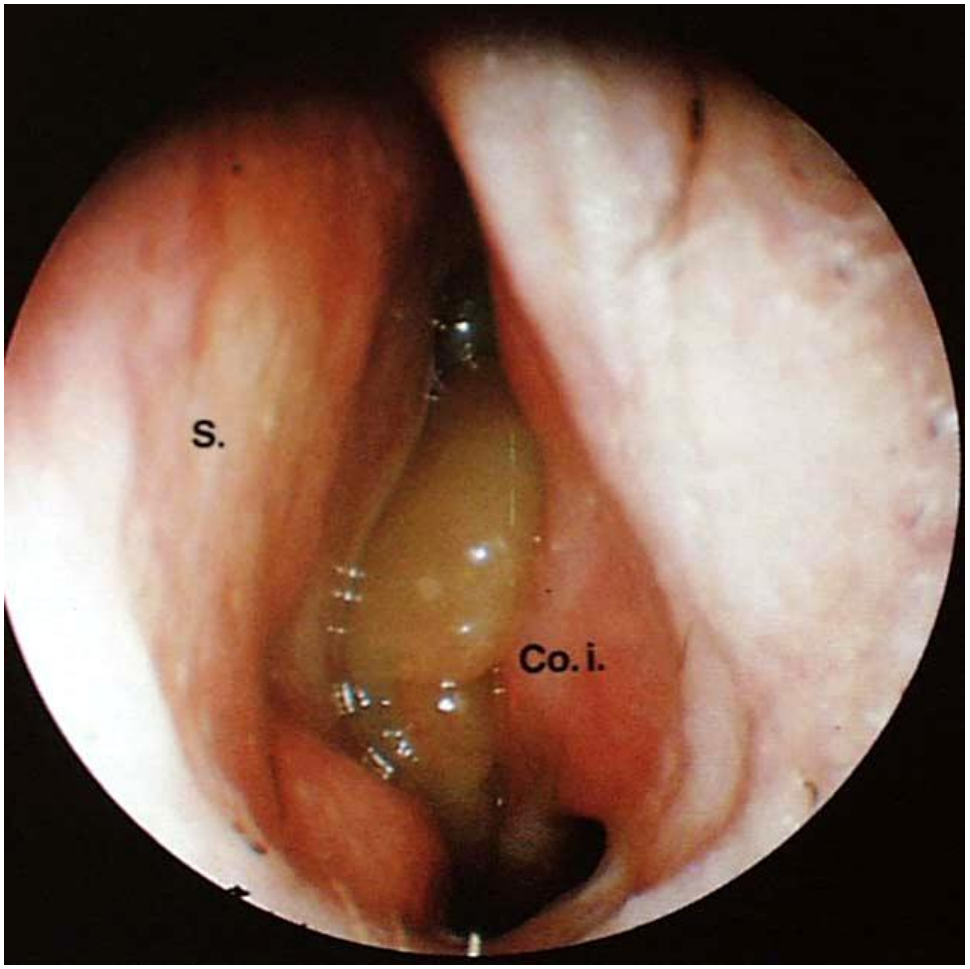
Acute rhinosinusitis



Mycotic sinusitis

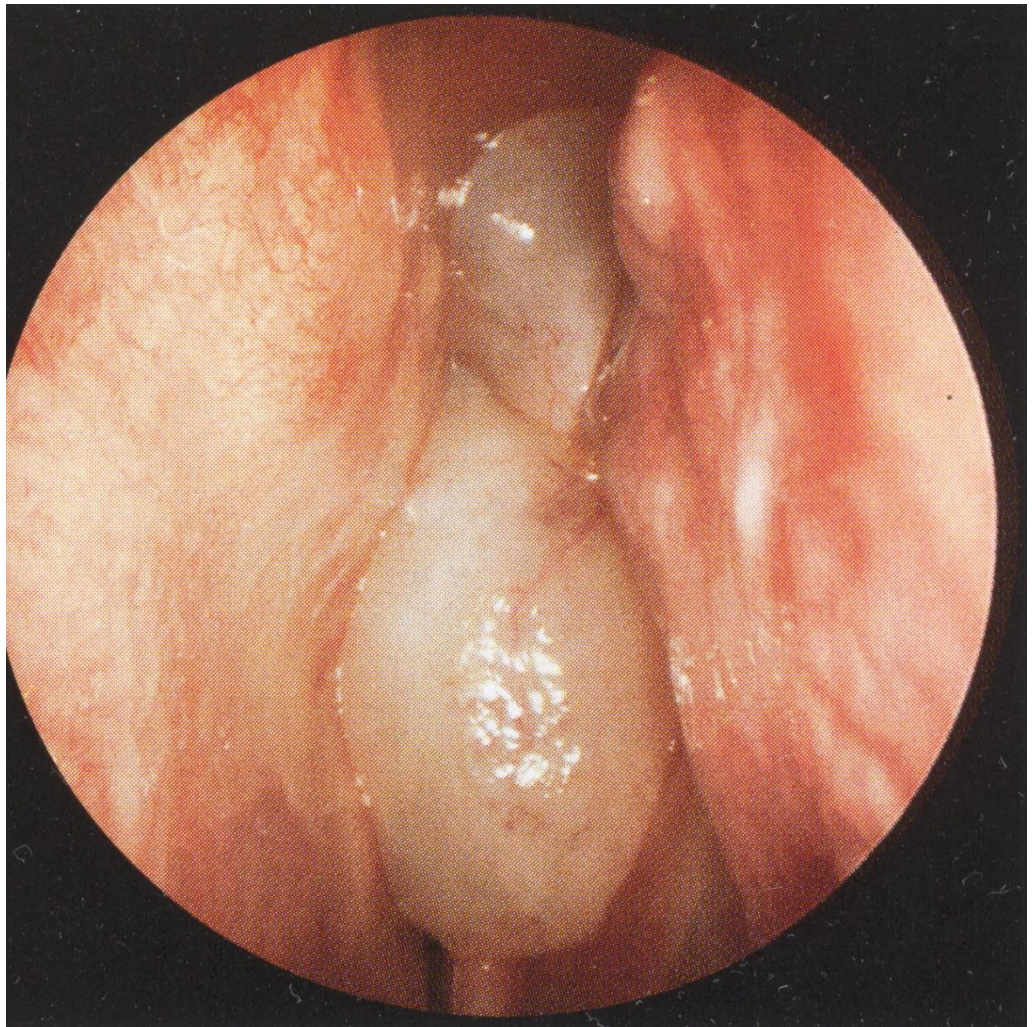
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

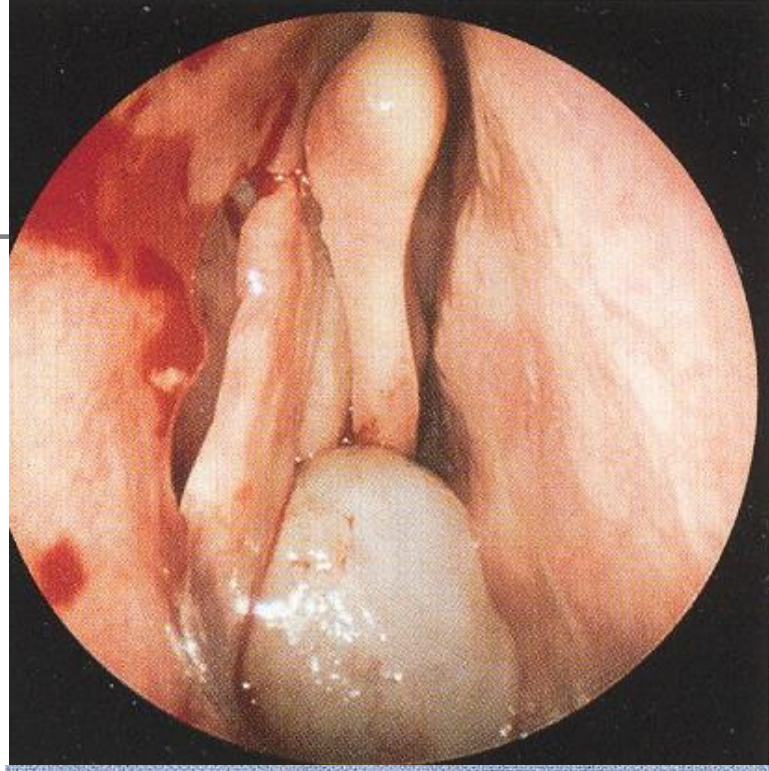
Nosal polyps



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Antrochoanal polyp





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Therapy of rhinitis

History
ENT evaluation
X-ray, CT
alergologic tests
cultivation, cytology
Nasal patency
Evaluation of olfactory sensation

Alergy
- intermittens
- persistence

→ Avoidance of alergen
antihistaminics
topical steroids

Inflammation
- acute
- chronic

→ antibiotics
Decongestivs
corticosteroids?

„Other"
- Nares,
- hormonal
- idiopathic
- Wegener´s granulomatosis
- tumor aj...

→ topical corticosteroids
local anticholinergics

Anatomical changes
(septum, skořepy…)

Alergology
Consider immunotherapy

Otolaryngology
surgery

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Therapy of chronic rhinosinusitis

- Medikamentous, conservative
- Surgery
  - „classical“ rhino-surgery
  - Functional endonasal sinus surgery (FESS)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

„Classical“ rhino-surgery

- Approach through healthy tissue
- All mucosa membrane is removed
- Mostly non-physiologic communication into the nose

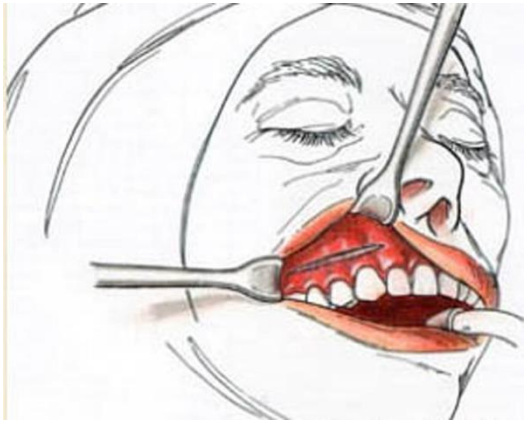
Maxillar sinus – sec. **Caldwell-Luc**

Ethmoidal labyrint – sec. **Moure**

Frontal sinus– sec. **Jansen-Ritter**

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

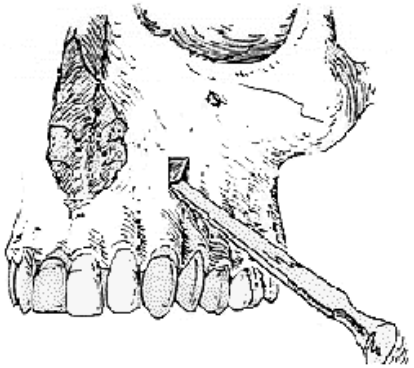
Caldwell-Luc

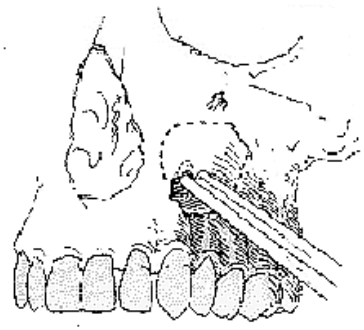


George Walter Caldwell
1866-1946

Henri Luc 1855-1925

1889
1893



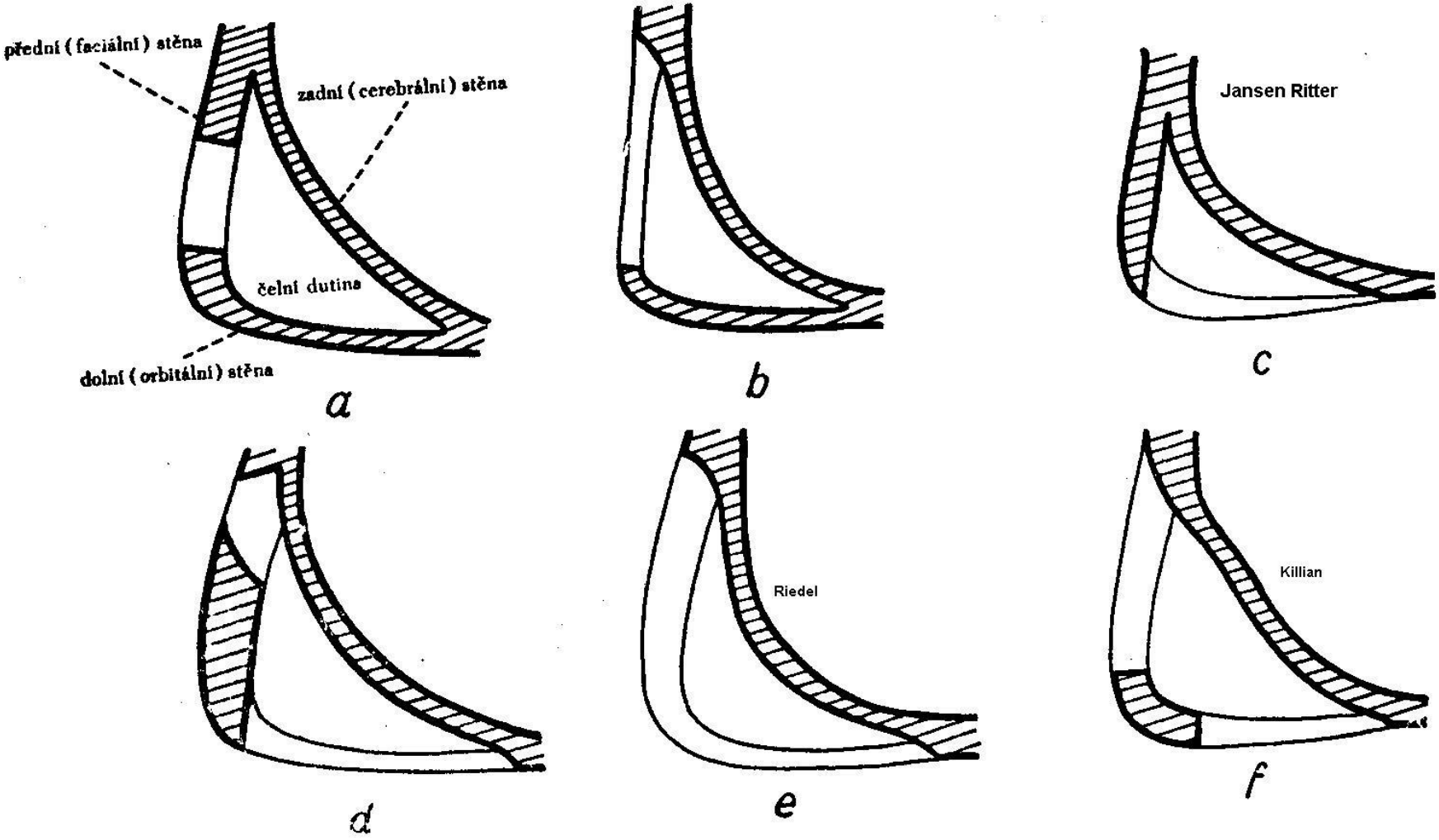


FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Classic rinosurgery

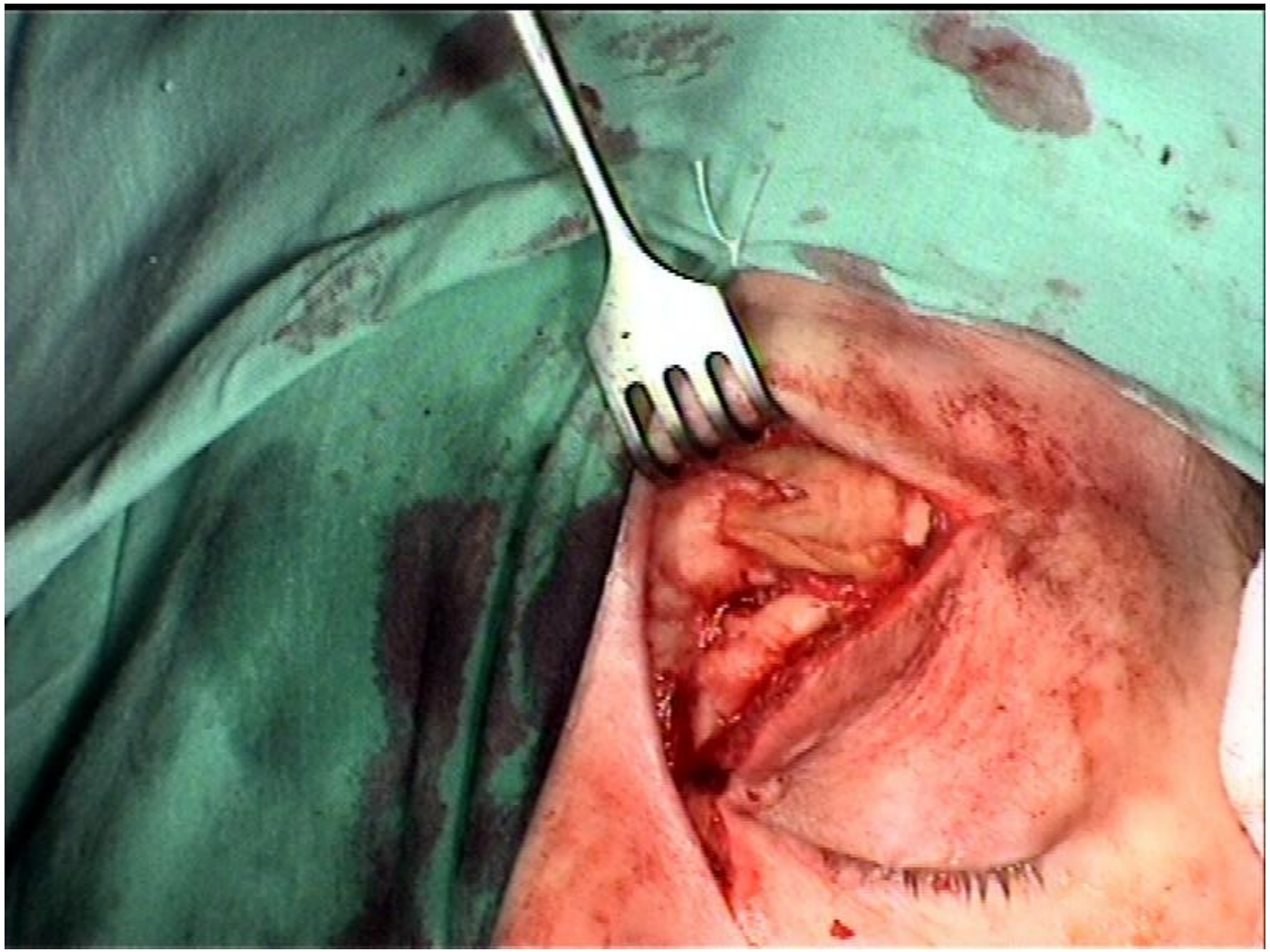
- Too high radicality
- many iatrogenn complicatoins (swelling, pain, inervation disorder)

Caldwell-Luc



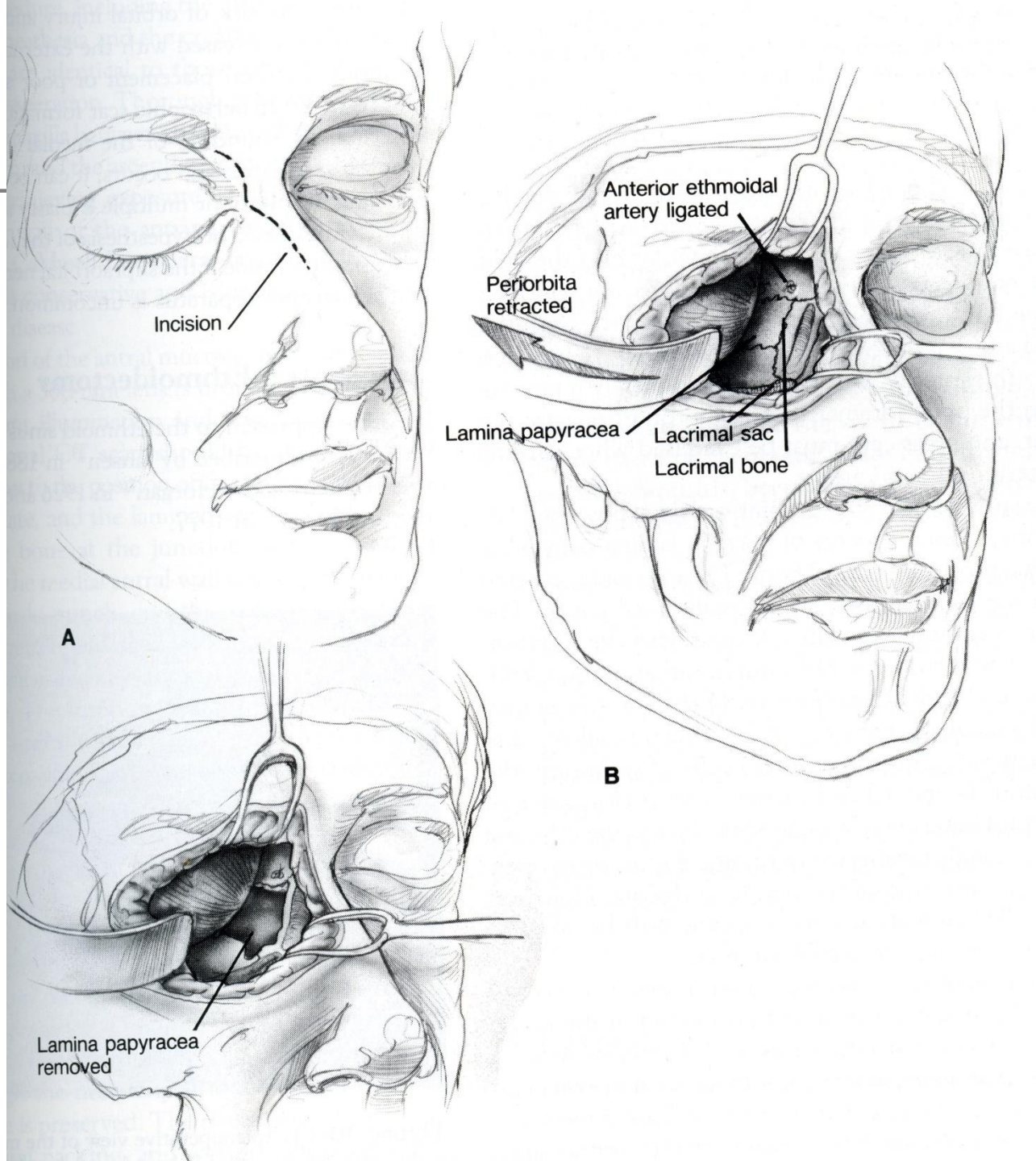
Různé typy operací čelních dutin (podle Denkera-Kahlera) II. str. 787

a) Ogston-Luc - b) Kuhnt - c) Jansen-Ritter při nízké čelní dutině
d) Jansen-Ritter při vysoké čelní dutině - e) Riedel - f) Killian



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

external ethmoid-ectomy



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

„classical“ rhino-surgery - indication

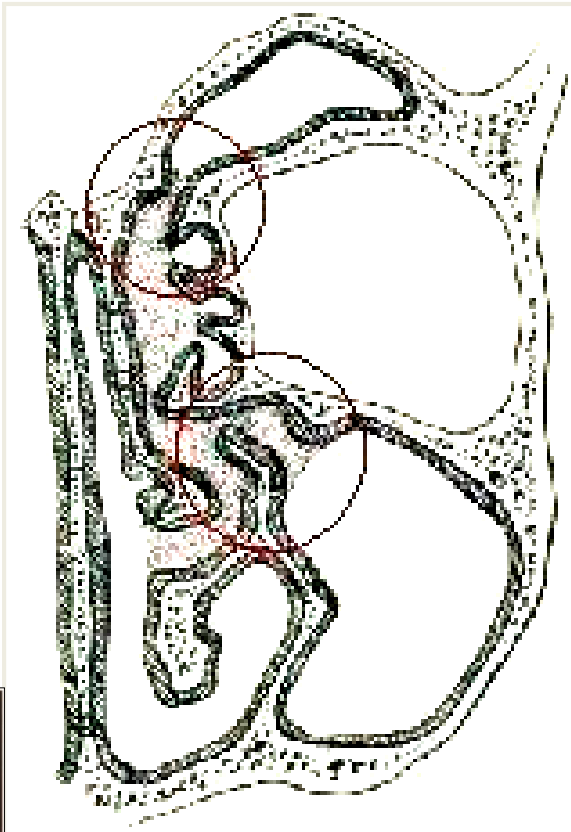
- Repeated FESS lege artis failed
- some atypical forms of sinusitis - mycotic sinusitis (aspergilom)
- Inflammatory complications of sinusitis
- tumory paranas. sinuses
- Some injuries
- Immunocopmpromised persons, congenital diseases

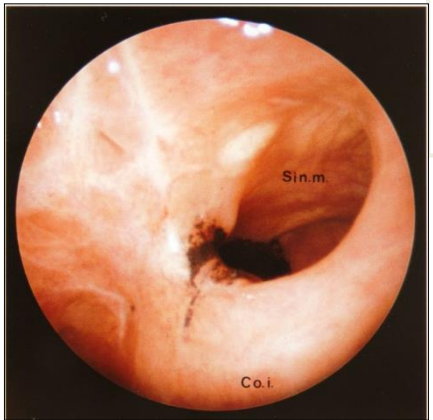
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Functional endonasal sinus surgery (FESS)

Basic considerations

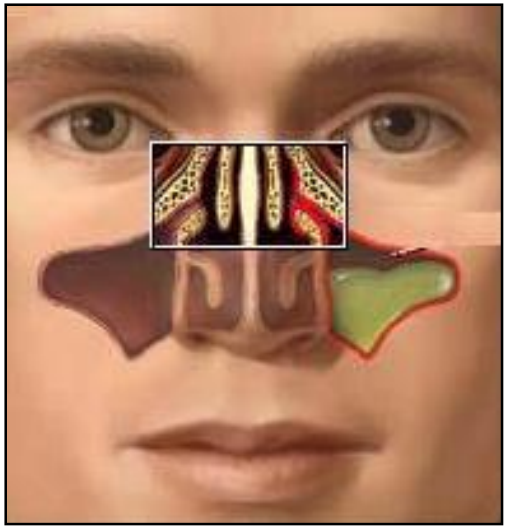
- Pathologically changed musose is able to restitution and should be preserved as more as possible
- For restitution it is necessary to create ventilation and drainage
- Epicentrum of rhinogenn sinusitis is in ehtmoidal labyrint





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Pathogenesis of chronic rhinosinusitis – „circulus vitiosus“



Blocked ostium

Impaired ventilation and drainage

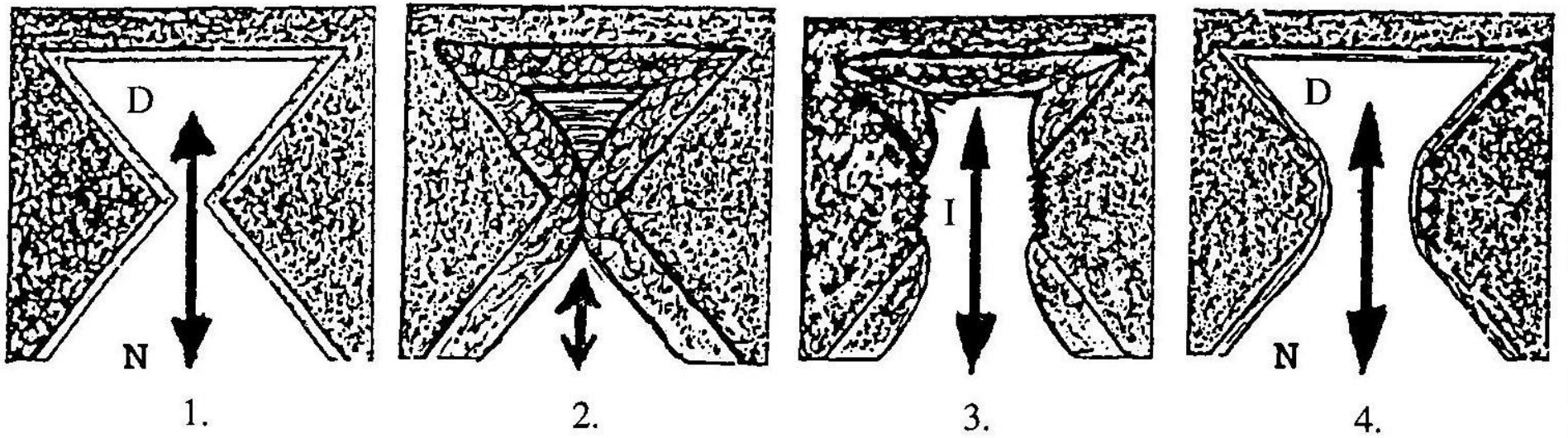
Stagnation of secretion

Disorder of gas exchange

Disorder of mukociliar transportation

FAKULTNÍ NEMOCNICE U SV. ANNY

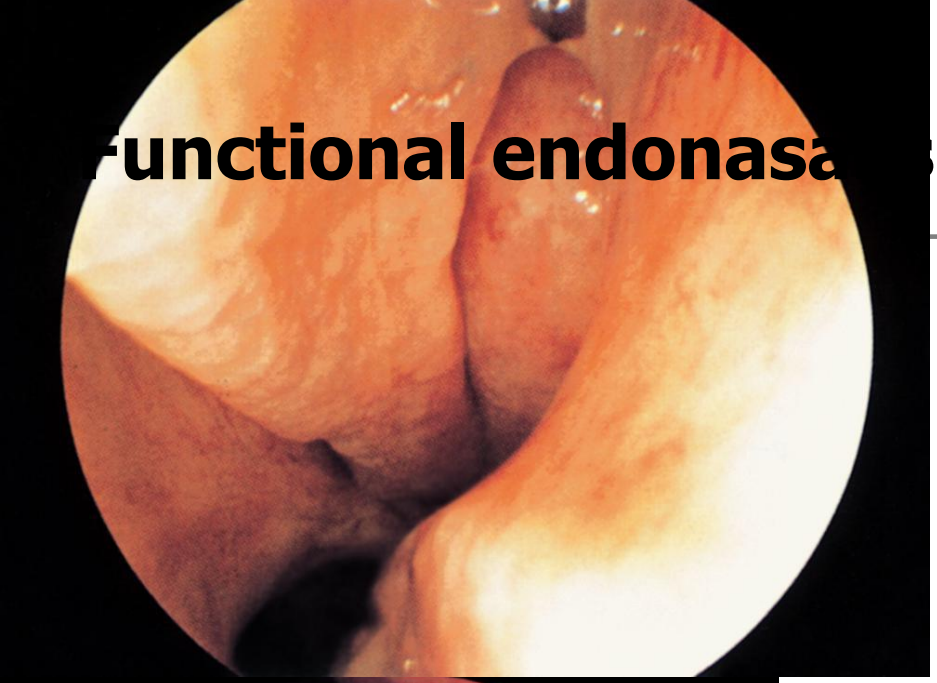
Isthmus surgery

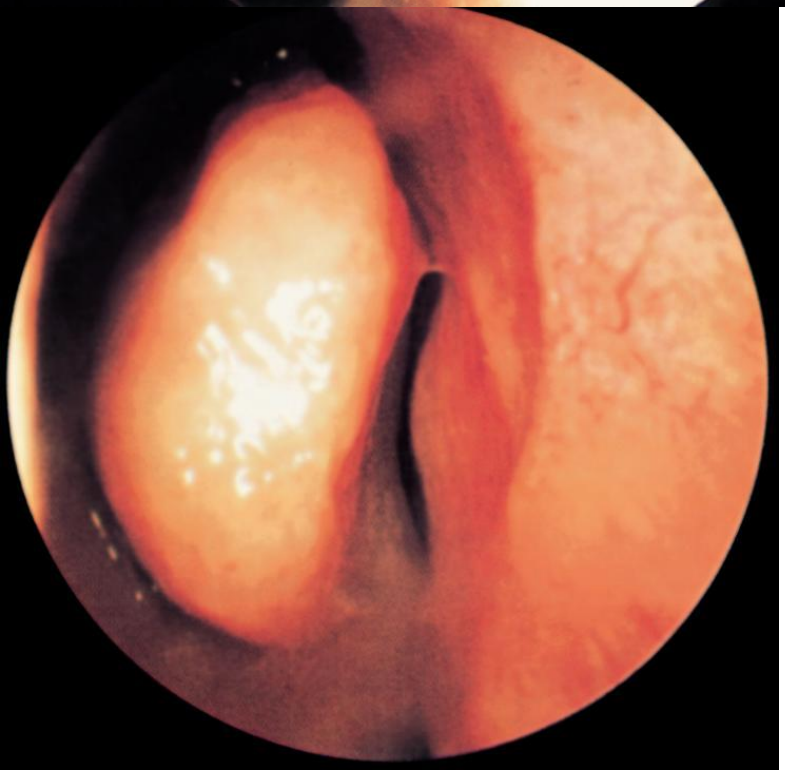


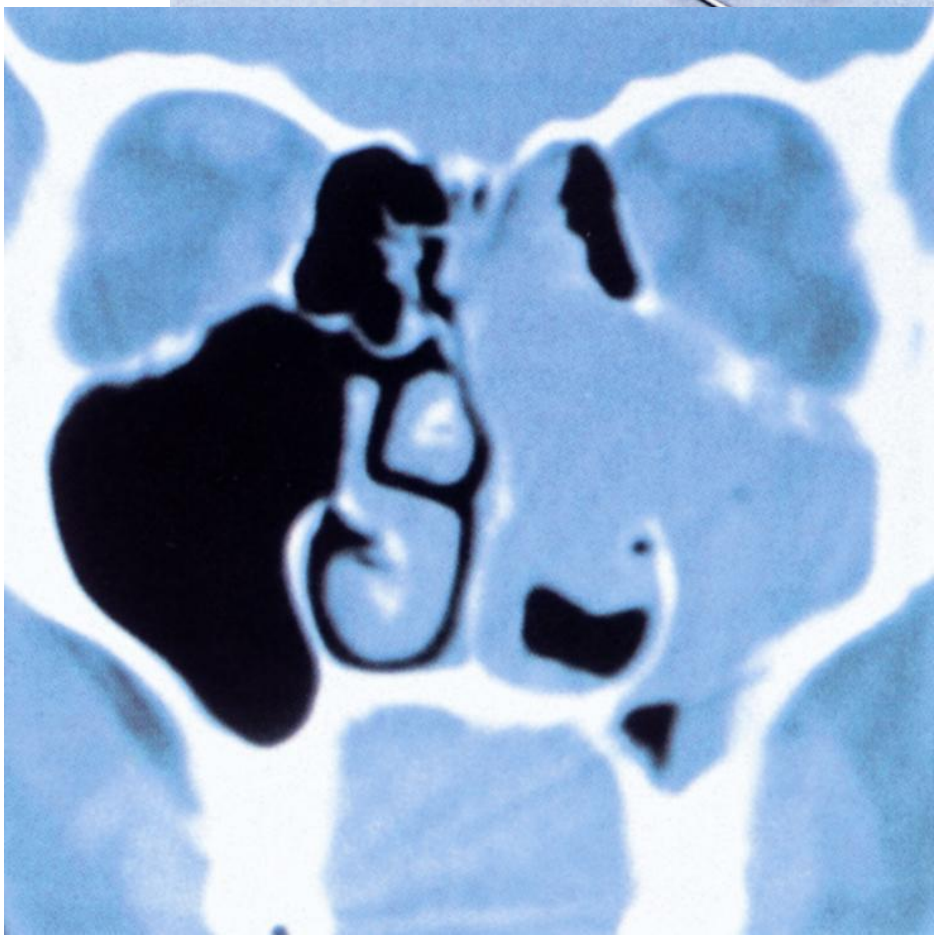
D paranas. sinus connected with nasal cavity N.

1. – normal situation
2. – closed ostium
3. – weidened ostium
4. – heald ostium with renewal communication D-N.

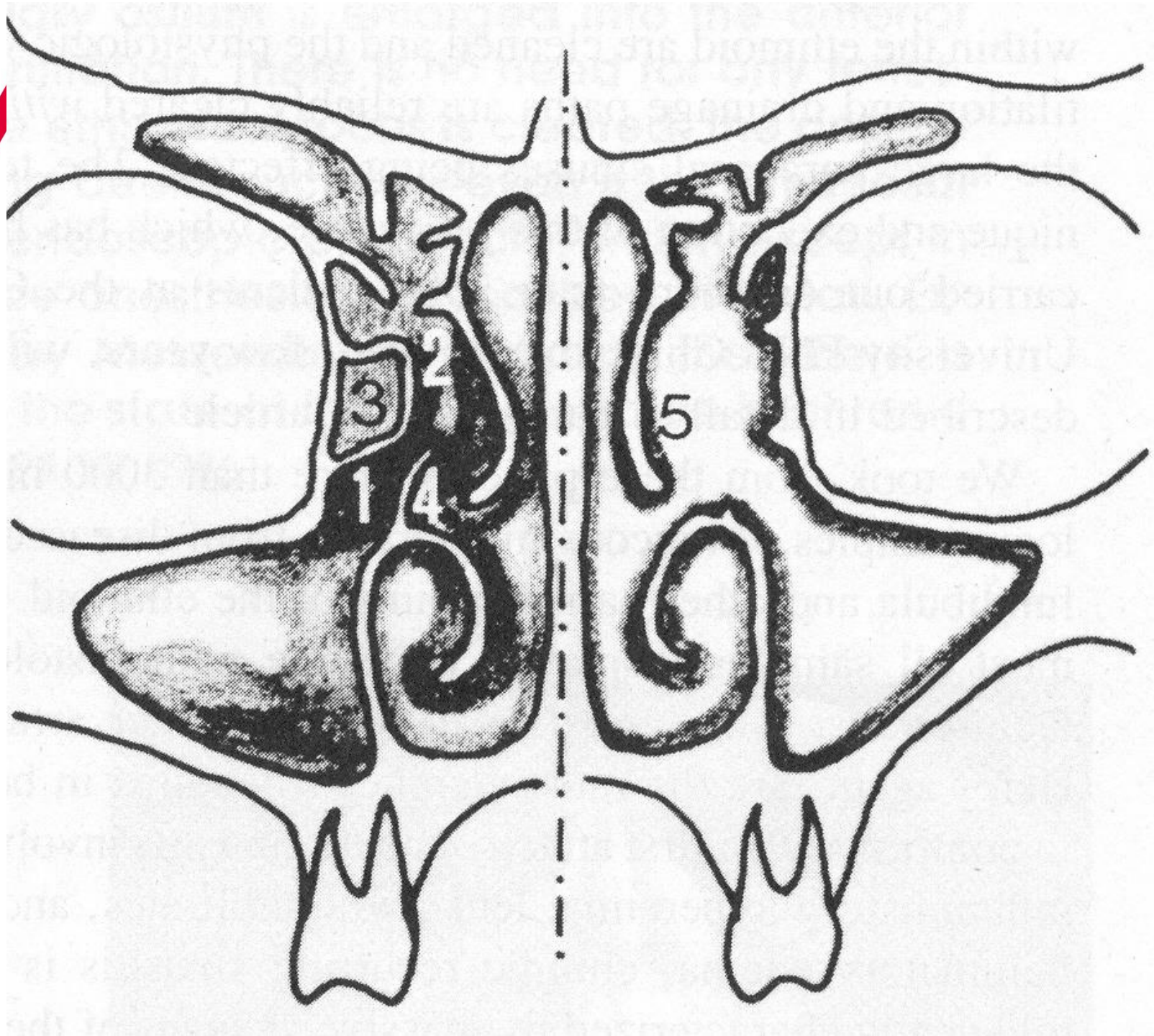
Functional endonasal sinus surgery (FESS)







FAKULTNÍ
NEMOCNICE
U SV. ANNY
V BRNĚ



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

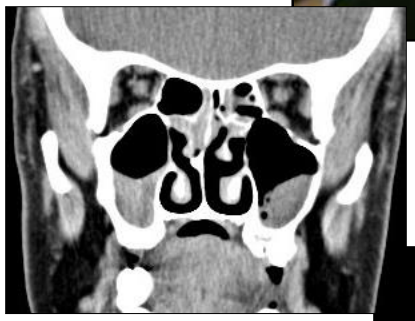
Indications, limits of FESS

- Only some surgeries are **treating the cause** – some chronic infectious inflamm., cysts and various structural changes disabling ventilation (deviatio of nasal septum, hyperpneumatised middle nasal concha et al.)
- Nasalization and enabling concervative treatment - **symptomatic** surgery as a part of **complex treatment**

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Indication of FESS

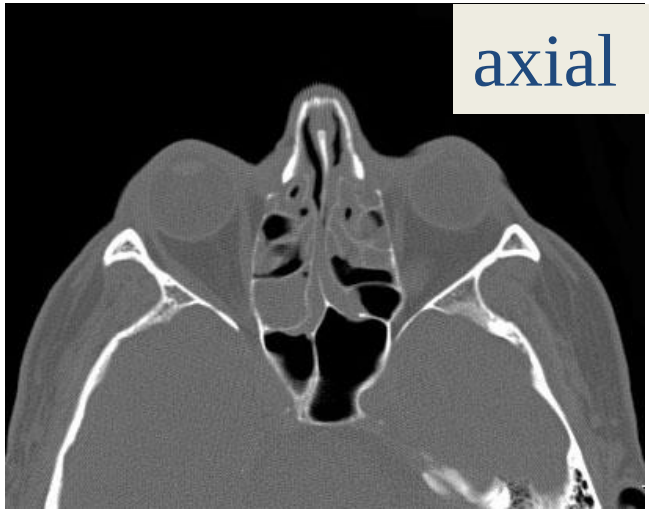
- History of disease
- Imaginating methods **(CT)**
- Rhinoendoskopy



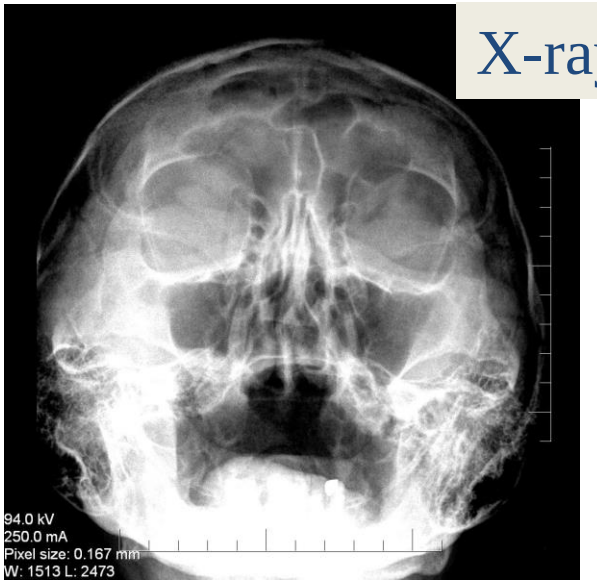
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

CT PND

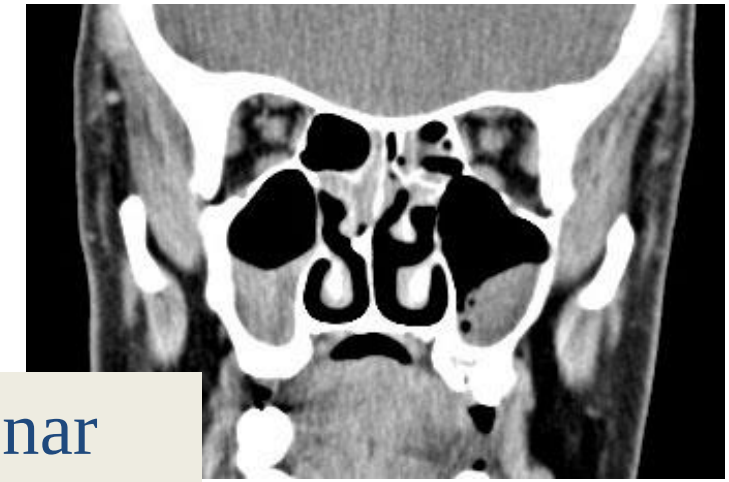
- Localisation and extent of pathological changes –type and extent of surgery
- Guidelines for surgeon – relationship to orbit and endokranium



axial



X-ray



coronar

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

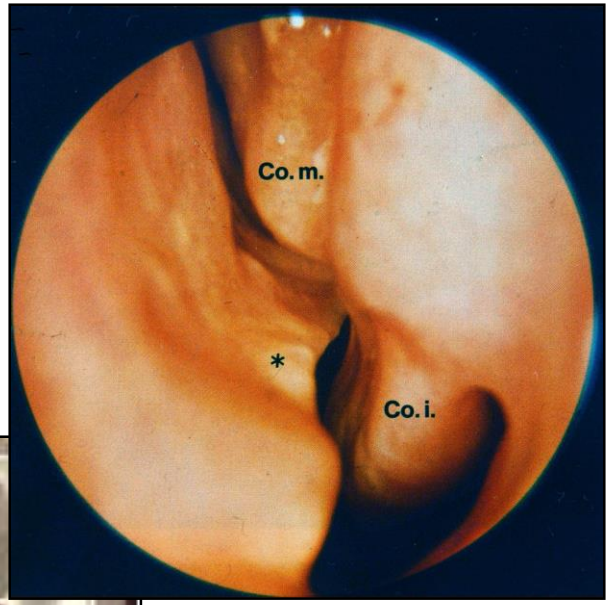
Surgery

- **Structural changes** in nasal cavity (deviace přepážky nosní, concha bullosa)
- **One sinus** (supraturbinal antrostomy, sphenoidotomy, frontal sinotomy, ethmoidektomy)
- **Pansinus surgery** („ Wigand complet“)

FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

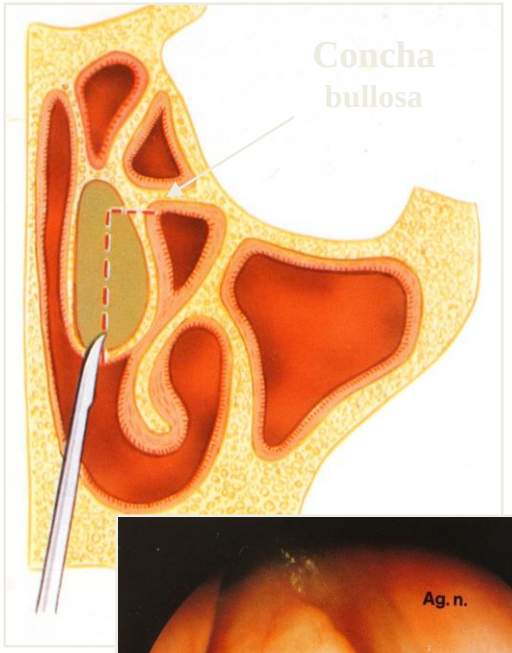
Surgery of nasal septum

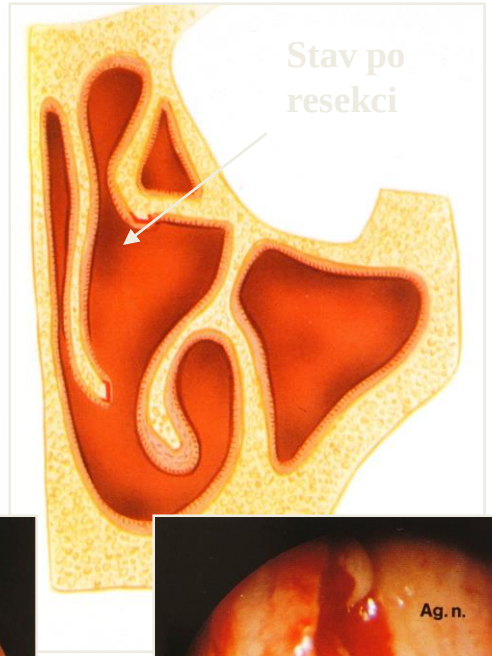
endoscopic resection (cristae, spins)



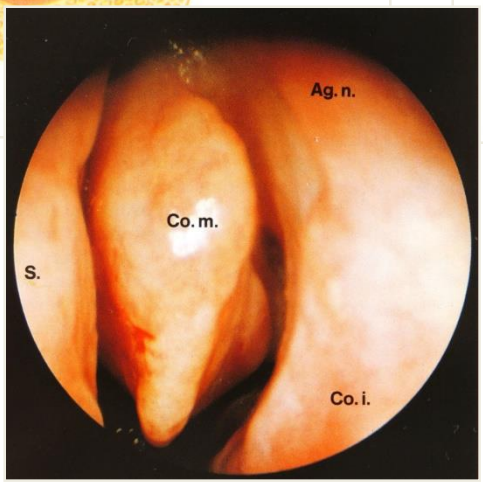
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

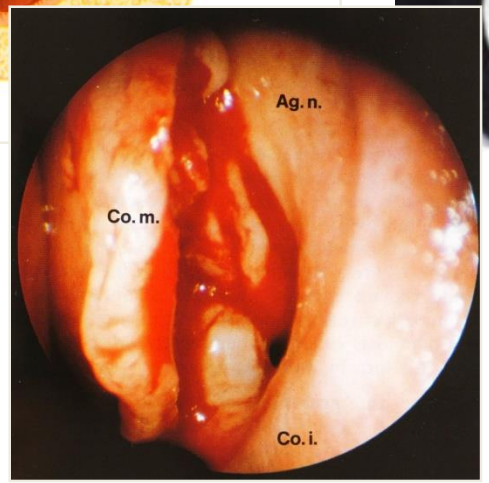
Concha bullosa resection





CT – c.b.

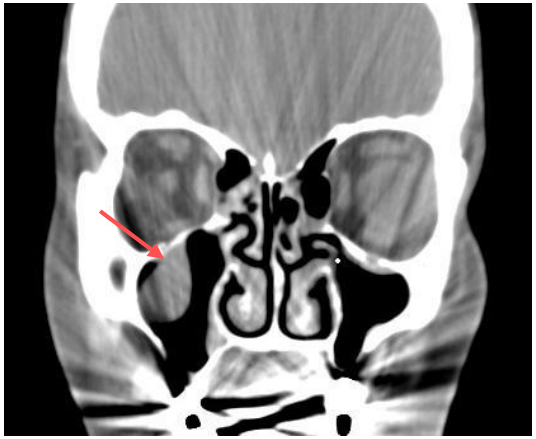


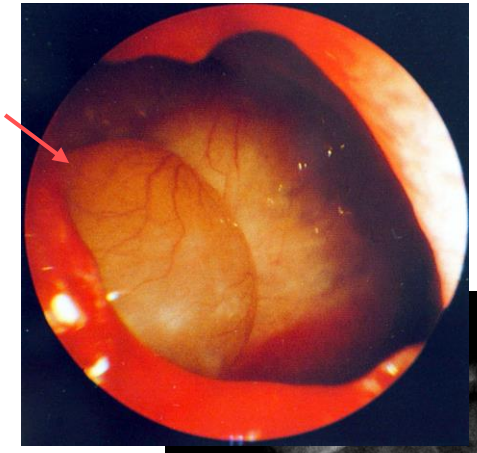


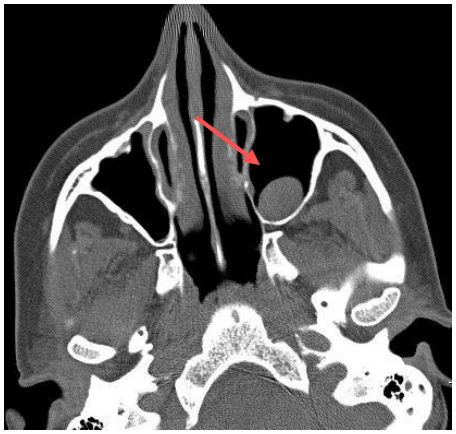
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

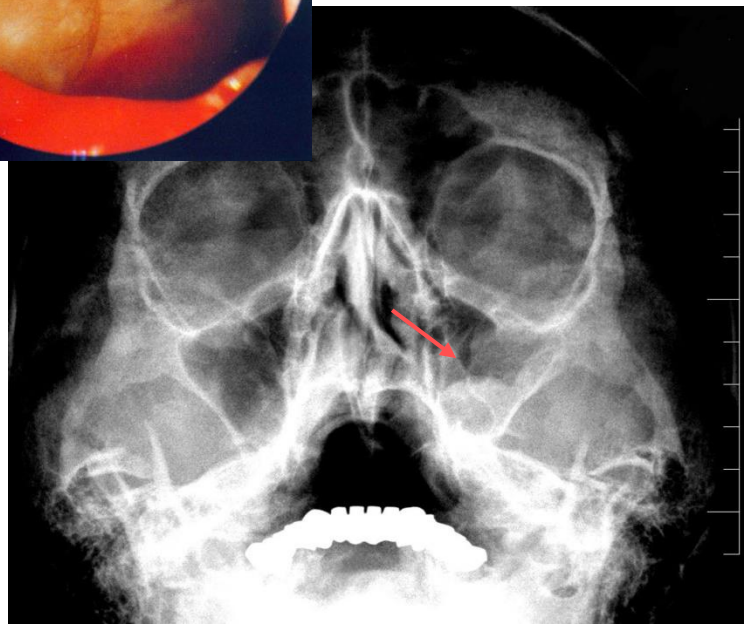
Maxillary sinoskopy

Mucosal cyst in antrum





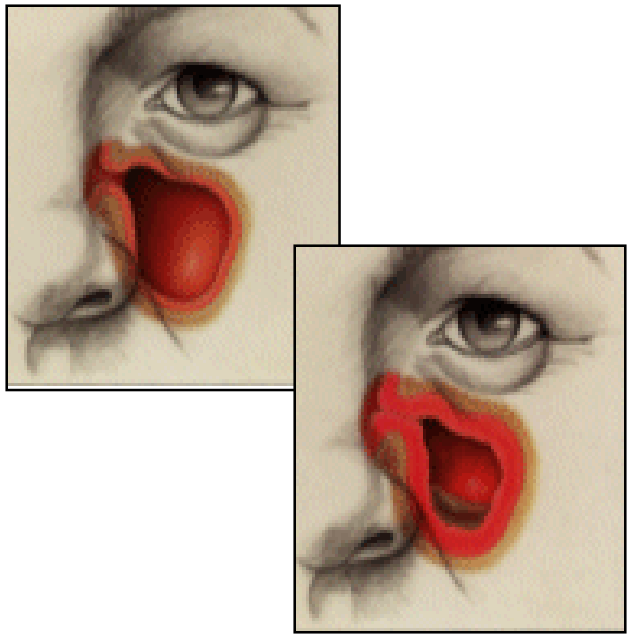


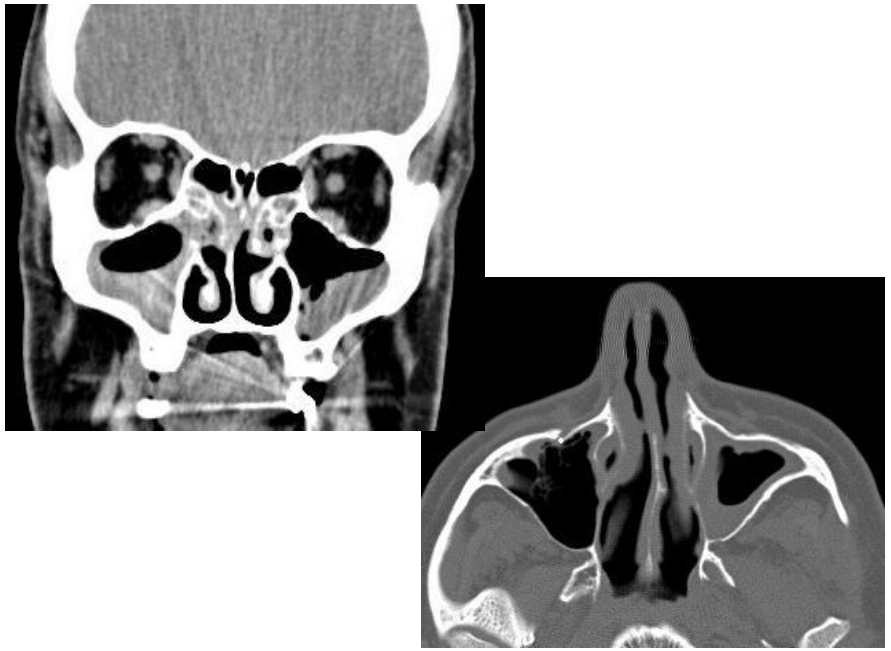


FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Supraturbinal antrostomy

Indication - chronic inflamm.chaneges of maxillary sinus caused by blocked ostio-meatal-unit

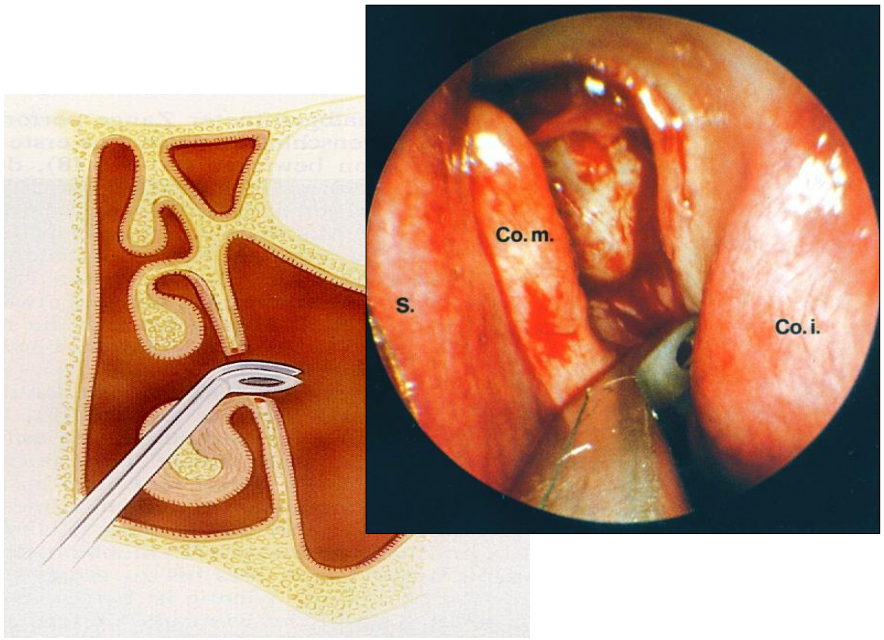


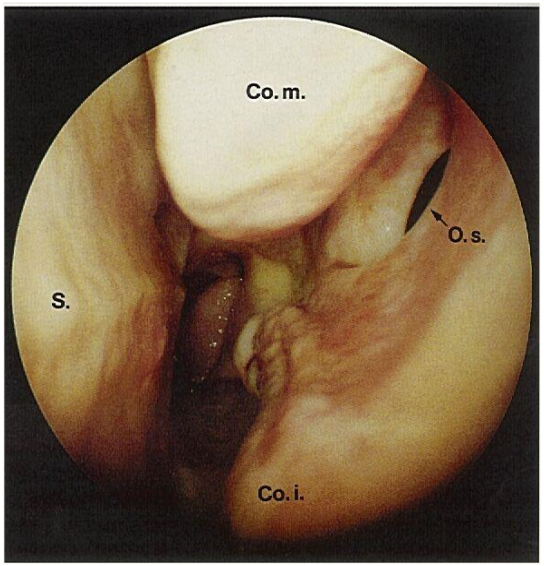


FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Supraturbinal antrostomy

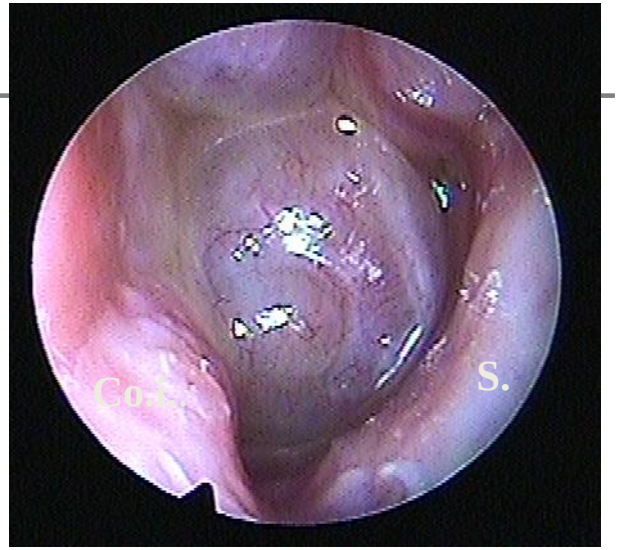
- renewal of communication between nose and maxillary sinus
- usually part of extent surgery





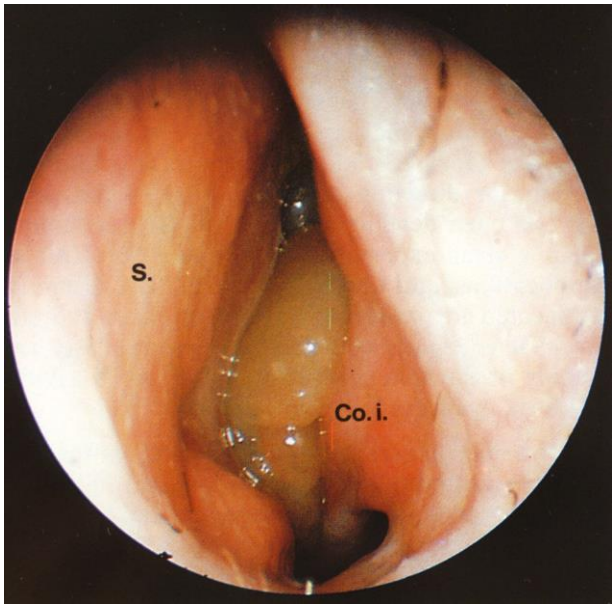
FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Pansinus surgery



Indication : chronic inflammations with polyposis

Aim : nasalisation of big paranas. sinuses



FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Pansinus surgery - CT

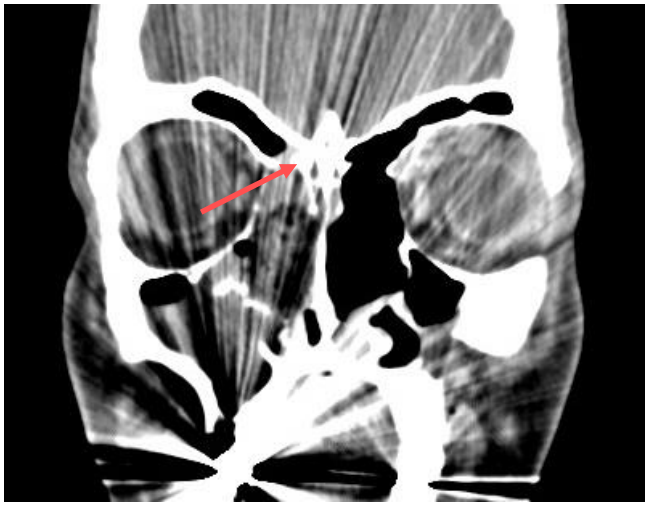





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Complications

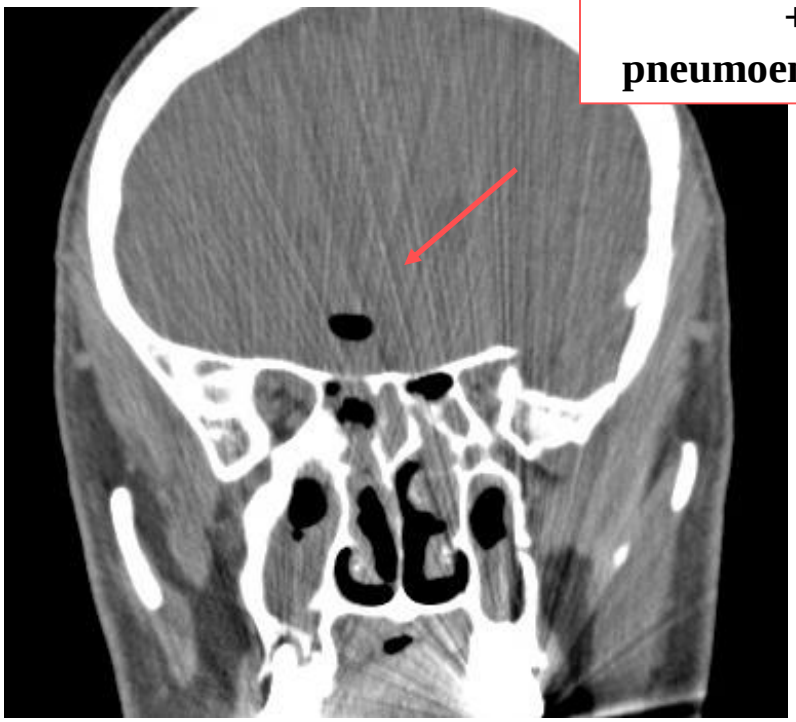
- **„Small“**
  - bleeding
  - hematoma,emphysema of eye lids
  - headache
- **„Big“**
  - retrobulb. hematoma
  - meningitis
  - liquorea
  - Bleeding from ACI
  - death

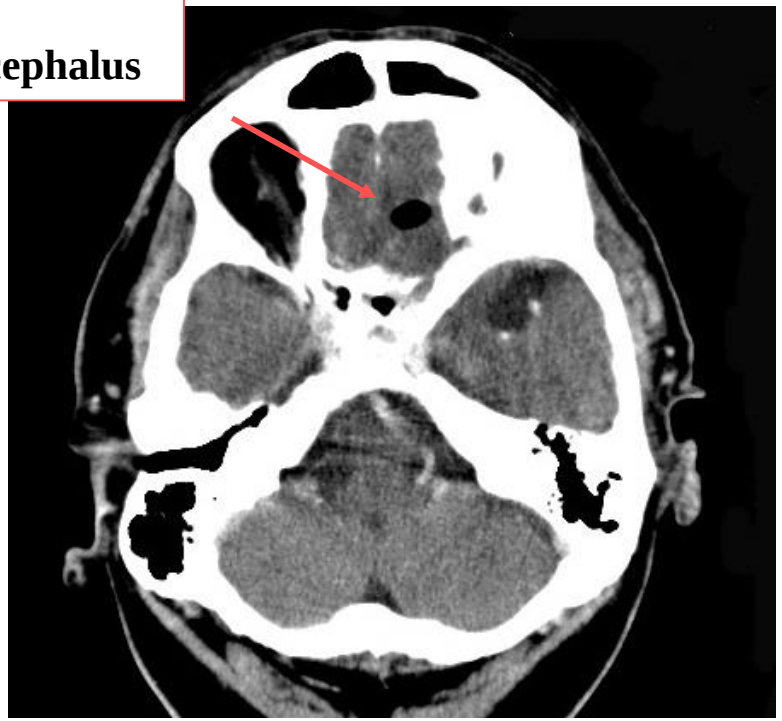


FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

Complications II

Liquorea
+
pneumoencephalus





FAKULTNÍ NEMOCNICE U SV. ANNY V BRNĚ

CAS – computer assisted surgery
Navigation system (Medtronic, Scopis – magnetic navigation)