



László Lujber

EAR, NOSE & THROAT

Seminar Book for Medical students in PTE

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University of Pécs Medical School
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Preface

Accurate diagnostic evaluation of the various diseases in otolaryngology--head and neck surgery needs special practical skills. Lujber's Ear, Nose & Throat seminar book describes in details and illustrates the standard ENT procedures, such as examining the ear, nose, throat, pharynx, oral cavity and the neck. It provides information on the related anatomy and possible pathologic findings. Illustrations, photos and videos pack each chapter to facilitate learning and recall. It is an essential practical guide and valuable tool for students studying medicine and preparing for the otolaryngology exam at Pécs University, Hungary, but also useful for trainees, residents, fellows and general practitioners. Besides, the book covers the procedures of artificial feeding, foreign body removal, myringotomy and the management of nosebleed. The practical videos are easily accessible and directly downloadable to the reader's mobile phone by using QR codes.

Key features:

The Ear, Nose & Throat seminar book contains 149 high-quality colour illustrations and clinical photographs, including ten lots of HD-quality, narrated videos.

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BASIC ENT EXAMINATION

1. Examination of the ear – Chapter I
2. Examination of the nose – Chapter II
3. Examination of the oral cavity – Chapter III
4. Examination of the larynx – Chapter IV
5. Examination of the nasopharynx – Chapter V
6. Examination of the neck – Chapter VI

ENT PATIENT EXAMINATION

ENT patient examination is complex and involves the assessment of the entire head and neck region, that of the nose, paranasal sinuses, ears, oral cavity, larynx, pharynx, cranial nerves and the neck. Special instruments, good illumination and flexible or rigid endoscopes are required to look into the narrow and hidden anatomical structures. A head-mirror with an external light source or a headlight (Fig 1.1), various handheld instruments and particular scopes are routinely used during a thorough otolaryngological examination (Fig 1.2. és Fig 1.3.).

The ideal location of the external light source is on the patient's right side above the level of the head of the sitting patient. The head mirror on the examiner's head should be adjusted in a way that the reflected light beam should illuminate the examined surface, while the examiner looks through the central hole of the head mirror. In this way, the axis of the light and the axis of the vision is the same, providing the best illumination of the visualized region. Some practice is needed to learn the correct use of the head mirror. The use of a headlight is

more straightforward, compared to the head mirror, but the light beam and the axis of vision are not precisely in the same line.



Fig 1.1. LED headlight.

A clean white coat for the doctor is appropriate dress for noninterventional examination when using necessary ENT handheld instruments. In the case of interventional procedures, doctors must wear protective gear suggested in guidelines.



Fig. 1.2. ENT instruments.

1. Aural metal specula
2. Angled metal tongue depressor
3. Nasal specula
4. Straight tongue depressor
5. Bunsen's light
6. A small mirror for the examination of the postnasal space
7. Laryngeal mirror
8. Gauze sheet
9. Wooden tongue depressor
10. Head-mirror

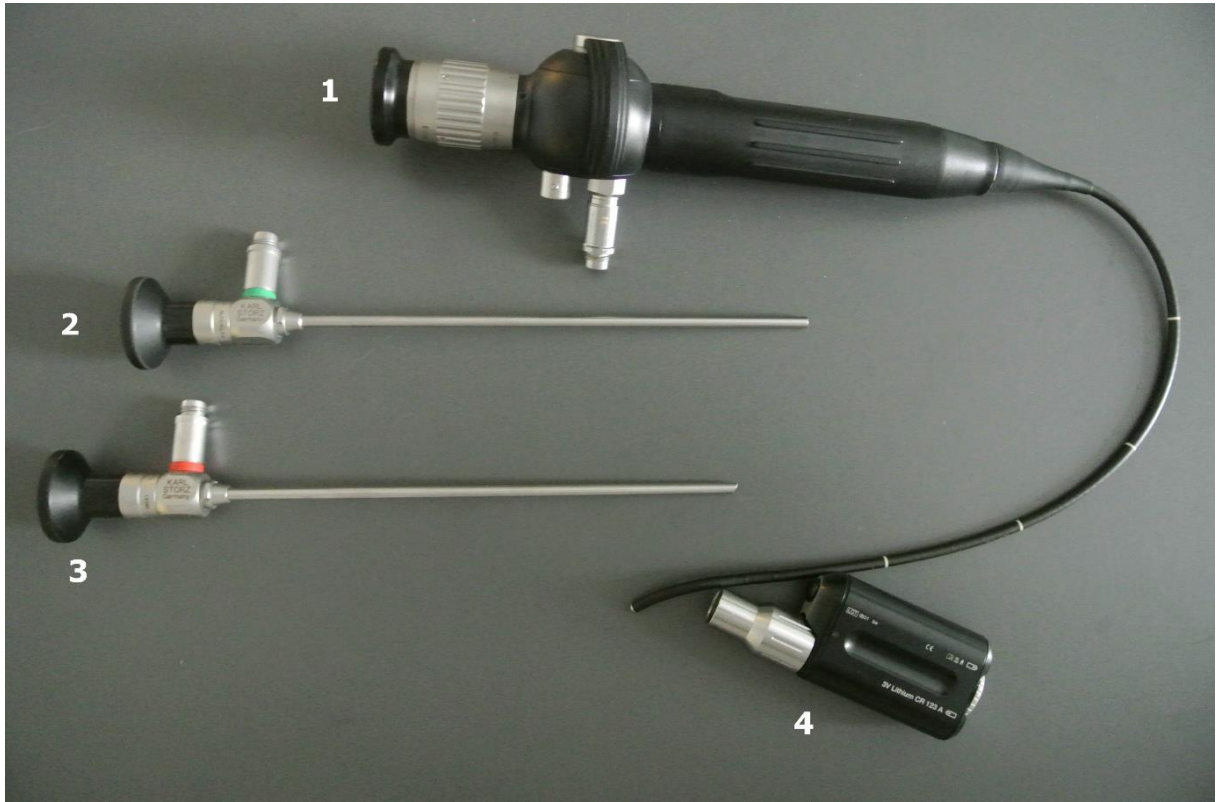


Fig 1.3.

1. Flexible fiberscope
2. 0° degree Hopkins rod
3. 30° degree rigid scope
4. Light source

During a routine ear examination the auricle (pinna), the external auditory canal and the tympanic membrane are examined, besides we can gain some indirect information about the medical condition of the middle ear.

Inspection.

Both the anterior and posterior surface of the pinna is to be inspected. Normal and pathological conditions are illustrated later.

Next, the outer portion of the external ear canal should be inspected. The meatus is S-shaped; therefore, the pinna is retracted backwards and outwards to straighten the ear canal. The index finger may be used to hold the tragus forward to visualize the ear canal and the drum better. In children, the pinna is pulled backwards and downwards (Fig 1.4.).

What to inspect:

- Anterior surface of the pinna.
- Posterior surface of the pinna.
- Entrance of the ear canal.

(Note any dermal hyperaemia, oedema, masses, malformations, signs of infection, scars, ulcers etc....)

Palpation

Tenderness

Pinna or tragus is painful when touching or pulling the ear:

- Sign for external otitis in adults.
- Sign for external ear infection in children, but might also signal middle ear infection, as children's ear canal is short and ear cartilages are soft; thus external pressure transmits easily into middle ear cavity to trigger pain.

Pain over the mastoid process:

- Signals a possible mastoiditis.

Change of tissue consistency

- Stiff, rigid, e.g. keloid, "cauliflower ear".
- Soft, e.g. haematoma, atheroma.



Fig. 1.4. Pinna is retracted backwards and upwards, while tragus is pulled anteriorly to examine the ear canal.

Palpable lymph nodes

Preauricular-, retro auricular-, subauricular lymph nodes (mastoid region, parotid region) (see details in Chapter VI.).

Examination with an ear funnel

Instruments to be used:

- Head-mirror or head-light + ear funnel
- Microscope+ ear funnel
- Ear endoscope

The ear funnel should be placed to the entrance of the ear canal while retracting the pinna posterosuperior (Fig. 1.5.). The medial part of the ear canal, the tympanic membrane and indirectly the middle ear can be examined.



Fig. 1.5. The examination of the ear with ear funnel.

Note in the ear canal:

<i>Colour:</i>	Hyperaemic	→	Sign of inflammation. An infected external ear canal is red, swollen, discharging and painfully occludes.
<i>Diameter::</i>	Narrow	→	Circumferential.
	Narrow	→	Local (e.g. local osteoma, exostosis frequent in swimmers).
	Occluded	→	Congenital malformations, iatrogenic (e.g. surgery).
<i>Patency:</i>	Irregular	→	“Step-like” bony deformity (fracture).
<i>Content:</i>	Blocked	→	Cerumen-ear wax, mucopurulent discharge (otorrhoea), malignant growth, foreign body etc.

Next, examine the tympanic membrane. Note the normal or altered anatomy of the drum (see details in "Ear Anatomy" section below).

Next, the patient is asked to equalize during the examination to check the patency of the Eustachian tube by visualizing the movement of the drum.

Valsalva manoeuvre:

"Blowing the head up" while blocking the nose and closing the mouth.

Toynbee test:

Swallow while blocking the nose and closing the mouth.

Usually, the drum moves during the manoeuvres. Reduced mobility is conspicuous and is evidence of middle ear fluid.

A pneumatic otoscope can examine the mobility of the drum. A handheld air-filled bulb attached to the otoscope enables air to inflate against the tympanic membrane to demonstrate its mobility.

Fistula sign: Creating a pressure change in the ear canal by pushing on the tragus will cause dizziness in those with the erosion of the labyrinth, e.g. cholesteatoma, perilymph fistula.

Do the ear examination on both sides!

Ear Anatomy

Parts of the ear: External ear, middle ear, inner ear

External ear (auricle /pinna/ + external auditory canal)

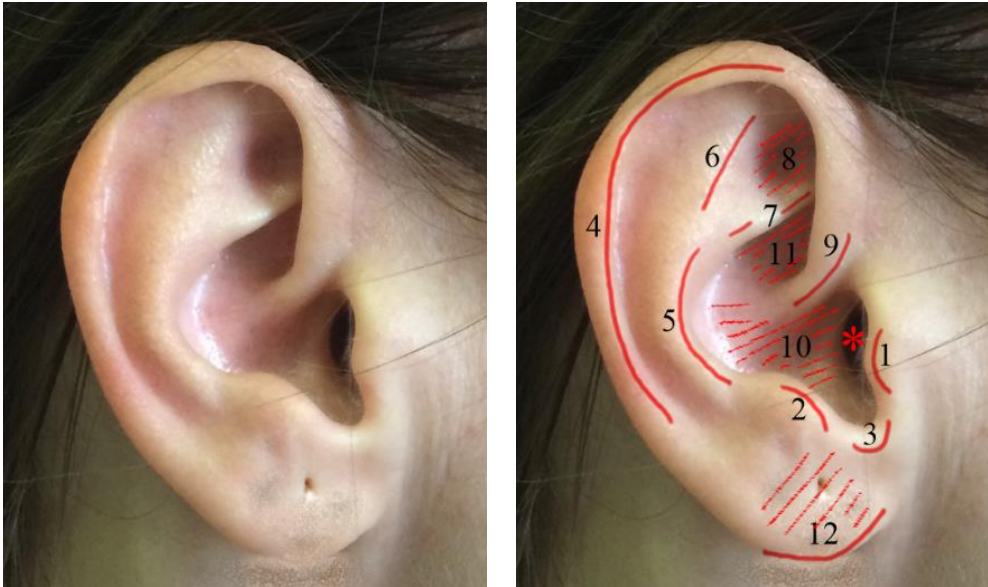


Fig. 1.6. Anatomy of the pinna

1. Tragus
2. Antitragus
3. Incisura intertragica
4. Helix
5. Anthelix
6. Crus superior anthelicis
7. Crus inferior anthelicis
8. Fossa triangularis
9. Crus helices
10. Cavum conchae
11. Cymba conchae
12. Lobulus

*Lateral orifice of the external ear canal.

External auditory canal

The external auditory canal is approximately 25 mm long, the lateral 2/3 is cartilaginous, and the medial 1/3 is bony. The lateral skin lining is thick containing hair follicles, glands producing wax and sweat, whereas medially the skin is very thin and fragile (Fig.1.7).

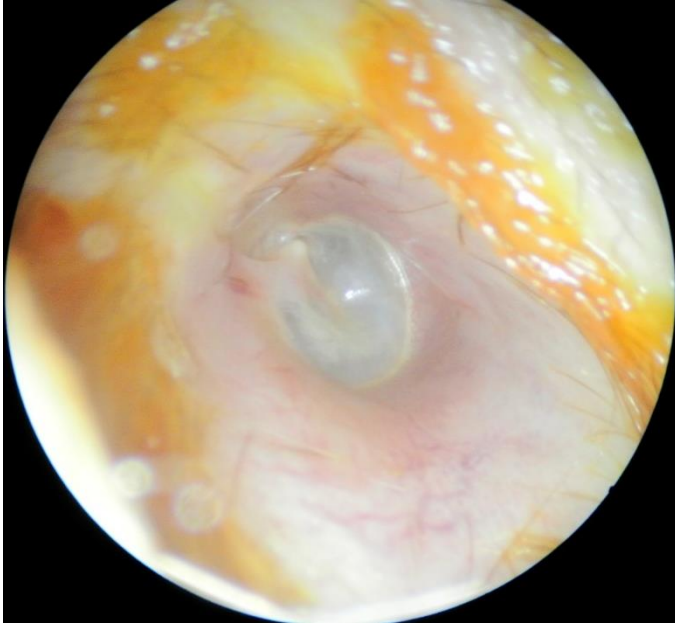


Fig.1.7. Right ear canal with some wax laterally. Tympanic membrane and the delicate skin of the ear canal visible medially.

Tympanic membrane

The normal tympanic membrane is grey, and its vascularity varies, but usually, only longitudinal blood vessels are visible along with the handle of the malleus (Fig. 1.8.). The inferior margo of the drum is medial compared to the superior margo. It is termed as "inclination" (superoinferior axis) (Fig.1.9.). On the other hand, the posterior edge of the drum is located laterally compared to the anterior border. It is named as "declination" (anteroposterior axis) (Fig.1.10.).

The surface of the eardrum is divided into two main parts. Pars flaccida of the tympanic membrane is superior to the short process of the malleus. Umbo is in the centre of pars tensa. Pars tensa is divided into four quadrants (Fig.1.11.).

Pars flaccida / Shrapnel's membrane/

(2 layers: inner mucosa + outer skin)

Pars tensa (divided into four quadrants)

(Pars tensa has three layers: inner mucosa + circumferential and longitudinal elastic fibres + outer skin)

Quadrants:

1. anterior-superior quadrant (AS)
2. anterior-inferior quadrant (AI)
3. posterior-superior quadrant (PS)
4. inferior-superior quadrant (PI)

The light is reflexing when illuminating the surface of the drum. The light reflex is typically located on the border of the anterior quadrants.

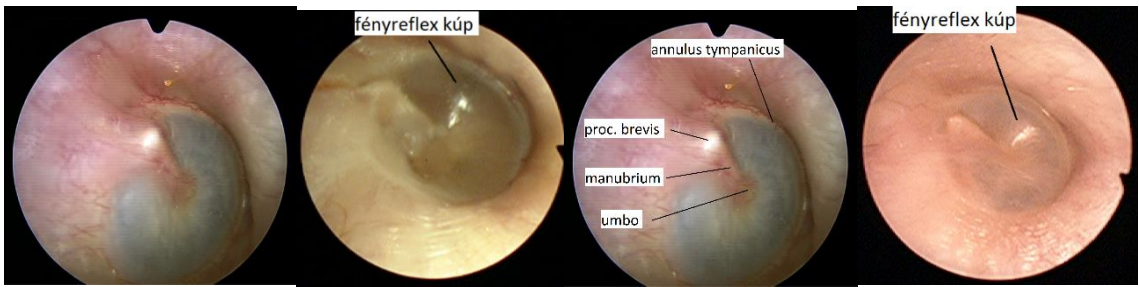


Fig. 1.8. Landmarks of the right-sided tympanic membrane.

The prominent landmarks of the drum:

- Light reflex
- Short /lateral process of the malleus
- Handle of the malleus
- Umbo
- Annulus of the tympanic membrane

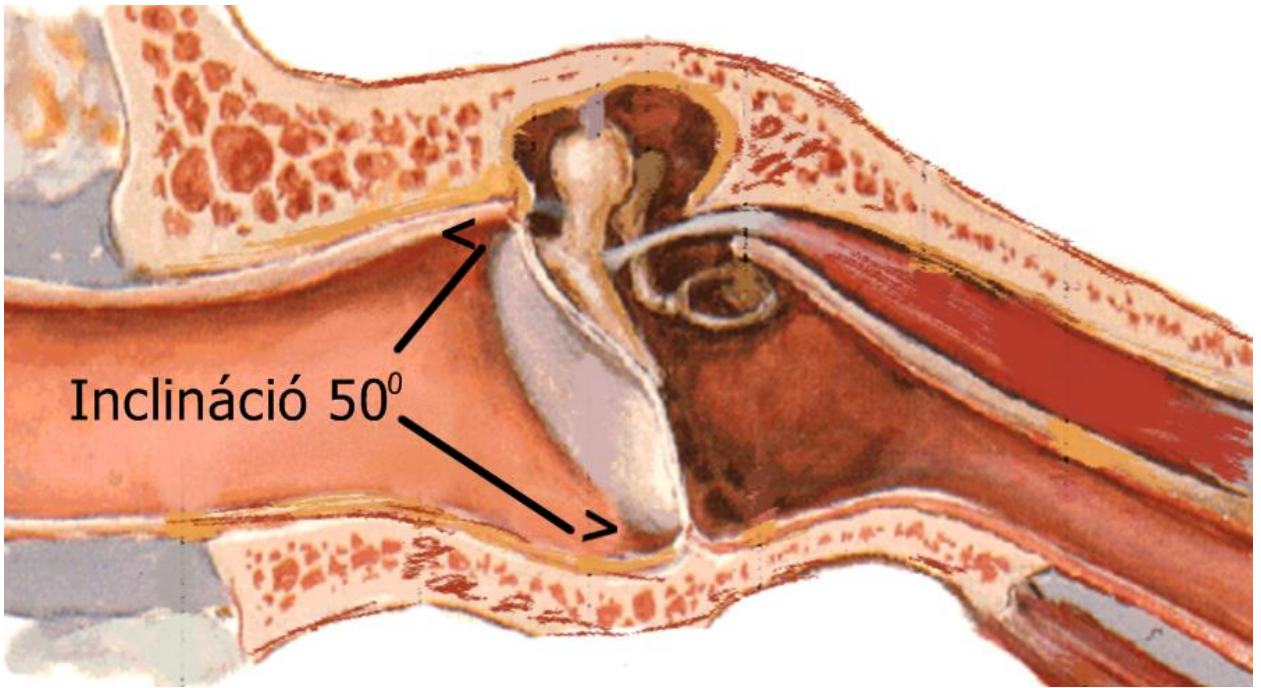


Fig. 1.9. Tympanic membrane inclination.

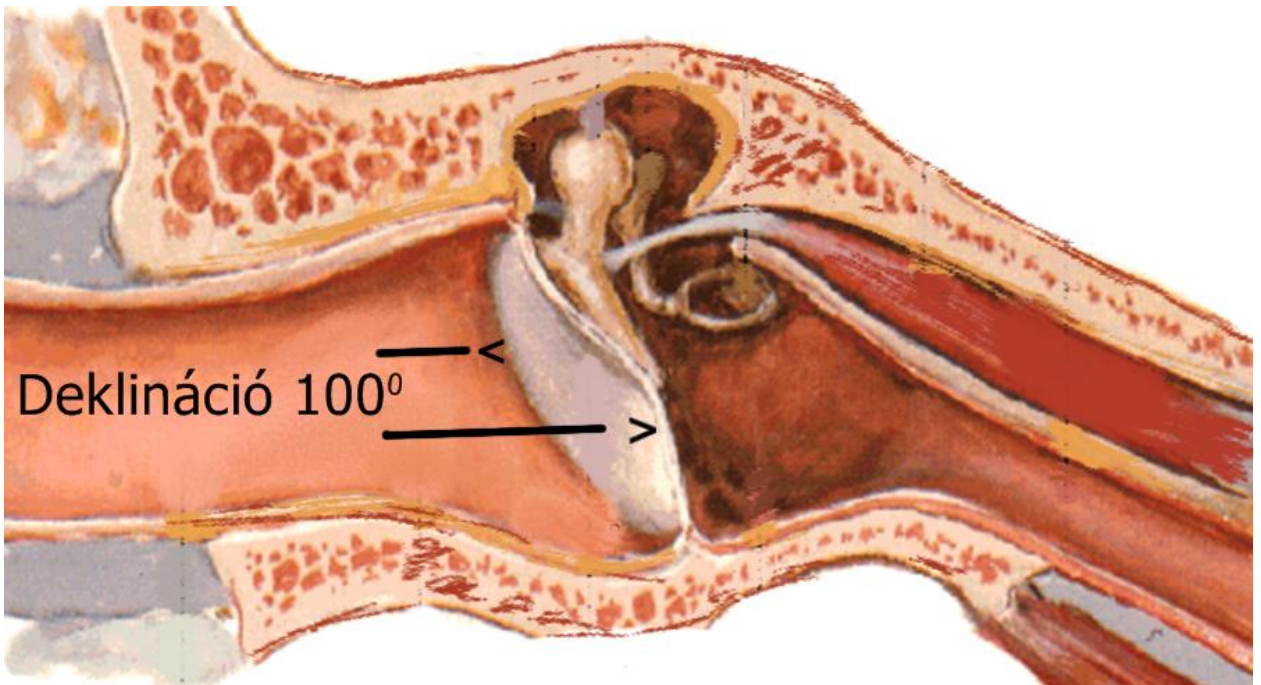


Fig. 1.10. Tympanic membrane declination.

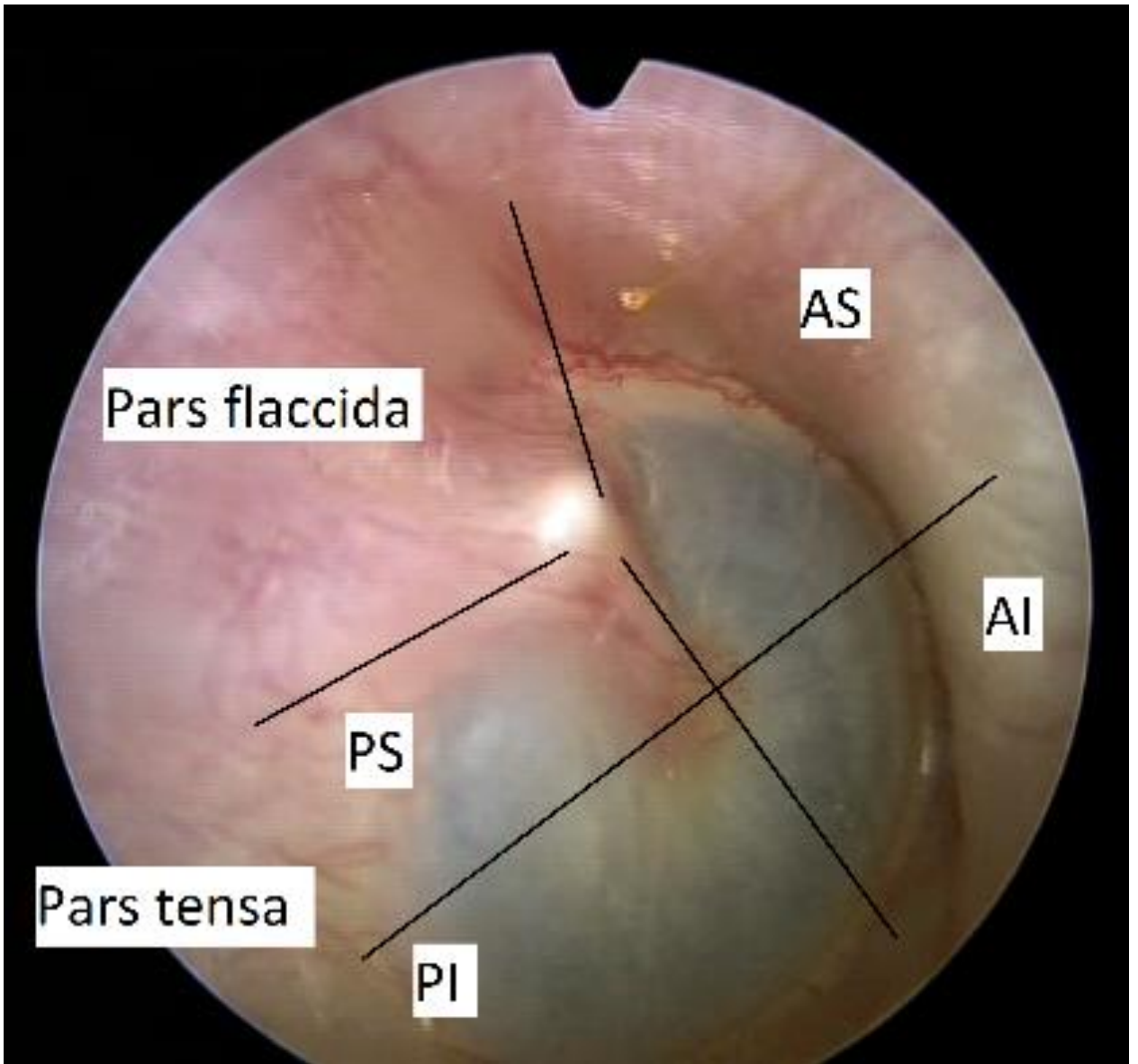
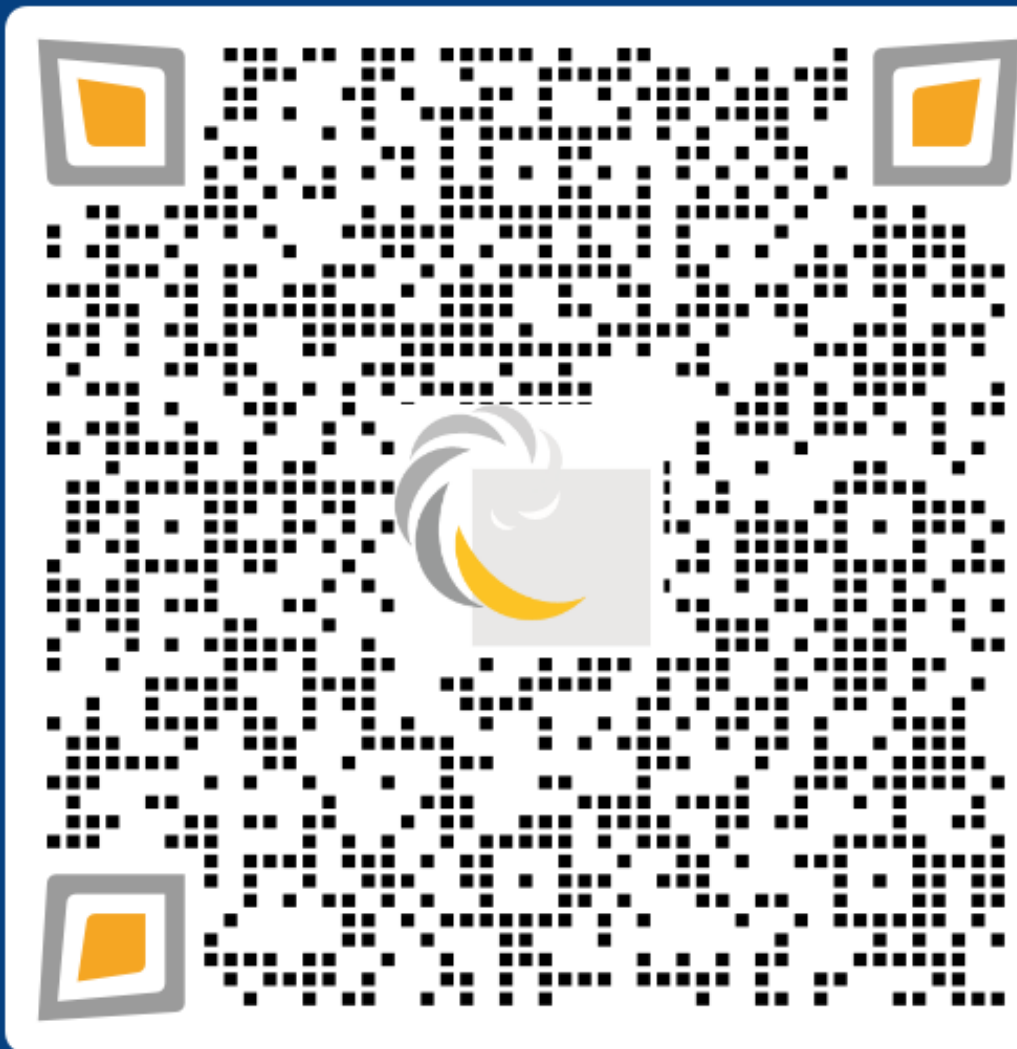


Fig. 1.11. Parts and quadrants of the tympanic membrane.

WATCH THE PRACTICAL VIDEO OF THE EAR EXAMINATION.

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SCAN ME

CLINICAL ILLUSTRATIONS:



Fig. 1.12. A unique esthetic look of the pinna.



Fig. 1.13. Congenital malformation of the pinna

- *Anotia* – No auricle
- *Microtia* – the small, deformed auricle
- *Macrotia* – the large auricle
- *Malotia* – the displaced auricle



Fig. 1.14. „Bat” ear - auriculaelevata”



Fig.1.15. Praeauric fistula and cyst



Fig.1.16. Incomplete coloboma of the helix. Uneven helical rim due to a partial fissure.



Fig.1.17. "Darwin nodule" – the cartilaginous part of the helix is broad.



Fig.1.18. *Othaematoma*



Fig.1.19. "*Cauliflower ear.*"

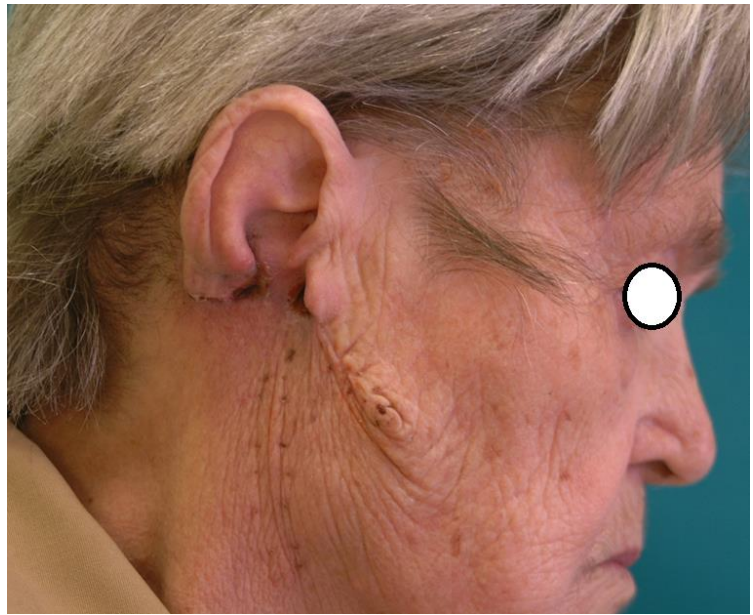


Fig.1.20. *Iatrogenic malformation – a surgical scar and a partial surgical resection of the auricle.*



Fig.1.21. *Vulnus morsum – a wound caused by a bite.*

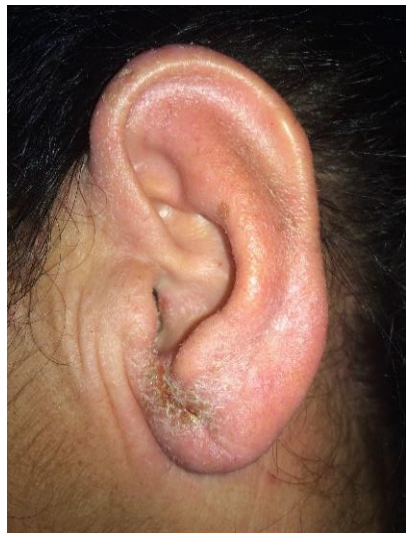


Fig.1.22. Dermatitis, erysipelas, eczema.



Fig.1.23. *Herpes zoster oticus* and left-sided facial palsy.



Fig.1.24. *Inflamed atheroma*



Fig.1.25. *Chondrodermatitis helicis*



Fig.1.26. Vascular malformation. *Haemangioma auriculae et faciei.*



Fig.1.27. *Osler-Weber-Rendu disease*



Fig.1.28. *Fibroma*



Fig.1.29. *Atheroma*





Fig.1.30. *Keloid* Fig.1.31. Dermoid cyst



Fig.1.32. Planocellular carcinoma



Fig.1.33. Basocellular carcinoma



Fig. 1.30. Congenitally narrow external auditory canal



Fig. 1.31. Congenital atresia of the external auditory canal
External ear canal infection (Otitis externa diffusa)

- bacterial
- viral
- fungal (Fig. 1.32)



Fig. 1.32. Fungal infection of the external auditory canal.



Fig. 1.33. Osteoma in the external ear canal.

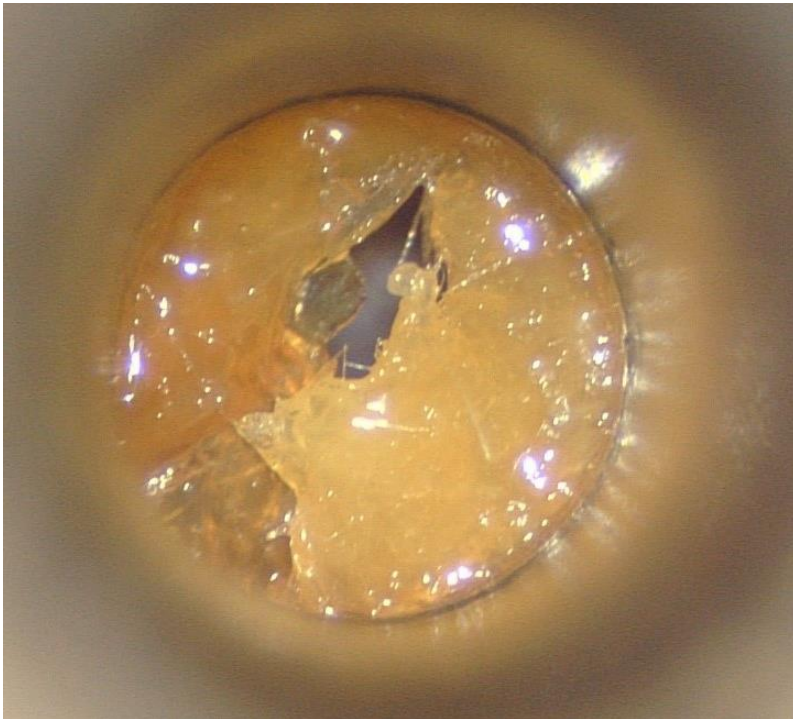


Fig. 1.34. Wax in the ear canal.

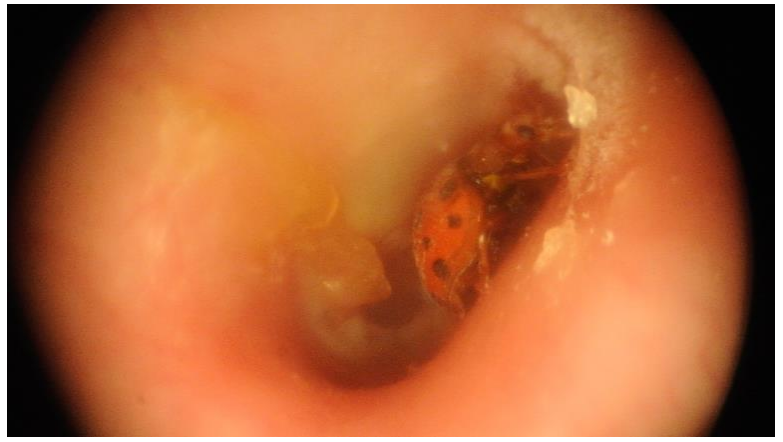


Fig. 1.35. Plastic foreign body. Fig. 1.36. Alive foreign body in the ear canal.



Fig. 1.37. Acute suppurative otitis media (Otitis media suppurativa acuta)

Changes of the tympanic membrane during middle ear infection:

Radial vascularization of the tympanic membrane → hyperaemia → swelling and total redness of the drum → hypertrophic, yellowish, bulging drum → spontaneous perforation.

Reason: usually bacterial or viral infection.



Fig. 1.38. Chronic serous otitis media (Otitis media with effusion)

(Otitis media catarrhalis chronica)

Reason: Obstruction of the Eustachian tube (e.g. adenoid hypertrophy, mass /cancer/ in the postnasal space).

Signs of a retracted tympanic membrane:

1. Missing or altered light reflex.
2. Umbo medialized.
3. Prominent lateral process of the malleus. Anterior and posterior malleolar folds are also apparent.
4. Fluid level visible via the tympanic membrane.
5. Air bubbles visible in the middle ear.



Fig. 1.39. Chronic suppurative otitis media with tympanic membrane perforation.



Fig. 1.40. Chronic suppurative otitis media with cholesteatoma (Otitis media suppurativa chronica cholesteatomatosa). Orifice of a retraction pocket is visible in the area of the pars flaccida (epitympanic region).



Fig. 1.41. Paraganglioma in the middle ear (pulsating red mass behind the drum as the tumour is highly vascularized).

Inspection

The light is directed to the patient's nose and inspect the external part of the nose and nasal vestibule. Note the shape of the nose, the dermal changes and look for disorders such as skin cancers, inflammations and traumas.

Palpation

While securing the head with one hand, bracket the nasal bridge of the patient with your index finger and thumb of your other hand and try to move it sideways. Note the mobility, the pain and the crepitation of the nasal bones. Also, note if subcutaneous emphysema is palpable. Sometimes marked deviation and uneven surface with callus formation is present due to old nasal fracture. Pain, swelling, deviation, mobility and crepitation are signs for recent nasal fracture.

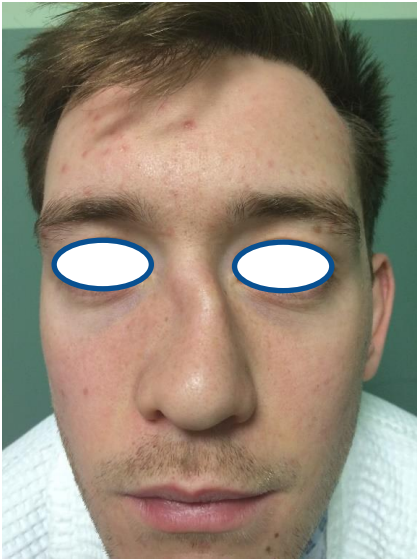


Fig. 2.1. Traumatic acute nasal fracture

Palpation of the orbital rim, the cheekbones, the zygomatic arches and the mentum are not part of the nasal examination but recommended in case of facial trauma. See details of examining patient with head and neck trauma elsewhere. Pressing on the facial exit points the trigeminal nerve (V/1, V/2, V/3) triggers pain in case of trigeminal neuralgia. Pain, when pressing on the forehead or the maxilla, occurs in acute frontal or maxillary sinusitis.

Next, a good and clear anterior view of the nasal vestibule can be obtained by pressing on the tip of the nose.



Fig. 2.2. Pressing on the tip of the nose for examining the nasal vestibule.

Examination with a nasal speculum (anterior rhinoscopy)

A headlight or head mirror and a nasal speculum (Killian or Thudicum) are required. Place the "tip" of the nasal speculum in the patient's nasal vestibule parallel to the septum not more in-depth than the intranasal skin fold and open the instruments slowly. Check the "limen nasi" (transitional line of the skin and nasal mucosa), medially the nasal septum, laterally the inferior and middle turbinates (concha nasalis inferior, concha nasalis media), the floor of the nose on the bottom and the soft palate in the back. During the examination, ask the patient to say words with the letter of "K" (Coca-Cola, coco) as this will elevate the soft palate. The moving soft palate changes the reflection of the examiner's light and will no

doubly sure the examiner that the entire length of the nasal cavity was examined. This can be important when looking for a foreign body in the nasal cavity. At the end of the examination, remove the nasal speculum with its tip open. Closing the speculum intranasally and withdrawing, it might painfully epilate some nasal hairs. Be sure to examine both nasal fossae.

Note the colour of the nasal mucosa (pink-normal, pale-anaemic, red-inflamed, bluish-allergic, black-necrotic, etc....).

Disorders on the septum: deviation, perforation, bony spines, crests and mucosal changes.

Locus Kiesselbachi or Little's area is located on the anterior third of the nasal septum and consists of branches of different nasal arteries. Anterior nose bleeds most often originate from this site.

Examination with a scope (nasal endoscopy)

Rigid 0⁰-30⁰ - 45⁰ - 70⁰ endoscopes (Hopkins rod) or flexible fiberscopes should be used for a thorough examination of the nasal fossae, the mucosa having been sprayed with a surface anaesthetic. Nasal endoscopy provides a clear, magnified, detailed picture of the nasal anatomy and pathology. Besides, with "angled vision scopes" one can look behind corners to explore hidden anatomical sites.



Fig. 2.3. Speculum examination.



Fig. 2.4. Nasal endoscopy with Hopkins rod.

Nasal anatomy

External nose:

Cranial 1/3 (nasal bridge) is bony (os nasale, os frontale pars nasalis and processus frontalis maxillae) (Fig. 2.5. and 2.6.and 2.7.)

Caudal 2/3 is cartilagenous (nasal dorsum, nasal alae, nasal tip, columella).

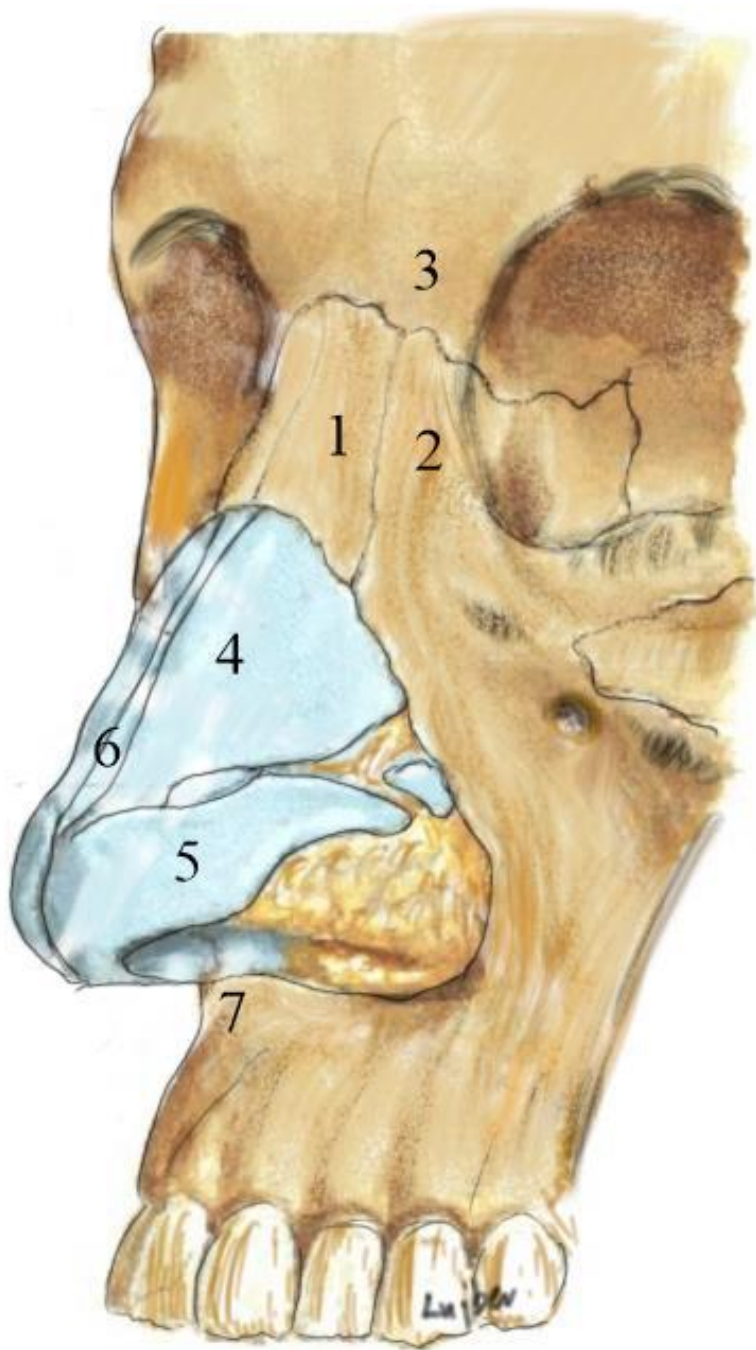


Fig. 2.5.

1. Os nasale
2. Processus frontalis ossis maxillae
3. Os frontale pars nasalis
4. Cartilago nasi lateralis (upper lateral cartilage)
5. Cartilago alaris major (lower lateral cartilage)
6. Cartilago septi nasi
7. Spina nasalis anterior

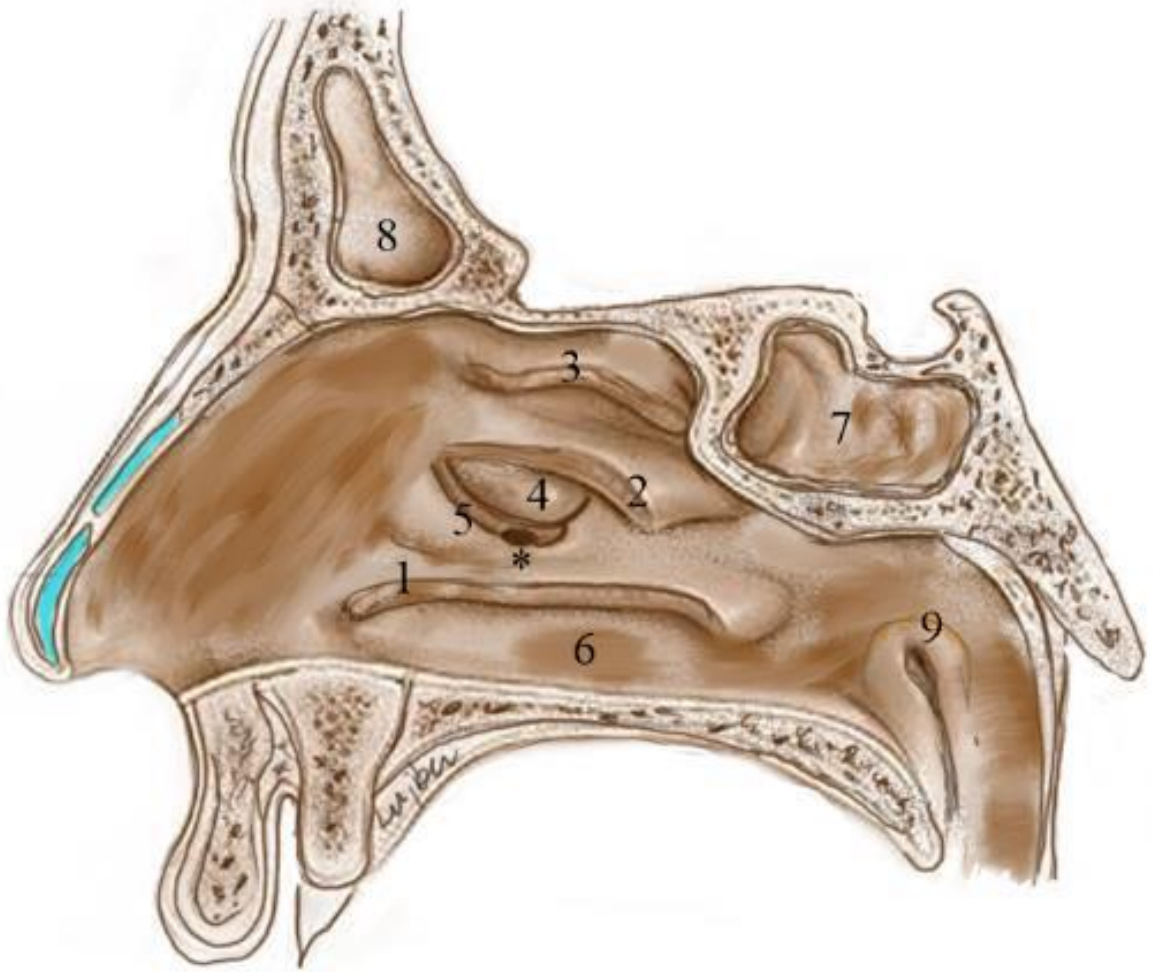


Fig. 2.6. Lateral wall of the nasal cavity.

Intranasal anatomy

1. Concha nasalis inferior
2. Concha nasalis media
3. Concha nasalis superior
4. Bulla ethmoidalis
5. Hiatus semilunaris
6. Meatus nasi inferior
7. Sinus sphenoidalis
8. Sinus frontalis
9. Torus tubarius

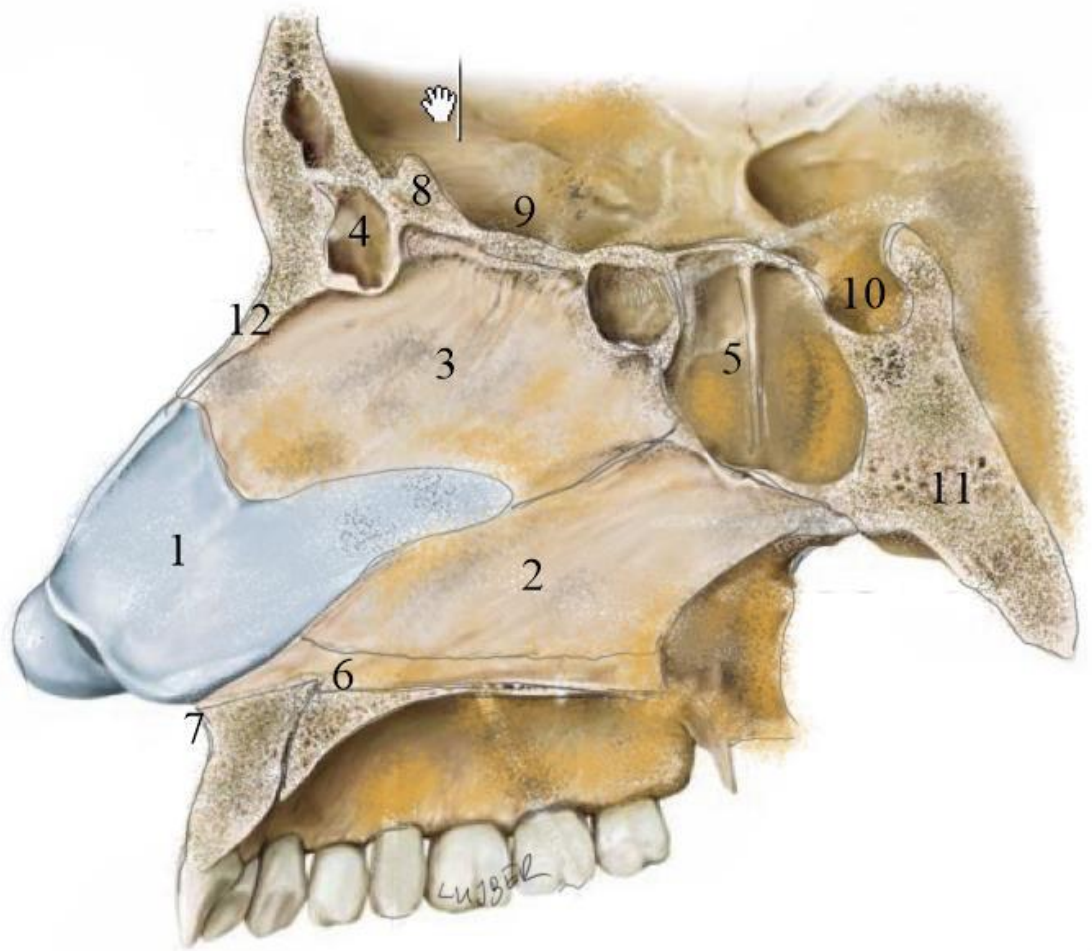


Fig.2.7. The medial wall of the nasal cavity.

1. Cartilago septi nasi
2. Vomer
3. Lamina perpendicularis ossis ethmoidalis
4. Sinus frontalis
5. Sinus sphenoidalis
6. Crista nasalis
7. Spina nasalis anterior
8. Crista Galli
9. Lamina cribrosa ossis ethmoidalis
10. Hypophysis
11. Clivus

Drainage of the paranasal sinuses and nasolacrimal duct:

Inferior nasal meatus	→	ductus nasolacrimal
Middle nasal meatus →		maxillary sinus
→		anterior ethmoid air cells

→ sinus frontalis
Superior nasal meatus → posterior ethmoid air cells

OMC-(ostio-meatal complex)

OMC is a critical functional unit of the nose at the level of the middle meatus. Proper ventilation and drainage of sinuses take place in this region. Pathological changes in this region block the drainage passages and ventilation channels of the sinuses giving rise to various nasal problems and symptoms.

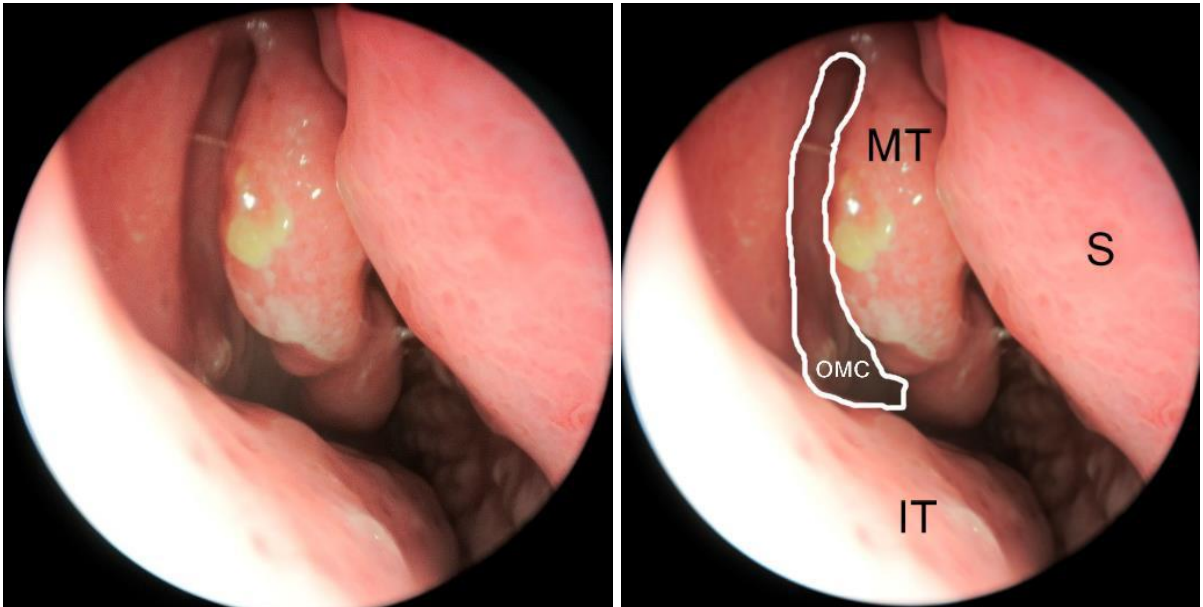


Fig. 2.8. OMC

MT- middle turbinate, IT- inferior turbinate, S- Septum, OMC- Ostio-meatal-complex

Blood supply of the nose.

ARTERIA CAROTIS INTERNA

- Ophthalmic artery
 - Anterior ethmoidal artery
 - Posterior ethmoidal artery

ARTERIA CAROTIS EXTERNA

- maxillary artery
 - Descending palatine artery
 - Sphenopalatine artery
 - Posterior nasal artery
- Facial artery
 - Superior labial artery

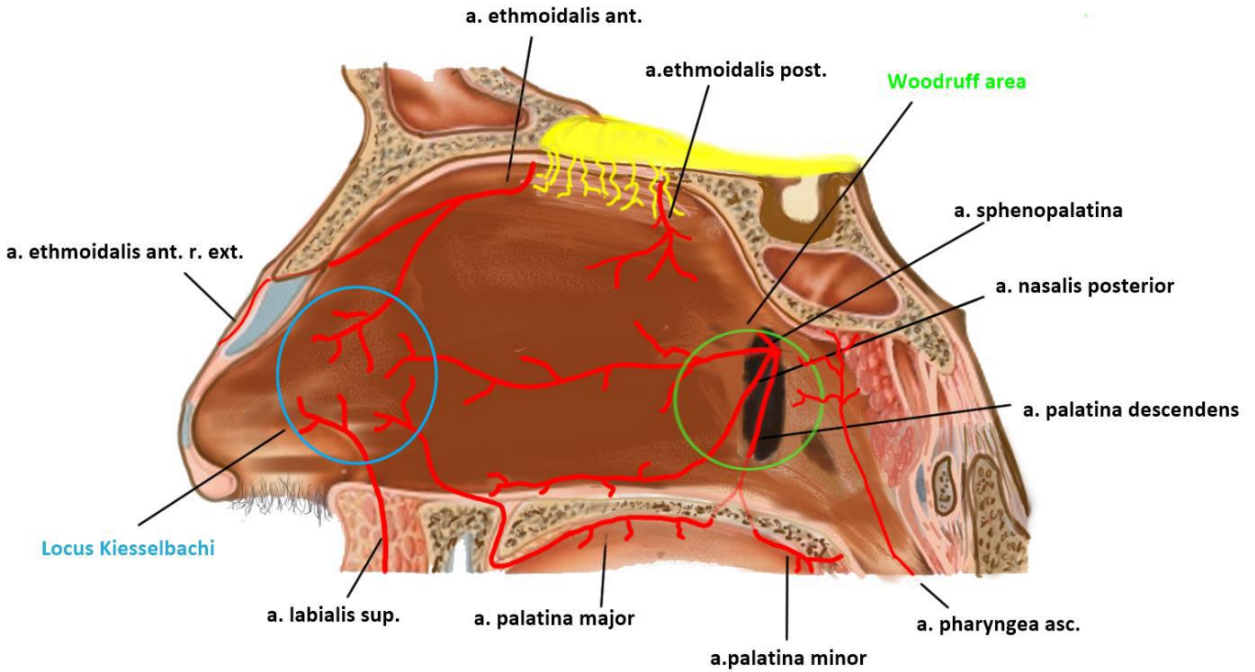


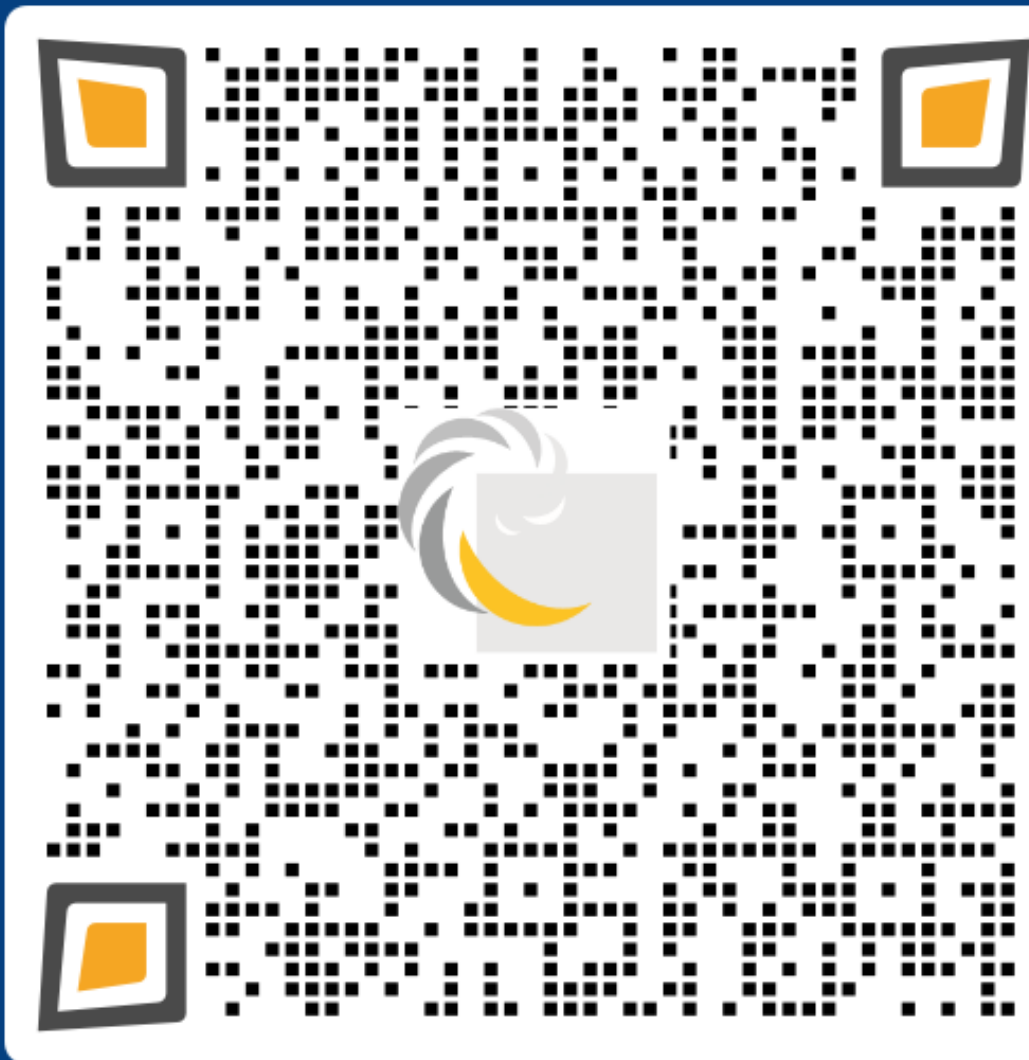
Fig. 2.9. Blood supply of the nasal cavity.

Anterior	ECA → a. maxillaris interna → a. sphenopalatina ECA → a. maxillaris interna → a. palatina major ECA → a. facialis → a. labialis superior ICA → a. ophtalmica → a. ethmoidalis anterior	}	Locus / Plexus Kiesselbachi (Little's area)
Posterior	ECA → a. maxillaris interna → a. sphenopalatina ECA → a. maxillaris interna → a. nasalis posterior ECA → a. pharyngea ascendens ICA → a. ophtalmica → a. ethmoidalis posterior	}	Woodruff plexus

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CLINICAL ILLUSTRATIONS:



Fig. 2.10. Saddle nose deformity.



Fig. 2.11. Hooked nose.



Fig. 2.12. Surgical resection.

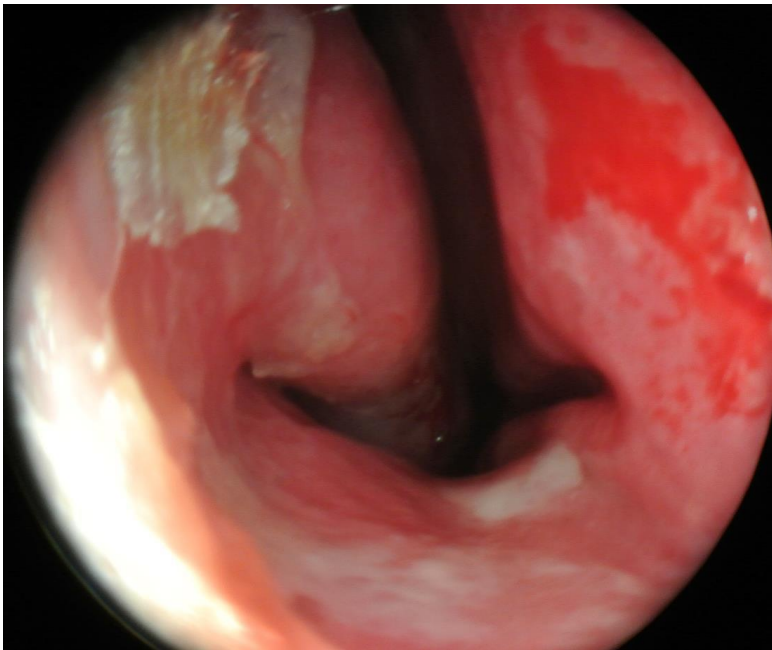


Fig. 2.13. Inflamed nasal lining.

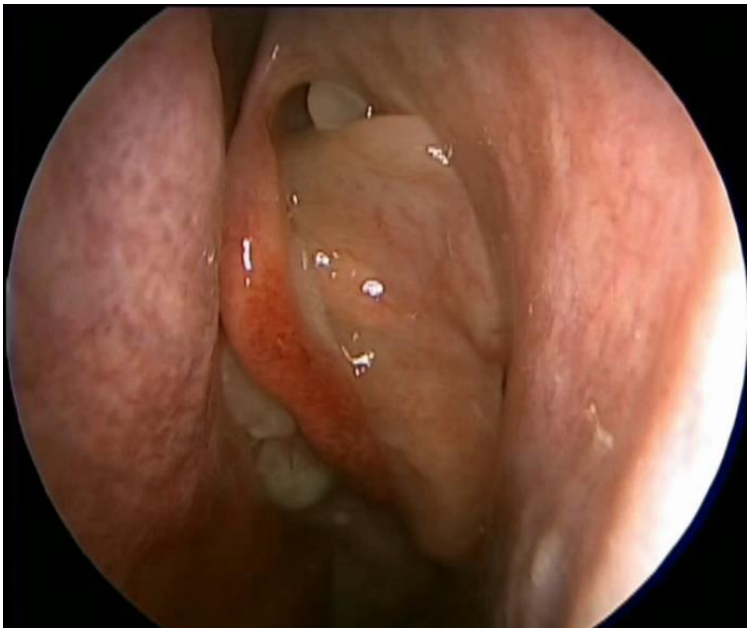


Fig. 2.14 Chronic rhinosinusitis with nasal polyps.



Fig. 2.15. Viral wart in the left nasal vestibule.



Fig. 2.16. Juvenile angiofibroma.



Fig. 2.17. Tuberous sclerosis.



Fig. 2.18. Malignant nasal skin cancer.

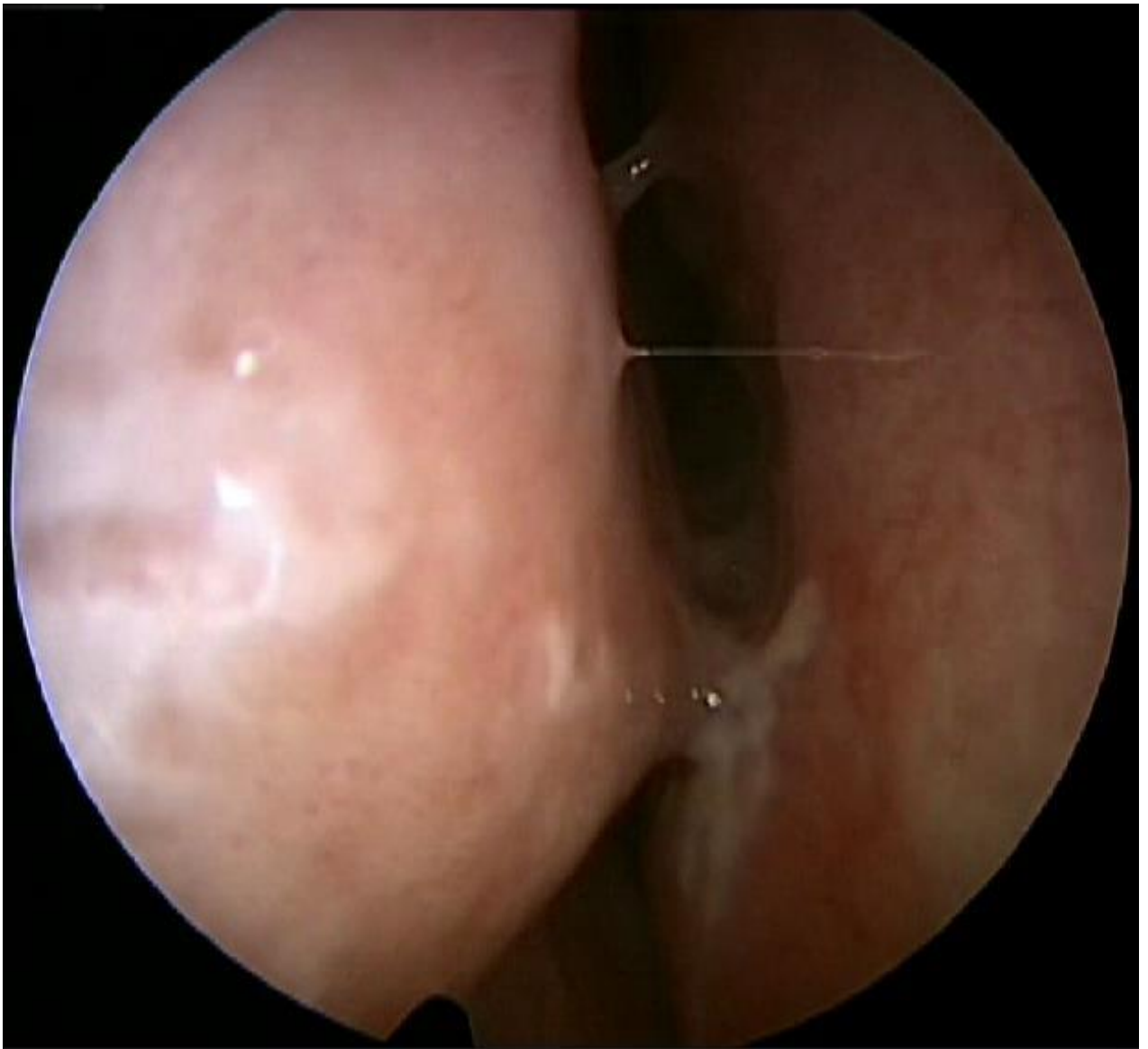


Fig. 2.19. Septal deviation with adhesions.

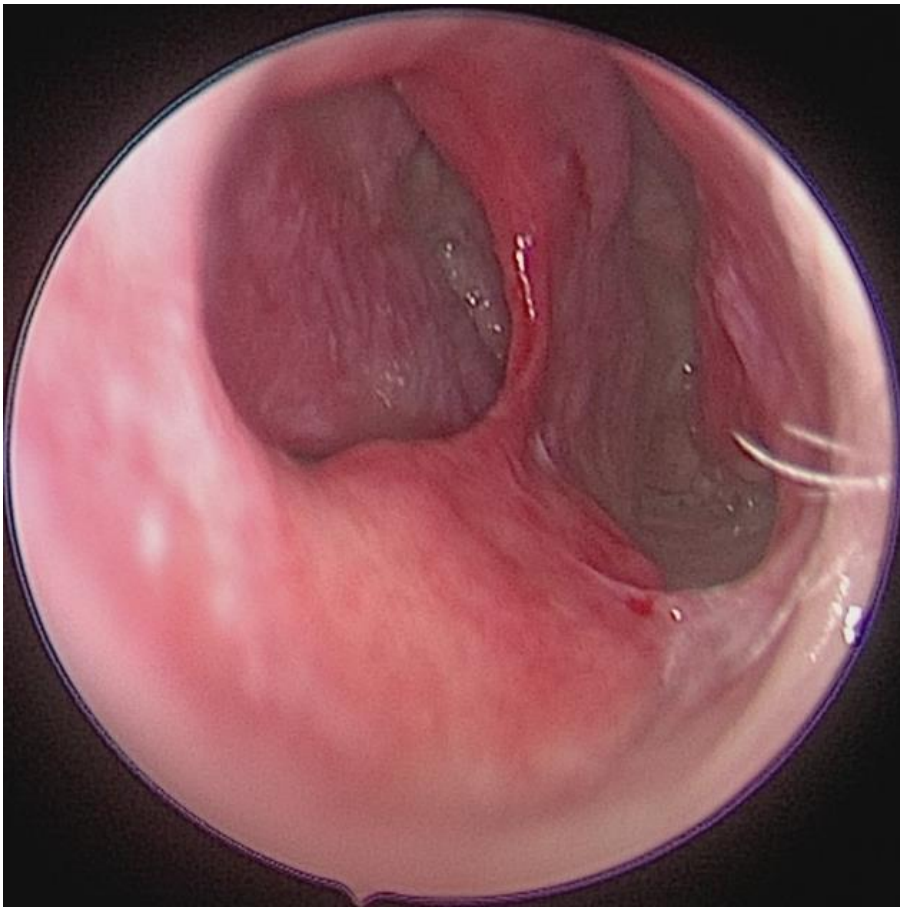


Fig 2.20. Septal perforation.



Fig. 2.21. Epistaxis.

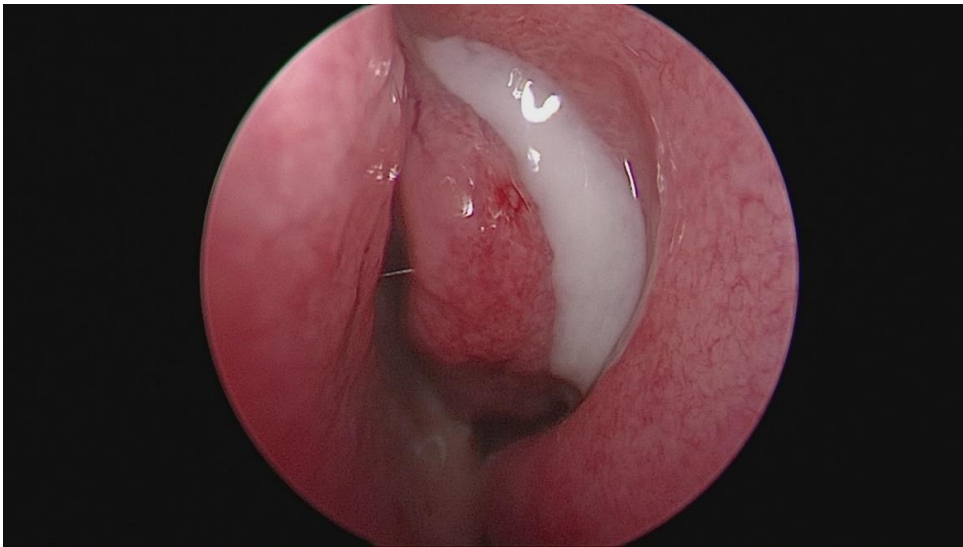


Fig. 2.22. Mucooid discharge in the left middle meatus.



Fig. 2.23. nasal polyps.

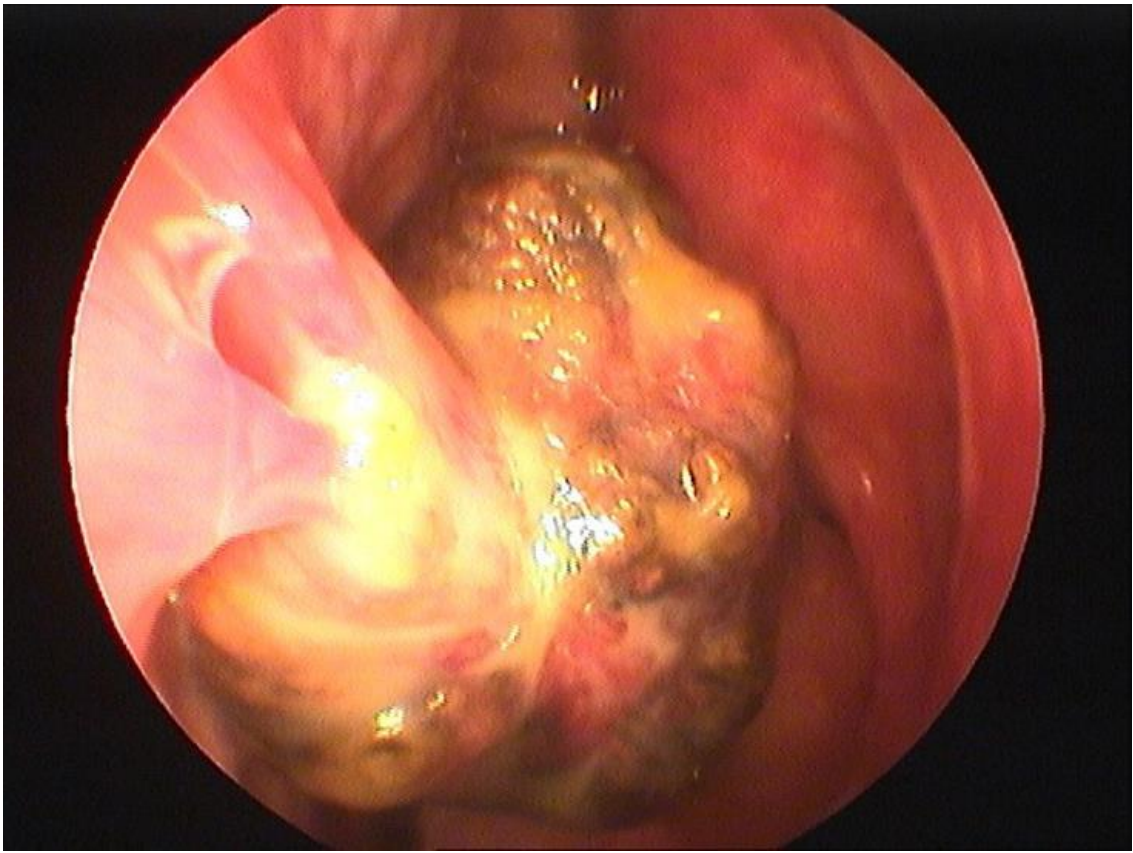


Fig. 2.24. Melanoma malignum in the left nasal fossa.

Inspection

The light is directed to the patient's mouth to inspect the lips and perioral skin. Ask the patient to open and close the mouth. Check for asymmetry and reduced mobility. The sagging of the lip on one side can be the sign of ipsilateral facial nerve palsy of the marginal branch. Note the normal or abnormal changes on the lips. Check, e.g. skin cancers, inflammations and traumas.

Palpation

Bimanual palpation of the lips, bucca, tongue, floor of the mouth and the wall of the pharynx might be necessary in case of any suspicious lesion. Palpation is usually recommended at the end of the examination to do a specific systematic "guided" palpation. Mass lesions, salivary gland stones, painful resistances or foreign bodies are to look for.

Examination with a tongue depressor

Two tongue depressors are needed to obtain a clear view of the entire oral cavity and the oropharynx. Patient vary, however, in how easy the tongue base, the fauces and the oropharynx can be seen as gag reflex and anatomical variances might make the standard examination difficult. The correct way to hold the wooden or metal tongue depressor is seen in figure 3.1.

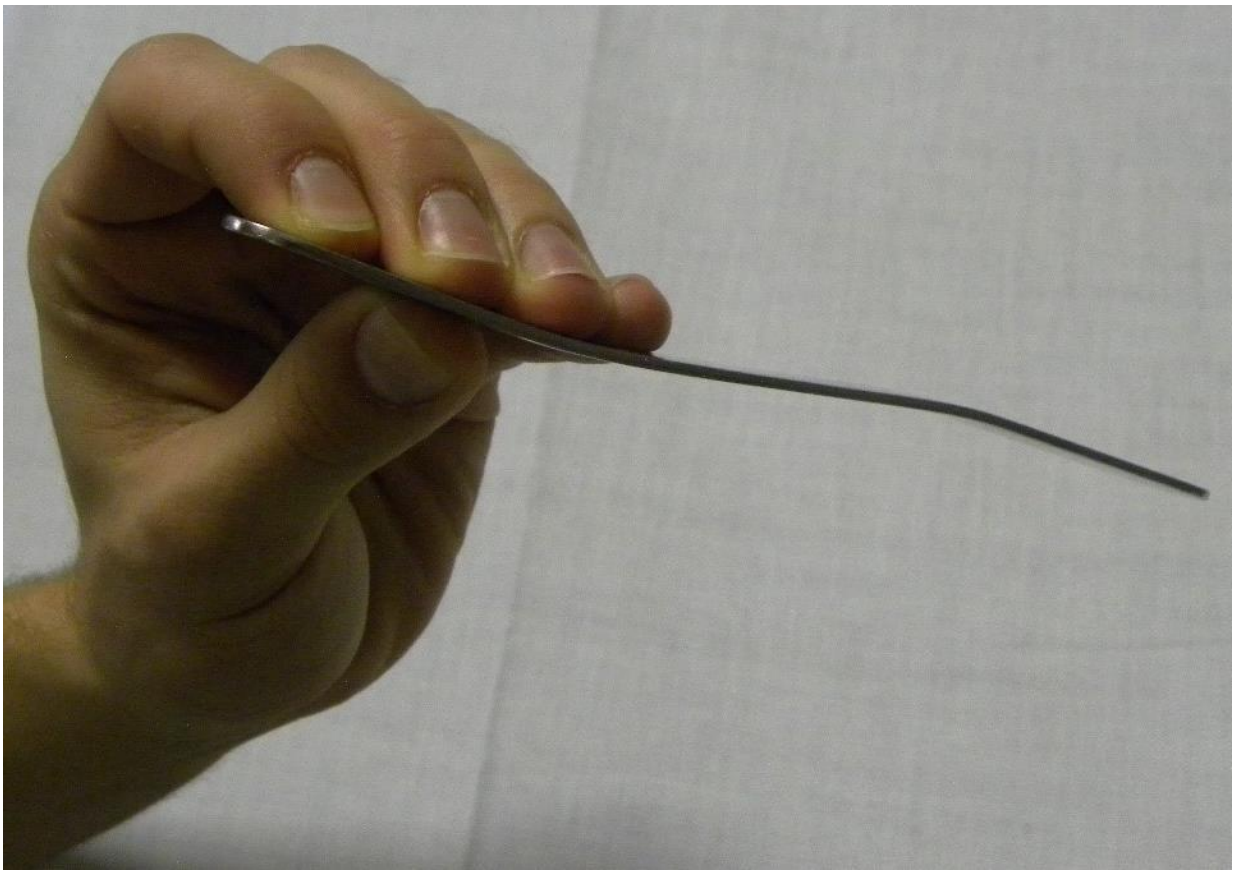


Fig. 3.1. Correct hold of the tongue depressor.

Anatomic structures to be examined in the oral cavity:

The oral cavity starts with the lips and ends at the level of the pillars and the tongue base.

- Lips
 - Superior and inferior labium, angle of the mouth
- Oral vestibule and the region of the bucca on both sides
 - Opening of the parotid gland (Stensen's / Stenon duct) located on the bucca opposite to the 2nd upper molar teeth. Applying external pressure on the parotid gland might squeeze out some secretion via the orifice. Note the consistency of the secretion (normal-clear saliva, mucoid pus-inflammation)
- Teeth (regular, caries, missing, fillings, implants, removable dentures etc..)
- Floor of the mouth
 - Frenulum linguae

- Sublingual caruncle (mucosal bulge on both sides of the frenulum with the openings of the sublingual (Bartholinus gland) and submandibular glands (Wharton's duct). Hypertrophic, hyperemic caruncula with mucoid discharge suggests a possible inflammation or a salivary calculus
- Inferior surface of the tongue.
- "Coffin`s corner" posterior part of the floor of the mouth, between the tongue base and the lower gums. The tongue should be positioned medially with the tongue depressor to visualize this site altogether. Cancerous lesions can localize here unnoticed for long.
- Tongue (check the appearance and the movement)
 - Anterior 2/3 is in the oral cavity
Posterior 1/3 is in the oropharynx
 - Tongue base (posterior 1/3) houses the circumvallate papillae, foramen coecum and the lingual tonsils. Caudally the epiglottic vallecula is visible with the medial and lateral glosso-epiglottic plicae.
 - Foliate linguae is on the margin of the tongue near the anterior pillar of the fauces.
 - Motoric innervation is by hypoglossal nerve (n. XII). Tip of the tongue deviates ipsilateral of the nerve palsy.
- Hard palate
 - Check the integrity of the mucosal lining and the shape (e.g. Gothic, Cleft palate...)

Anatomic structures to be examined in the oropharynx:

The oropharynx is also called the mesopharynx. It starts at the level of the anterior pillars and the tongue base and extends to the posterior wall of the pharynx.

Parts of the oropharynx:

- Soft palate
 - Anterior pillars (arcus palatoglossus)

- Posterior pillars (arcus palatopharyngeus)
- Palatine tonsils
- Palatine tonsils (located in the tonsillar fossae between the pillars)
 - Tonsillar size is graded see Fig. 3.2.
 - Tonsillar stones or pus can discharge when compressing on the tonsils.
- Pharyngeal wall

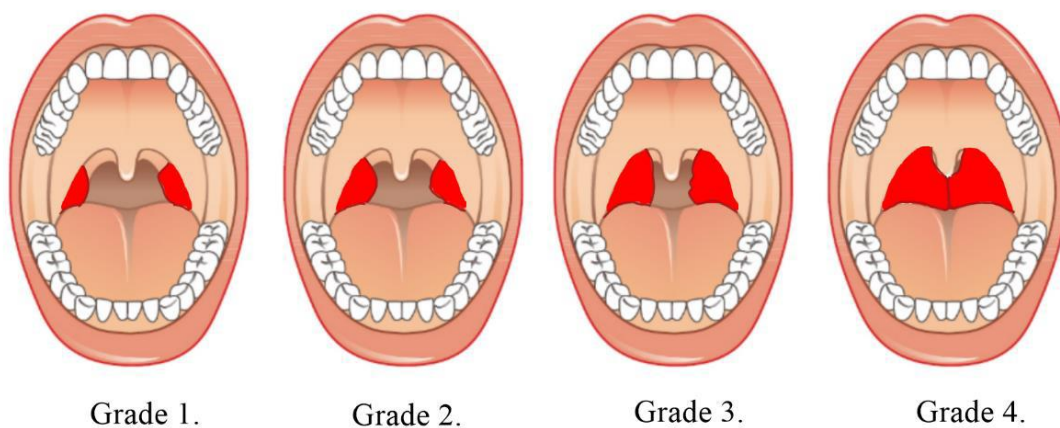


Fig. 3.2. Grading of the palatine tonsils based on its size.

Movement of the soft palate

Examining the movement of the soft palate is by asking the patient to pronounce the letter "A" while pressing down the tongue. See Fig 3.3.

Normal innervation:

Symmetric soft palate movement.

Glossopharyngeal nerve (n.IX) palsy:

Innervated side of soft palate moves upwards, uvula deviates toward the innervated side, while soft palate stays still on the paralytic side ("curtain sign")



Fig. 3.3. Oral cavity examination

Related medical terms

"Xerostomia" - Dryness of the mouth

"Ptyalismus" - Excess amount of saliva, but it remains in the oral cavity. Caused by inflammations, dentation etc.

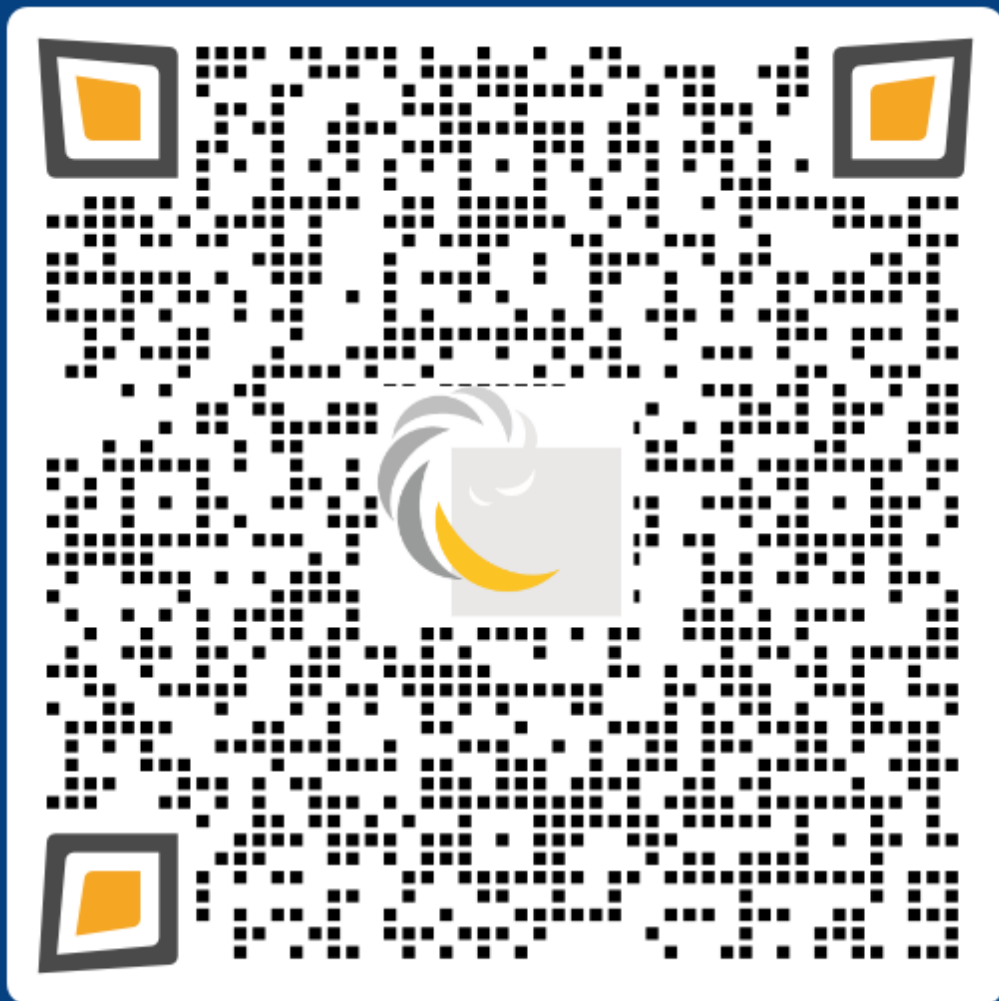
"Drooling" - Excess amount of saliva, spilling out from the oral cavity. e.g. in patients with learning difficulties.

"Foetor ex ore" - Foul smell from the mouth.

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Fig. 3.4. The post-surgical outcome of cleft lip repair.



Fig. 3.5. Infection of the lips (cheilitis).



Fig. 3.6. Angular stomatitis.



Fig. 3.7. Eczema of the lips.

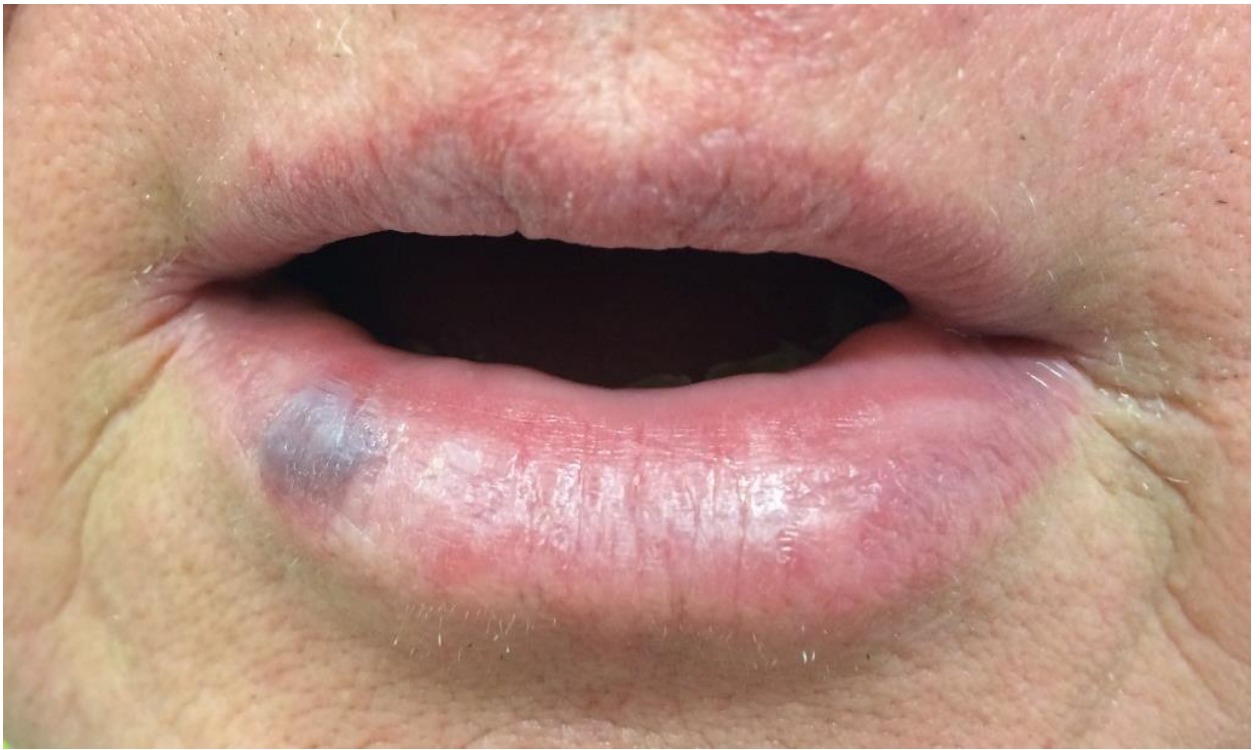


Fig 3.8. Haemangioma of the lip.

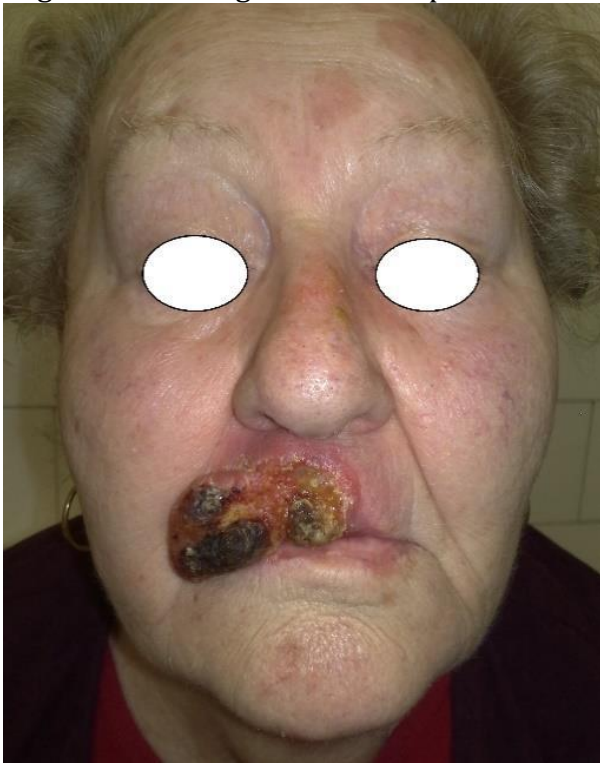


Fig 3.9. Cancer of the lip.



Fig. 3.10. Vascular malformation of the lip.



Fig 3.11. Cancer of the oral vestibule.



Fig. 3.12. Tongue-tie.



Fig. 3.13. "Strawberry tongue"- Scarlet fever.



Fig. 3.14. Lingua plicata- hereditary fissures on the surface of the tongue.



Fig. 3.15. Hairy tongue.



Fig. 3.16. Oedema of the tongue.



Fig. Tongue cancer.



Fig. 3.18. The post-surgical defect on the hard palate.



Fig. 3.19. Infection of the palatine tonsils.

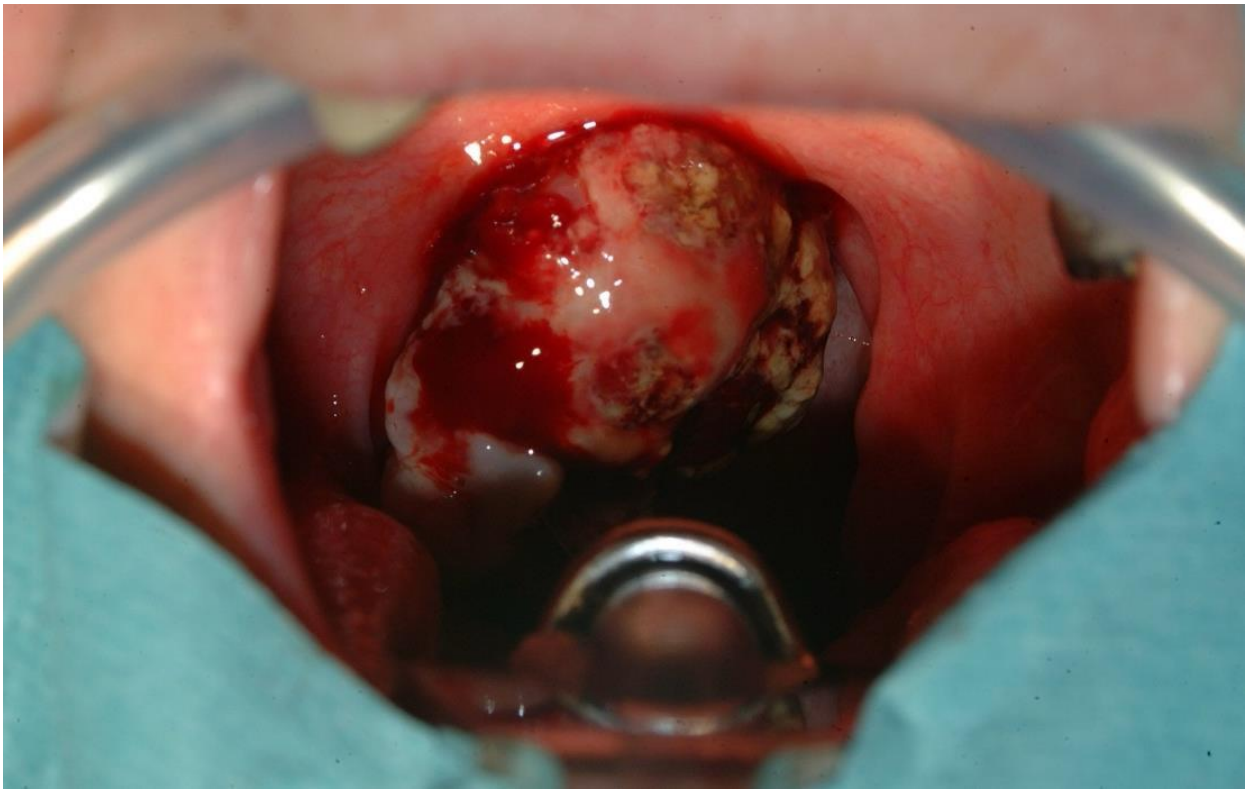


Fig.3.20. Tonsillar cancer.

Inspection

At first, the light is directed to the patient's neck to inspect the central cervical region. Look for swelling, skin lesions, discolouration and oedema.

Also observe the patient's phonation, breathing and swallowing.

Medical terms:

- Voice (phonation) problems
 - dysphonia (shaky voice, hoarseness, "raucedo")
 - *aphonia* (lack of phonation)

- Breathing
 - eupnoeic (normal breathing)
 - tachypnoea (frequency of the breathing is high)
 - bradypnea (frequency of the breathing is low)
 - hyperpnoea (deep, high volume breathing)
 - dyspnoea (breathing difficulty)
 - orthopnoea (accessory breathing muscles used while breathing)
 - stridor (loud sound while breathing)
 - inspiratory stridor (loud sound while inspiring, inhaling is with effort)→ sign of upper respiratory tract obstruction
 - expiratory breathing difficulty → caused by lower respiratory tract problems. such as bronchial asthma, COPD, emphysema

- Swallowing problems
 - *dysphagia* (swallowing difficulty)
 - *aphagia* (no swallowing ability)
 - *odynophagia* (pain during swallowing)
 - *regurgitation* (the eaten food comes back up into the mouth or nose before reaching the stomach.)
 - *reflux* (stomach content returns from the stomach to the oesophagus, pharynx, larynx, mouth or nose)
 - *aspiration* (food/liquid gets into the respiratory tract)
 - *retention* (food retains in various part of the alimentary tract.)

- Miscellaneous
 - Globus sensation-pressure feeling around the voice box
 - Subcutaneous emphysema (palpable air under the skin) Cause: perforation of hollow organs, e.g. oesophagus, lung, etc.
 - Irritative cough

Palpation

Bracket the patient's voice box with one hand and move it a few times sideways.

Normal: - Crepitation is felt, as the posterior edge of thyroid cartilage hits the patient's

corresponding vertebra.

Abnormal: - No crepitation is palpable, due to oedema, mass lesion or infection shifting the

voicebox anteriorly away from the vertebrae.

-Movement triggers pain.

Examination of the larynx with a laryngeal mirror

A headlight or head mirror and a laryngeal mirror are required. First, defog the laryngeal mirror by heating the mirror. Use electric heaters or Bunsen's burner.



Fig. 4.1. Applying heat to the instrument to defog the laryngeal mirror.

Check for the temperature of the instrument on the back of your hand before introducing the laryngeal mirror to the patient's mouth. Use an extendable handle to hold the device if necessary.



Fig. 4.2. Checking the temperature of the laryngeal mirror to avoid burn injury.

Ask the patient to put the tongue out, grab and hold it with a tissue or a gauze seen in Fig. 4.3. and introduce the laryngeal mirror to the fauces, while directing the headlight on the mirror surface. By tilting and moving the mirror, the entire laryngeal and hypopharyngeal region can be observed in an ideal anatomical situation, and if, patient's gag reflex is not too strong. The patient should be asked to say the letter "E" to check the movement of the vocal cords. Vocal cord close (adduction), and open (abduction) when speaking an "E" and inhaling alternatively.

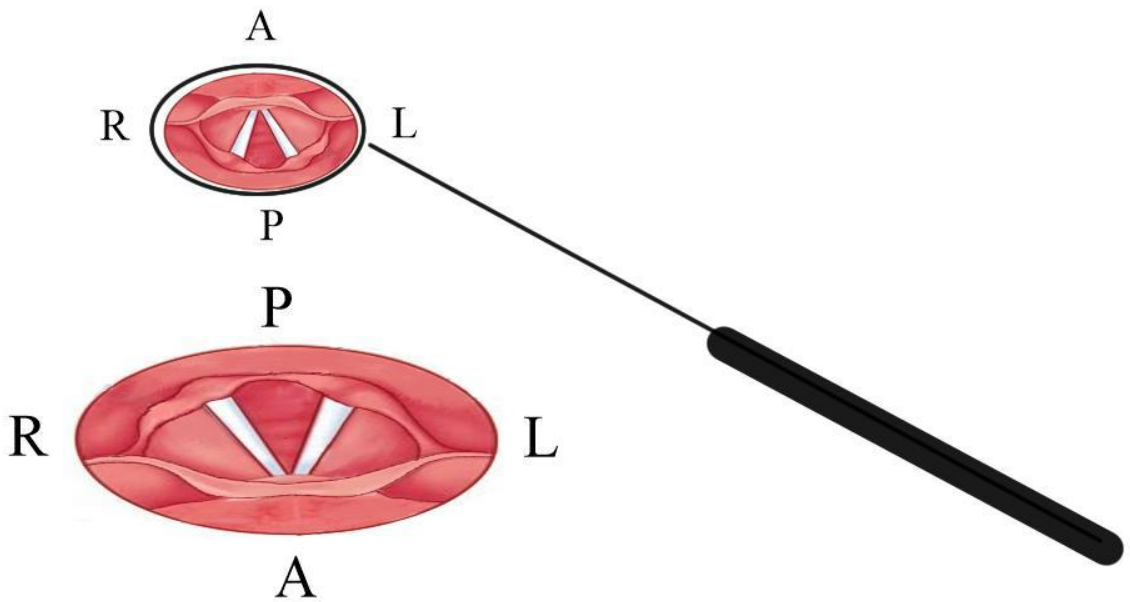


Fig. 4. 4. The image of the voice box seen in the laryngeal mirror.

Examination of the larynx with different scopes

Laryngoscope

90° or 70° Rigid endoscopes can be used to visualize the larynx and pharynx. A video camera can also be attached to perform a video-laryngoscopy. Outpatient procedure.



Fig. 4.5. Outpatient laryngoscopy with a 70° rigid endoscope

Flexible transnasal fiberoscopy

A flexible fiberscope can be passed down through the nasal cavity to the larynx—outpatient procedure.

Laryngo video-stroboscopy

Stroboscopy is a technique for demonstrating laryngeal pathology with a rigid endoscope and video camera (Fig.4.6.). It is an outpatient procedure.

Vocal cord movement, biomechanic properties and the mucosal cover of the vocal cords can be examined in magnified details. The rapid vibration of vocal cord mucosa (frequency 100/sec males, 200/sec female) is not visible with naked eyes. The movement of the vocal cords is video recorded under a stroboscopic flashing light; thus, a slow-motion video or a still picture of the vocal cords can be obtained and later analyzed. Minimal vocal cord lesions

which were hitherto undetectable can be diagnosed, for example, small laryngeal nodules, cysts, oedemas and dysplastic changes.



Fig. 4.6. Stroboscopic instruments

Direct laryngoscopy

Examination of the larynx with a microscope and a rigid laryngoscope (Fig. 4.7.) in general anaesthesia. Reliable and accurate diagnosis, biopsies and definitive surgeries can be performed during LMS (Laryngo-Micro-Surgery). Inpatient procedure.



Fig. 4.7. Laryngoscope and a rigid angled endoscope

Anatomical structure visible during a laryngeal examination

- Mesopharynx
 - Tongue base
 - Lingual tonsils
 - Epiglottic vallecula
 - Median glosso-epiglottic fold
 - Lareral glosso-epiglottic fold

- Larynx
 - Supraglottic region' subunits
 - Suprahyoid epiglottis
 - Infrahyoid epiglottis
 - Aryepiglottic fold

- False vocal cords (vestibular folds)
- (Morgagni's sac)
- Arytenoids

- Glottic region's subunits
 - Right vocal cord (plica vocalis)
 - Left vocal cord
 - (Anterior commissure)
 - (Posterior commissure)

- Subglottic region

- Hypopharynx
 - Piriform recess right side
 - Piriform recess left side
 - Postcricoid region
 - Posterior hypopharyngeal wall

TNM of the larynx

PRIMARY TUMOR (T)

- **TX:** primary tumour cannot be assessed
- **Tis:** carcinoma IN SITU

Supraglottic

- **T1:** limited to one subsite of the supraglottis, with normal vocal cord mobility:
 - suprahyoid epiglottis
 - aryepiglottic folds, laryngeal aspect
 - infrahyoid epiglottis
 - false vocal cords (ventricular folds/bands)
 - arytenoids
- **T2:** invades mucosa of more than one adjacent area (subsites), with normal vocal cord mobility:
 - subsite of supraglottis
 - glottis
 - the region outside supraglottis, e.g., the base of the tongue, vallecula, medial wall of pyriform sinus
- **T3:** limited to larynx with vocal cord fixation and/or invasion of any of the following:
 - the inner cortex of thyroid cartilage
 - paraglottic space
 - preepiglottic space
 - postcricoid area

Glottic

- **T1:** limited to the vocal cord(s) with normal vocal cord mobility (may involve anterior or posterior commissure)
 - **T1a:** limited to one vocal cord
 - **T1b:** involves both vocal cords
- **T2:** extends to supraglottis and/or subglottis, and/or with impaired vocal cord mobility
- **T3:** limited to larynx with vocal cord fixation and/or invasion of paraglottic space and/or inner cortex of thyroid cartilage

Subglottic

- **T1**: limited to subglottis
- **T2**: extends to the vocal cord(s) with normal or impaired vocal cord mobility (no cord fixation)
- **T3**: limited to larynx with vocal cord fixation and/or invasion of paraglottic space and/or inner cortex of thyroid cartilage

T4 is the same for all three sites of the larynx:

- **T4**: moderately or very advanced
 - T4a**: moderately advanced local disease:
 - invades through outer cortex of thyroid cartilage
 - invades cricoid cartilage
 - invades tissues beyond the larynx (e.g., trachea, deep extrinsic muscles of the tongue, strap muscles, thyroid gland, oesophagus)
 - T4b**: very advanced local disease:
 - invades the mediastinum
 - invades the prevertebral space
 - encases the carotid artery

REGIONAL LYMPH NODES (N)

- **NX**: lymph nodes cannot be assessed
- **N0**: no regional lymph node metastases
- **N1**: metastasis in single ipsilateral node, ≤3 cm, and no extranodal extension (ENE(-))
- **N2**
 - **N2a**: metastasis in single ipsilateral node, >3 cm and ≤6 cm, and ENE(-)
 - **N2b**: metastasis in multiple ipsilateral nodes, all ≤6 cm, and ENE(-)
 - **N2c**: metastasis in bilateral or contralateral nodes, all ≤6 cm, and ENE(-)
- **N3**
 - **N3a**: metastasis in a node, >6 cm, and ENE(-)
 - **N3b**: metastasis in a node with clinically overt ENE(+) (ENE_c)

DISTANT METASTASES (M)

"C" stands for clinical classification of cancers identified before treatment, and "p" is for the pathological classification for patients underwent surgery and histological tissue sampling.

- **cM0**: no evidence of metastases
- **cM1**: distant metastasis
- **pM1**: distant metastasis, microscopically confirmed

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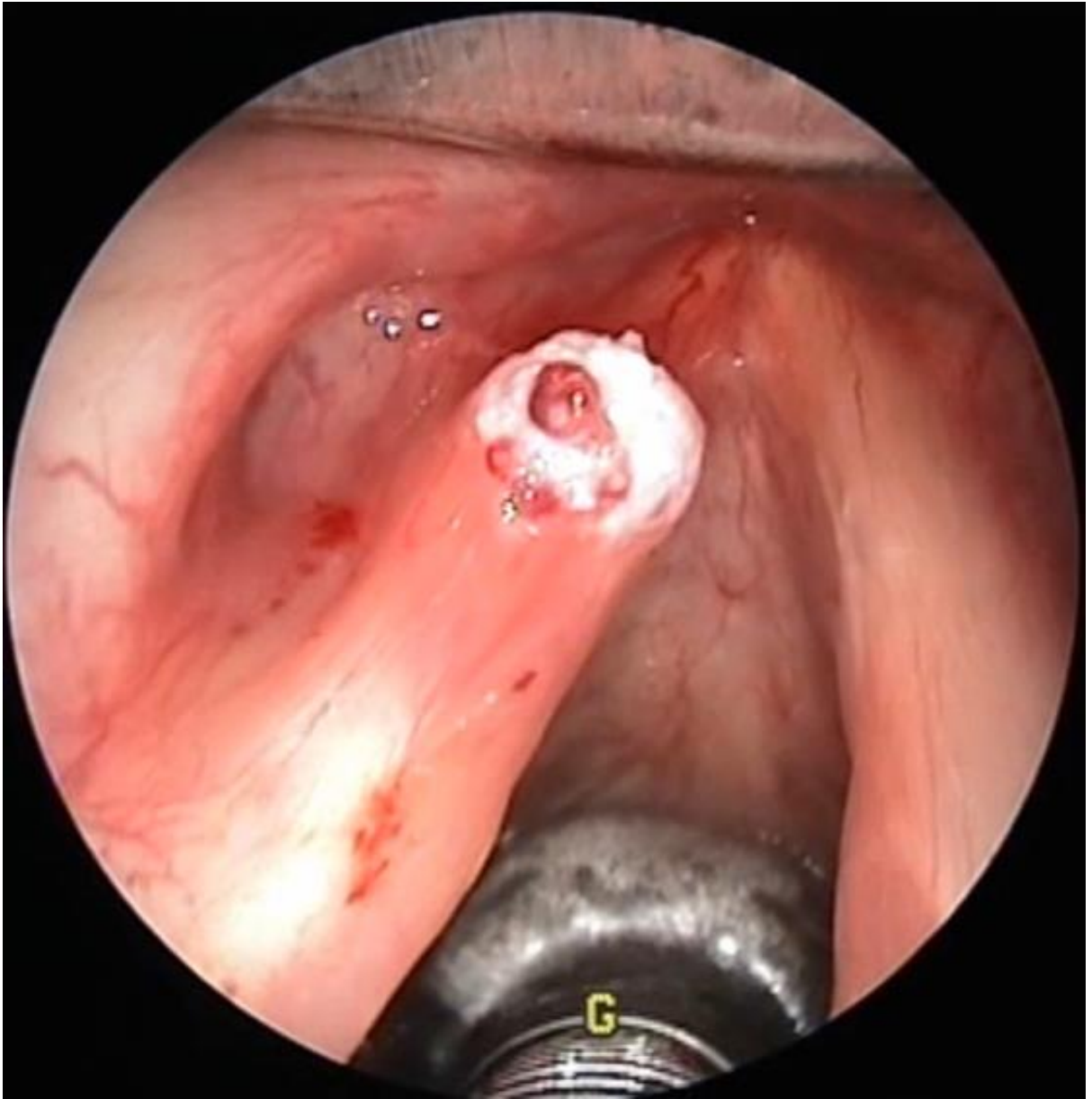


Fig.4.8. Left vocal cord cancer (T1).



Fig.4.9. Left vocal cord cancer (T1).

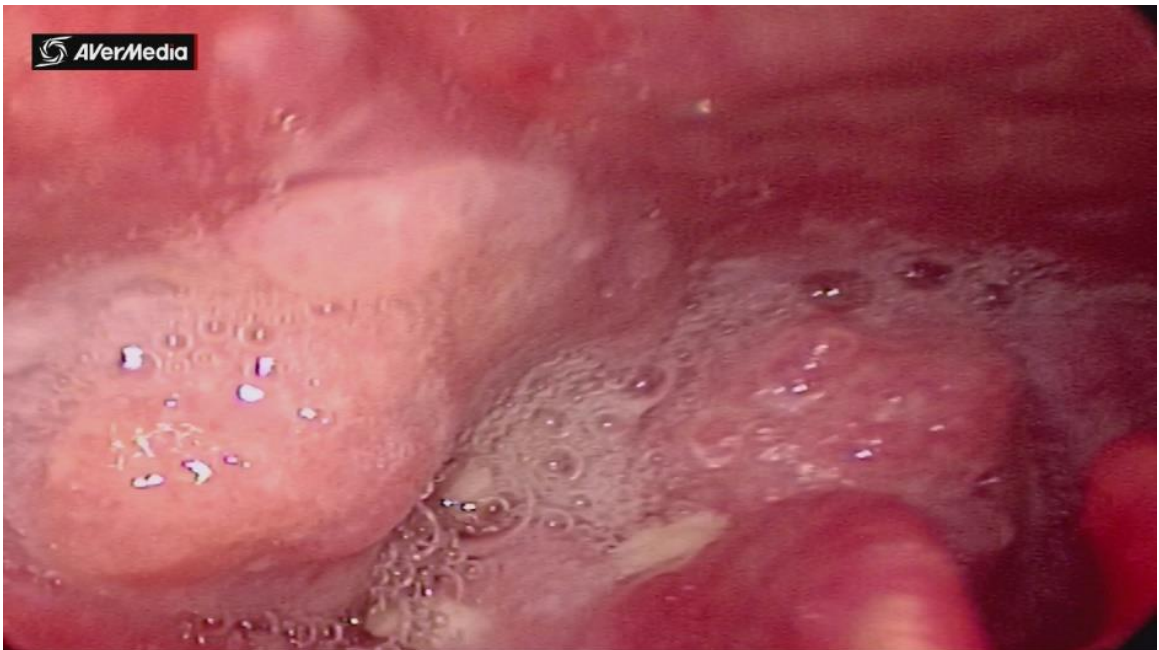


Fig.4.10. Hypopharyngeal cancer.

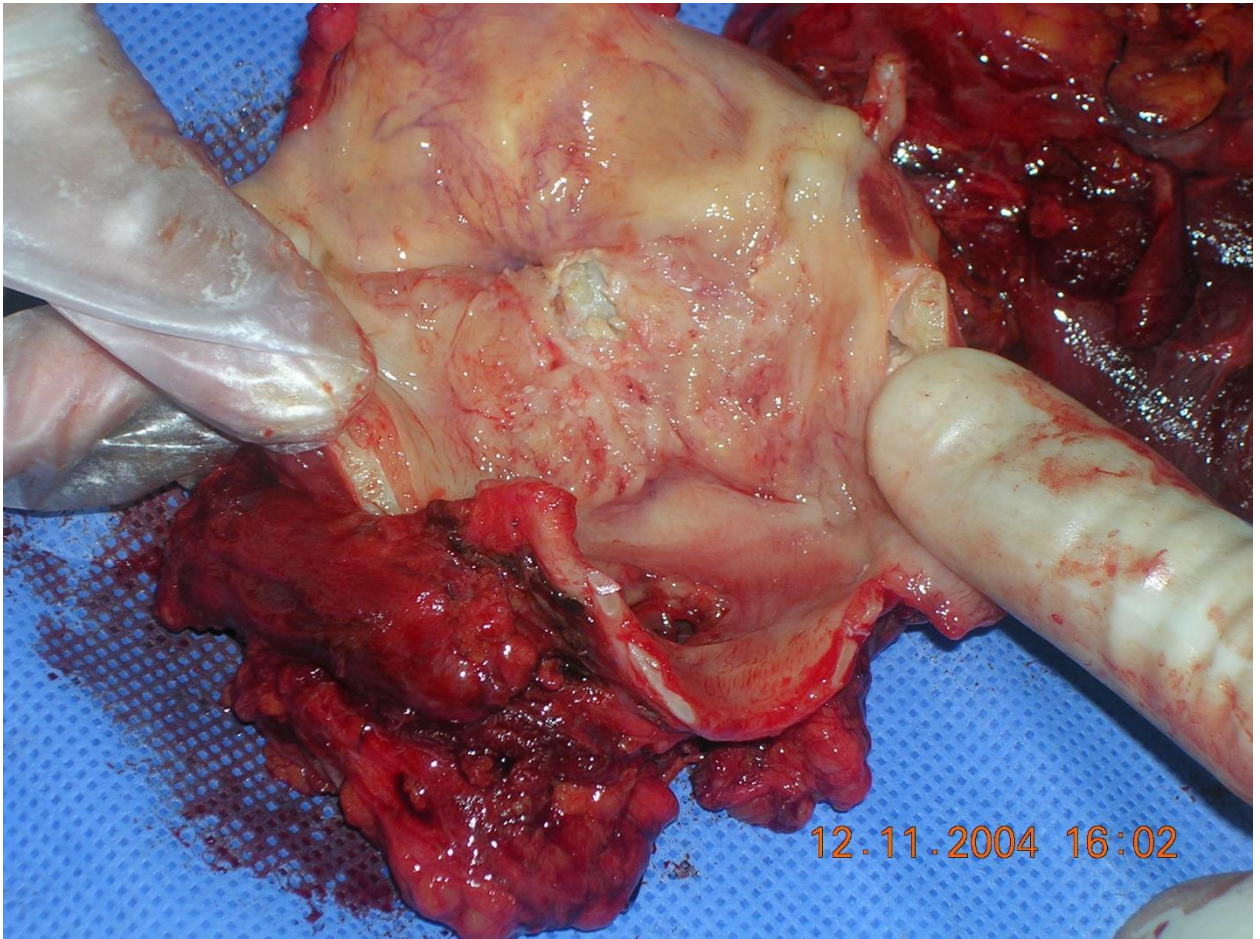


Fig.4.11. Laryngeal cancer (T3) visible in the specimen after total laryngectomy with neck dissection.

Inspection

Inspecting the nasopharynx (epipharynx) is not possible as it is located posterior to the nasal cavity. This region is also called the postnasal space. Due to its hidden location, specific symptoms should raise; however, the examiner's attention to nasopharyngeal pathology.

These symptoms are:

- Nasal voice
- Blocked nose
- Repeated sinus infections
- repeated nosebleeds
- Postnasal drip syndrome
- Lymph node enlargement in the posterior triangle of neck (cervical Level V.)
- Chronic otitis media with effusion

Examination with nasopharyngeal mirror

A nasopharyngeal mirror (diameter of 0.5-0.7 mm), tongue depressor and a headlight (or head mirror) are needed for an indirect examination of the nasopharynx. After defogging the mirror, press down the tongue of the patient and place the nasopharyngeal mirror facing upwards into the mesopharynx posterior to the uvula. Direct the headlight to the mirror to examine the postnasal space (Fig. 5.1. and Fig. 5.2.).

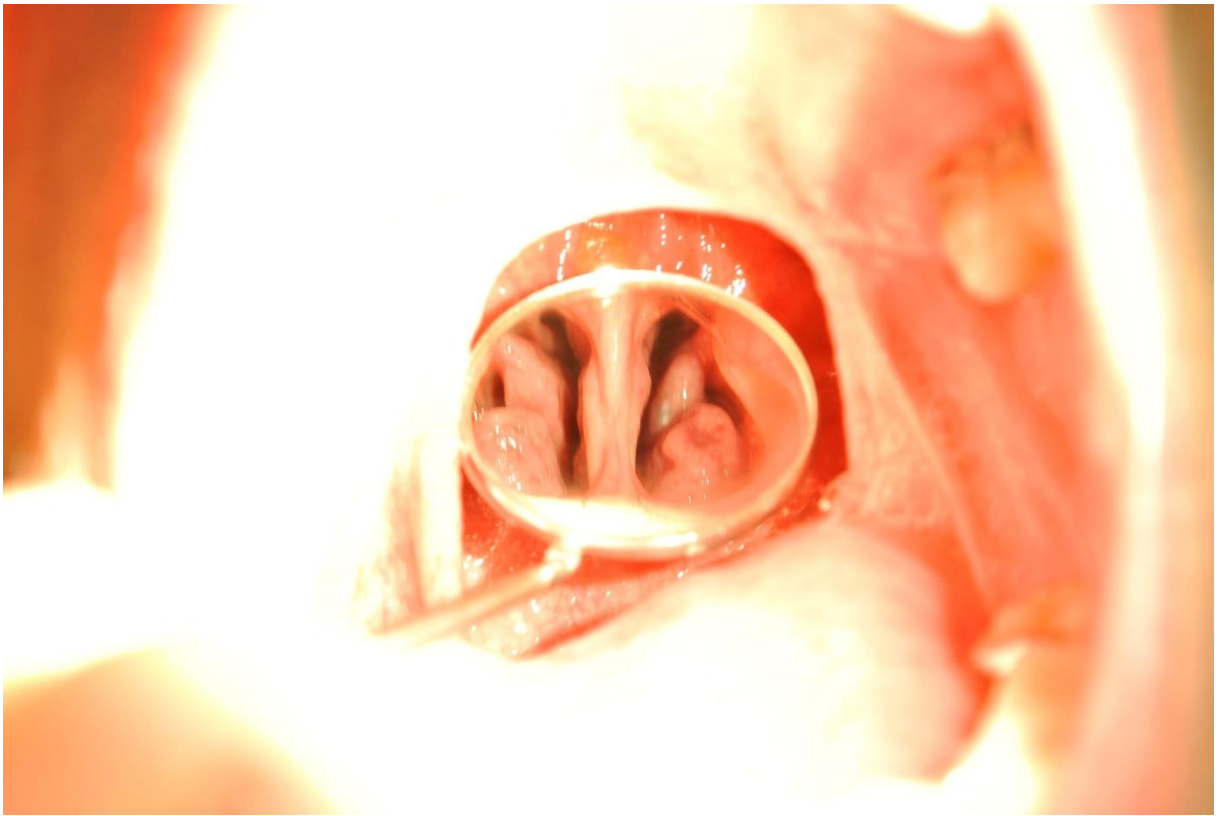


Fig. 5 .1. Trans-oral examination of the postnasal space with a nasopharyngeal mirror.

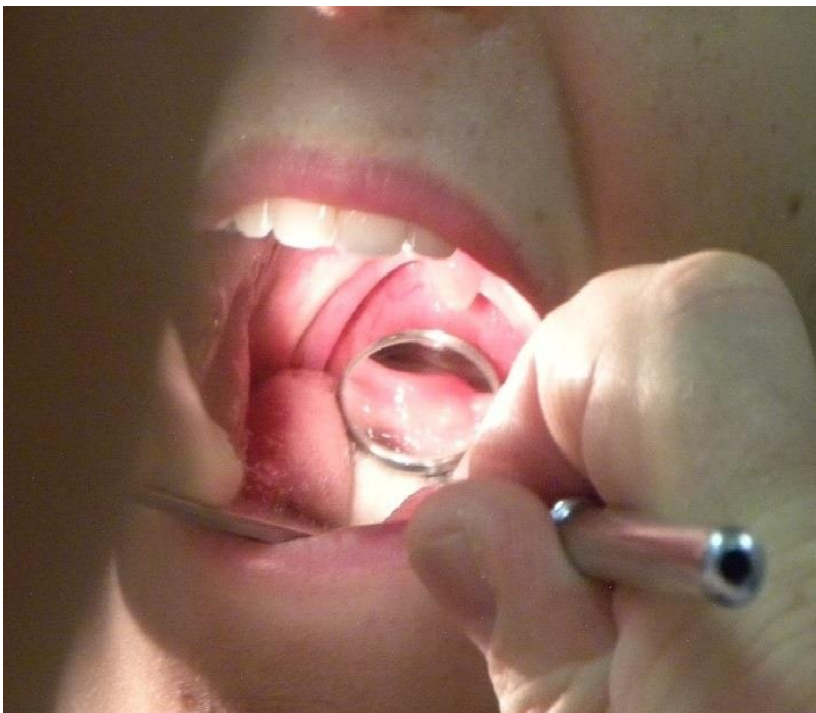


Fig. 5.2. Examination of the nasopharynx.

Anatomical structures to be examined are (Fig. 5.3.)

- Choana
- Posterior edge of the nasal septum
- Eustachian tube opening (R+L)
- Torus tubarius (R+L)
- Rosemuller's fossa (R+L)
- Fornix of the nasopharynx

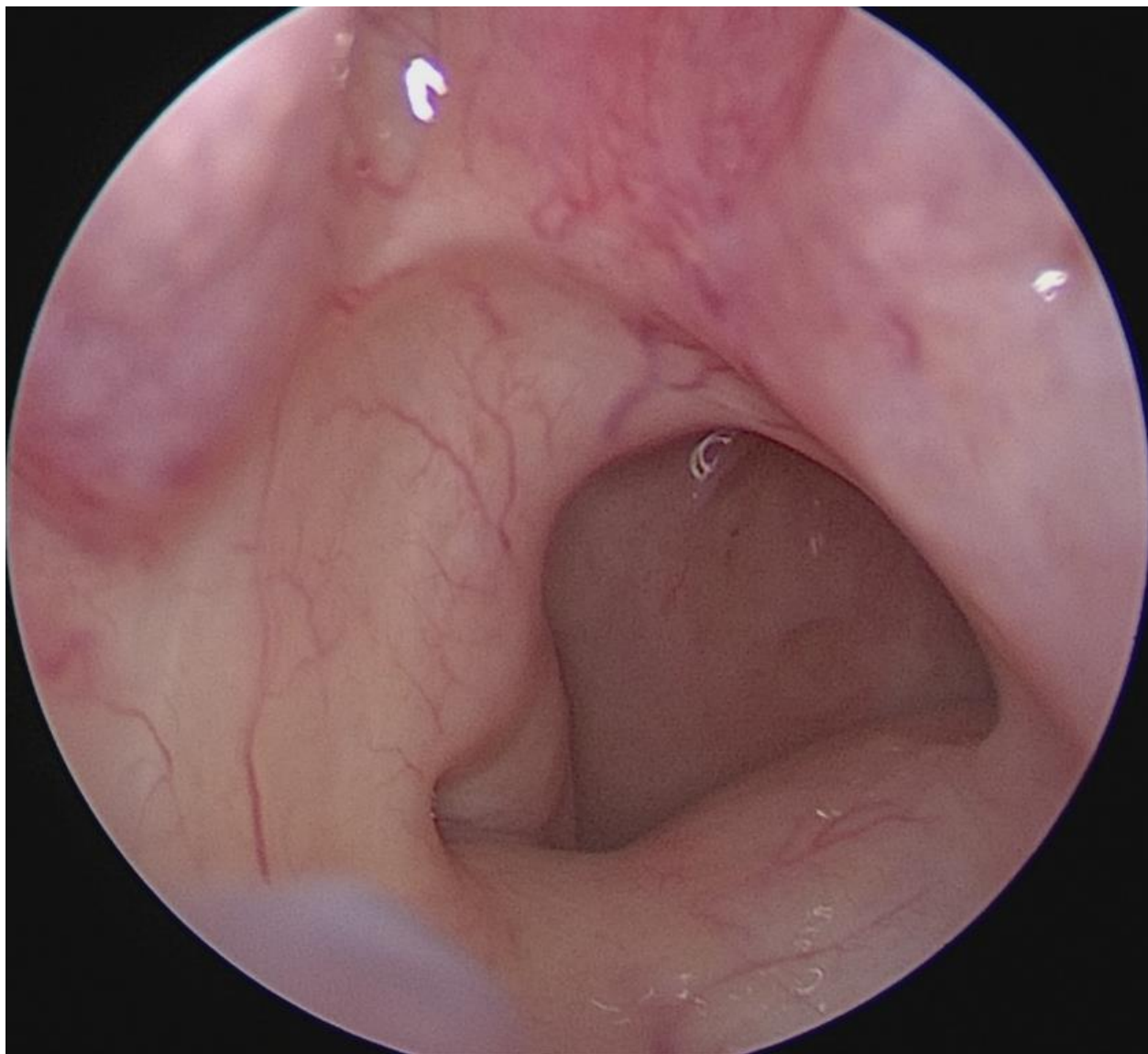


Fig. 5.3. Anatomy of the postnasal space (endoscopic view through the right nasal fossa)

Examination with a rigid nasal endoscope

A 0° or a 30° rigid Hopkins rod is introduced via the nasal fossae to visualize the nasopharynx (Fig. 5.4. 5.5.).

Examination with a flexible fiberoptic scope

The examination of the nasopharynx with a flexible fiberscope with or without decongesting the nasal lining (Fig. 5.5.).

Examination and exploration of the nasopharynx under general anaesthesia

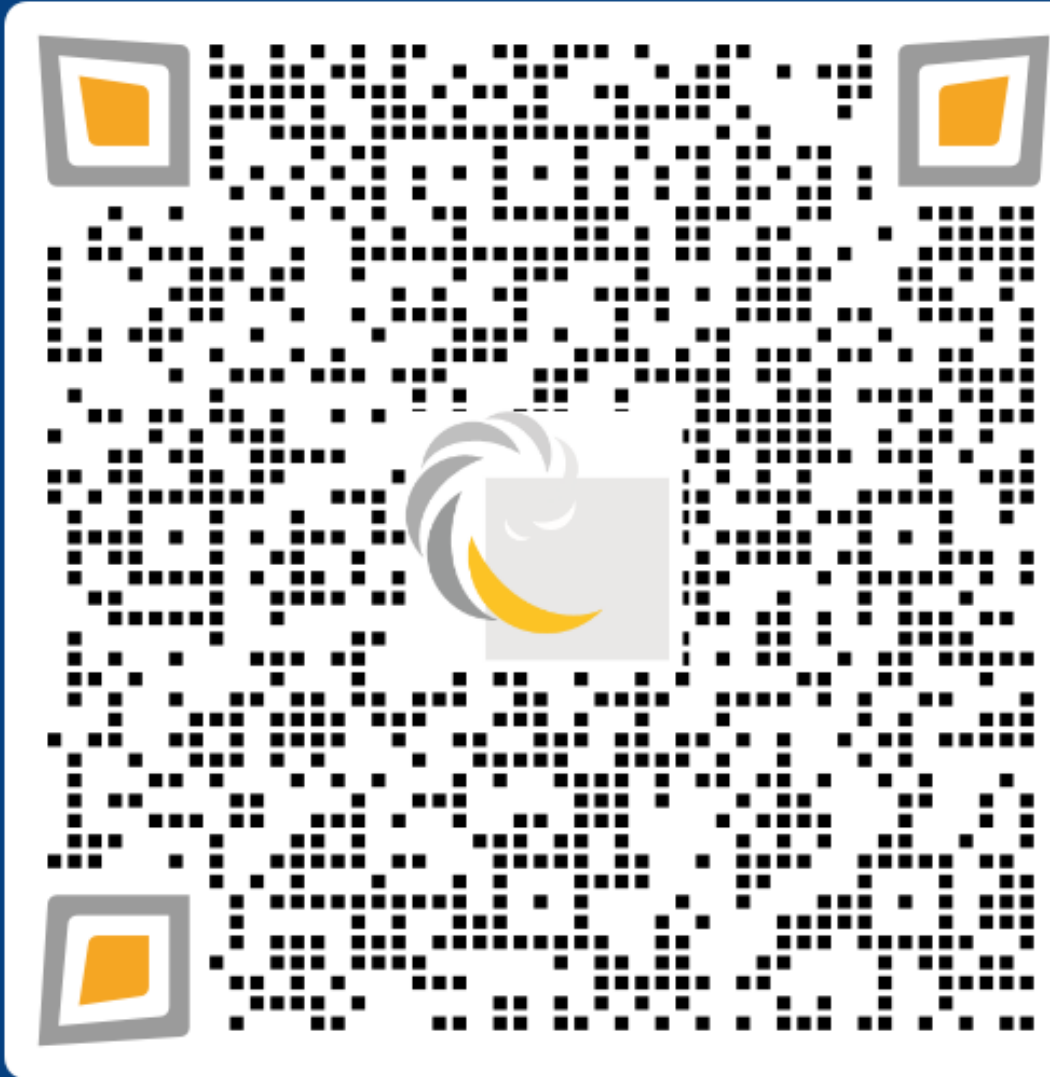
The postnasal space is explored trans-orally in general anaesthesia by elevating the soft palate with rubber bands to create more expansive space for the nasopharyngeal mirror introduction and examination. Adenoid tissue is often seen in the nasopharynx in young children (Fig. 5.6.).



Fig. 5.4. Rigid nasal endoscopy.

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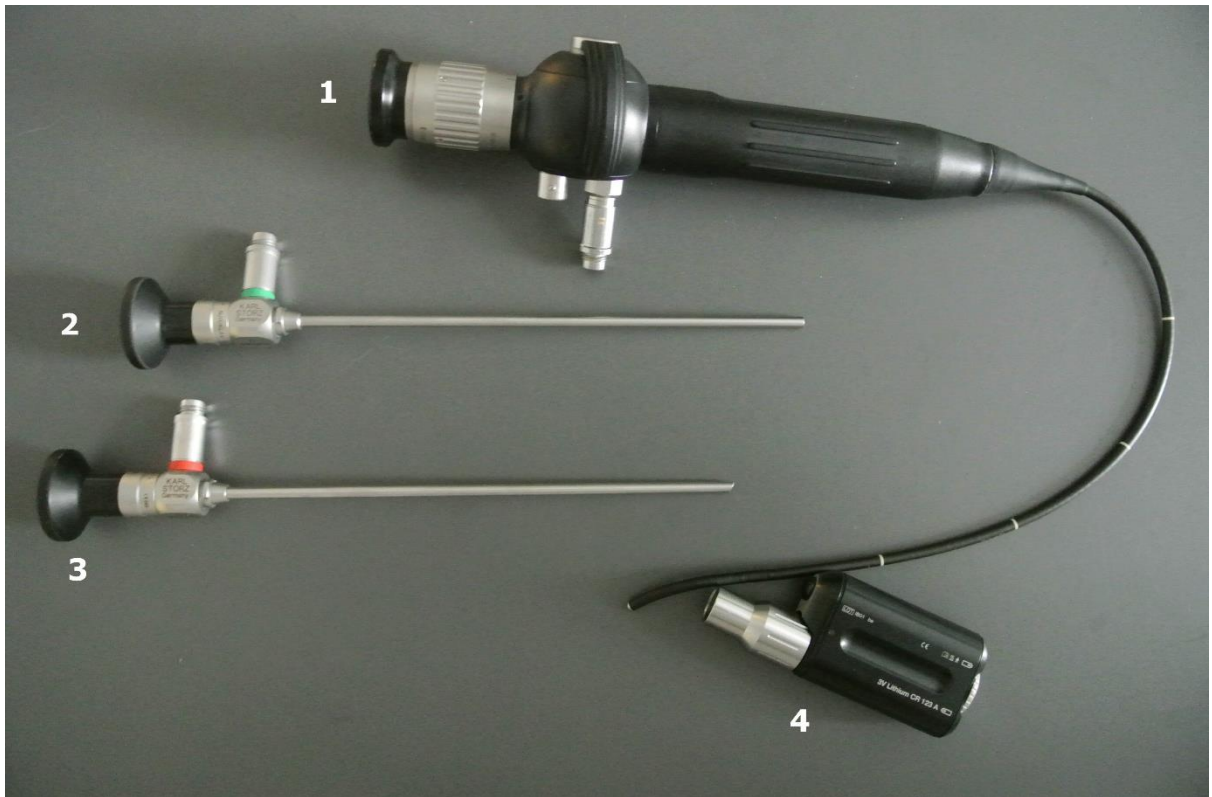


Fig. 5.5.

1. Flexible fiberscope
2. 0° Rigid nasal endoscope
3. 30° Rigid nasal endoscope
4. Pocket light source



Fig. 5.6. Adenoid tissue removed during an adenoidectomy from the postnasal space.

Inspect the patient's neck from the front first. Next, the examiner should stand behind the sitting patient and examine the neck with both hands using all the ten fingers (Fig. 6.1.).



Fig. 6.1. Examination of the neck.

The neck is divided into different levels based on the pattern of its lymphatic drainage (Fig. 6.2.). Head and neck cancers give lymphatic metastasis to lymph nodes located in a certain neck level, thus dividing the neck to levels serves the purpose of head and neck cancer staging and therapy planning.

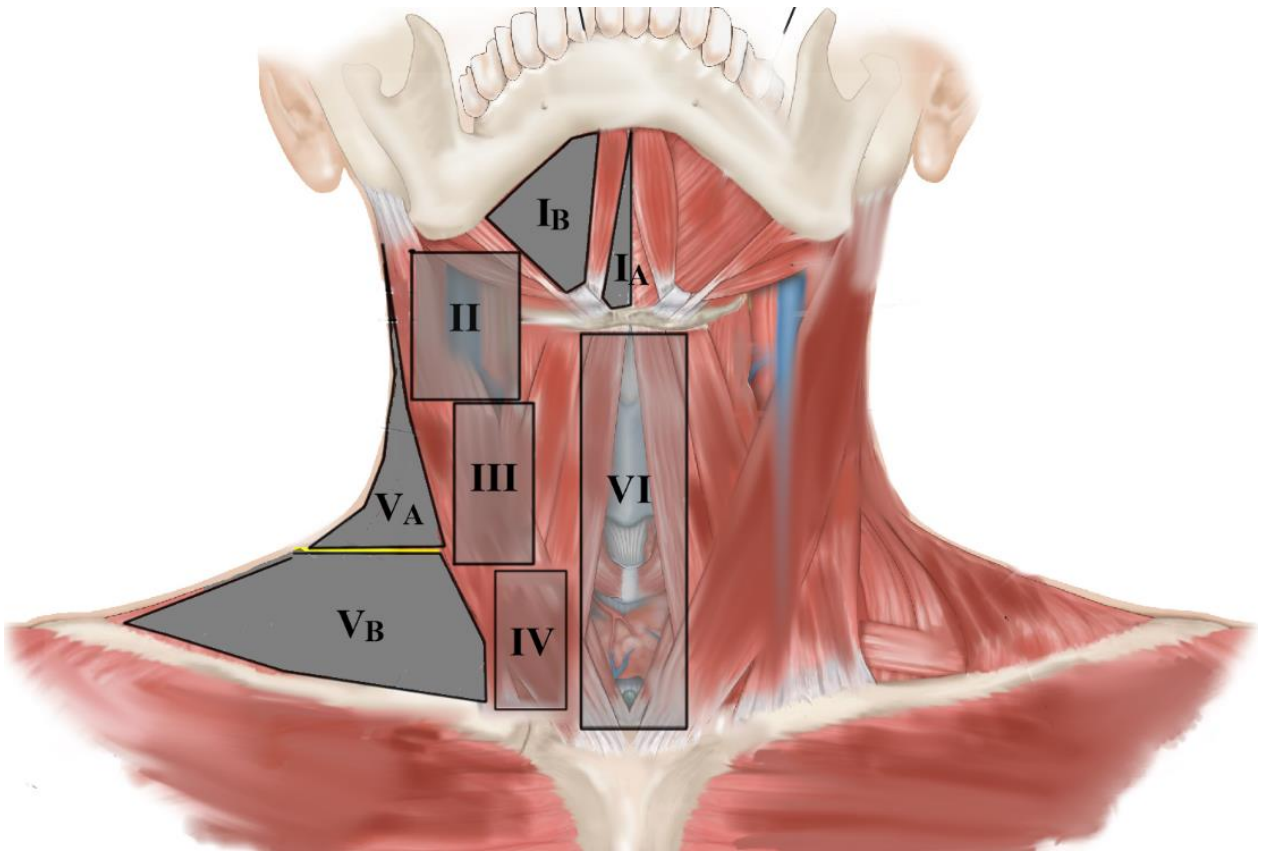


Fig. 6.2. Neck levels

Inspection

- Skin:
 - Redness –e.g. inflammation
 - Oedema – e.g. allergy
 - Infiltration – e.g. tumour invasion
- Size:
 - skinny –e.g. cachexia
 - broad –e.g. cervical lipomatosis
- Shape:
 - asymmetry
 - Unilateral swelling of lymph nodes, salivary glands, thyroid etc.

Palpation

Describe the palpated structure's

- size (cm)
- location (level, side)

- consistency (soft, stone-hard, etc.)
- mobility (fixed to its base, mobile, moves during swallowing etc.)
- sensitivity (painful, tender, no pain)

Cervical Levels:

LEVEL I: submental and submandibular

Boundaries:

- superiorly: Mandible
- inferiorly: Inferior border of the hyoid bone
- anteriorly: Raphe of the mylohyoid muscle
- posteriorly: Posterior border of the submandibular gland / posterior belly of the digastric muscle

There are two sublevels:

- **Level IA** (submental nodes):
- **Level IB** (submandibular nodes): posterolateral to the anterior belly of the digastric muscles

IA Submental Level

Boundaries: anteromedial between the anterior bellies of both digastric muscles

(R+L)

- anterior belly of the digastric muscle (posterior)
- hyoid bone (inferior)
- raphe of the mylohyoid muscle (medial)

Anatomic regions draining lymph to this level:

- Inferior lip
- Mentum
- Floor of the mouth
- Inferior frontal teeth
- Tip of the tongue

IB Submandibular Level

Boundaries:

- m. digastricus venter anterior (medial)
- m. digastricus venter posterior (posterolateral)
- mandible (superior)

Anatomic regions draining lymph to this level:

- Maxillary sinus
- Nasal cavity (anterior part)
- Superior lip
- Bucca
- Face
- Oral cavity—the floor of the mouth, tongue, hard palate, gingiva, teeth
- Submandibular and sublingual glands

Level II: Upper parajugular (internal jugular or deep cervical)

Boundaries:

- superiorly: base of the skull at the jugular fossa
- inferiorly: inferior border of the hyoid bone (radiologic-clinical border), Carotid bifurcation (surgical border)
- anteriorly: posterior border of the submandibular gland
- posterolaterally: posterior border of the sternocleidomastoid muscle
- medially: medial border of the internal carotid artery

Accessory nerve divides this level further to an anterior and posterior part, often referred to as Level IIA and Level IIB

- **Level IIA** anterior to n. XI.
- **Level IIB** Posterior to n. XI.

Anatomic regions draining lymph to this level:

Primary

- Mesopharynx
- Hypopharynx
- Larynx – supraglottic and glottic

Secondary

- *Preauricular region, retroauricular region, submental (IA)-, submandibular (IB) levels*

Level III Middle parajugular (internal jugular or deep cervical)

Boundaries:

- superiorly: inferior border of the hyoid bone (clinical border), carotid bifurcation (surgical border)
- inferiorly: inferior border of the cricoid cartilage (radiologic-clinical border), omohyoid muscle (surgical border)
- anteriorly: anterior border of the sternocleidomastoid muscle
- posterolaterally: posterior border of the sternocleidomastoid muscle
- medially: medial border of the common carotid artery, or lateral border of the sternohyoid muscle

Anatomic regions draining lymph to this level:

- Gets the lymph secondarily from Level II

Level IV Lower parajugular (internal jugular or deep cervical)

Boundaries:

- superiorly: inferior border of the cricoid cartilage (radiologic-clinical border), omohyoid muscle (surgical border)
- inferiorly: level of the clavicle
- anteriorly: anterior border of the sternocleidomastoid muscle
- posterolaterally: an oblique line drawn through the posterolateral edge of the sternocleidomastoid muscle and the lateral edge of the anterior scalene muscle
- medially: medial border of the common carotid artery, or lateral border of the sternohyoid muscle
- [includes medial supraclavicular nodes including Virchow node (L side)]

Level IV can be further divided into IVA and IVB sublevels

- **Level IVA** Sternal
- **Level IVB** Clavicular

Anatomic regions draining lymph to this level:

- Gets the lymph secondarily from Level III

Level V Posterior cervical triangle

Boundaries:

- superiorly: skull base at the apex of the convergence of sternocleidomastoid and trapezius muscles
- inferiorly: level of the clavicle
- anteromedially: posterior border of the sternocleidomastoid muscle
- posterolaterally: anterior border of the trapezius muscle

There are two sublevels:

Spinal accessory nerve divides this level in a vertical plane to a superior and inferior part.

- **Level VA:** superior half, superior to the inferior border of the cricoid cartilage (posterior to levels II and III); includes spinal accessory nodes (n.XI)
- **Level VB:** inferior half, inferior to the inferior border of the cricoid cartilage (posterior to level IV); includes lateral supraclavicular nodes and nodes along the transverse cervical artery

Anatomic regions draining lymph to this level:

- Nasopharynx

Level VI Central (Anterior) compartment

Boundaries:

- superiorly: inferior border of the hyoid bone
- inferiorly: superior border of manubrium (suprasternal notch)
- anteriorly: platysma muscle
- posteriorly: trachea (medially) and prevertebral space (laterally)
- laterally: medial border of the common carotid artery, or lateral border of the sternohyoid muscle (medial to levels III and IV)
- includes anterior jugular, pretracheal, paratracheal, prelaryngeal/precricoid (Delphian), and perithyroidal nodes

Anatomic regions draining lymph to this level:

- Thyroid glands
- Larynx - subglottic region
 - anterior commissure of vocal cord drain to Delphian nodes
- Hypopharynx-retrocricoid region
- Oesophagus cervical part

Level VII

A consensus approach has not been reached to define precisely the labelling of Level VII.

Different nomenclature is in use.

- Paratracheal / paracæsophageal
- Superior mediastinal
- Prevertebral nodes

Anatomic regions draining lymph to this level:

- Thyroid gland
- Retrocricoid region of the hypopharynx
- Posterior wall of the pharynx
- Soft palate (seldom)

Other anatomic regions of the neck:

Supraclavicular region

Radiologists may describe supraclavicular nodes separately from levels IV. and V. using the transverse level of the clavicle as the border.

Anatomic regions draining lymph to this level:

- Stomach („Krukenberg tumour”),
"Virchow lymph nodes" = left-sided supraclavicular located lymph nodes.
- Breast
- Lung ("Pancoast tumour")
- Ovarium

Occipitalis region:

Anatomic regions draining lymph to this level and diseases causing node enlargement:

- Corresponding skin of the scalp
- Rubeola = rose-rash = German measles
- Scabies

Parotid region

Anatomic regions draining lymph to this level and diseases causing node enlargement:

- Corresponding skin of the scalp
- Parotid gland
- Anterior wall of the external ear canal

- Conjunctiva – "conjunctivitis."

Posterior auricular (mastoid) region

Anatomic regions draining lymph to this level and diseases causing node enlargement:

- Corresponding skin of the scalp
- Posterior wall of the external ear canal
- Mastoiditis

Retropharyngeal nodes

Nodes locate submucosally between the pharyngeal wall and the vertebral spine.

Facial nodes

Nodes locate subcutaneous on the face.

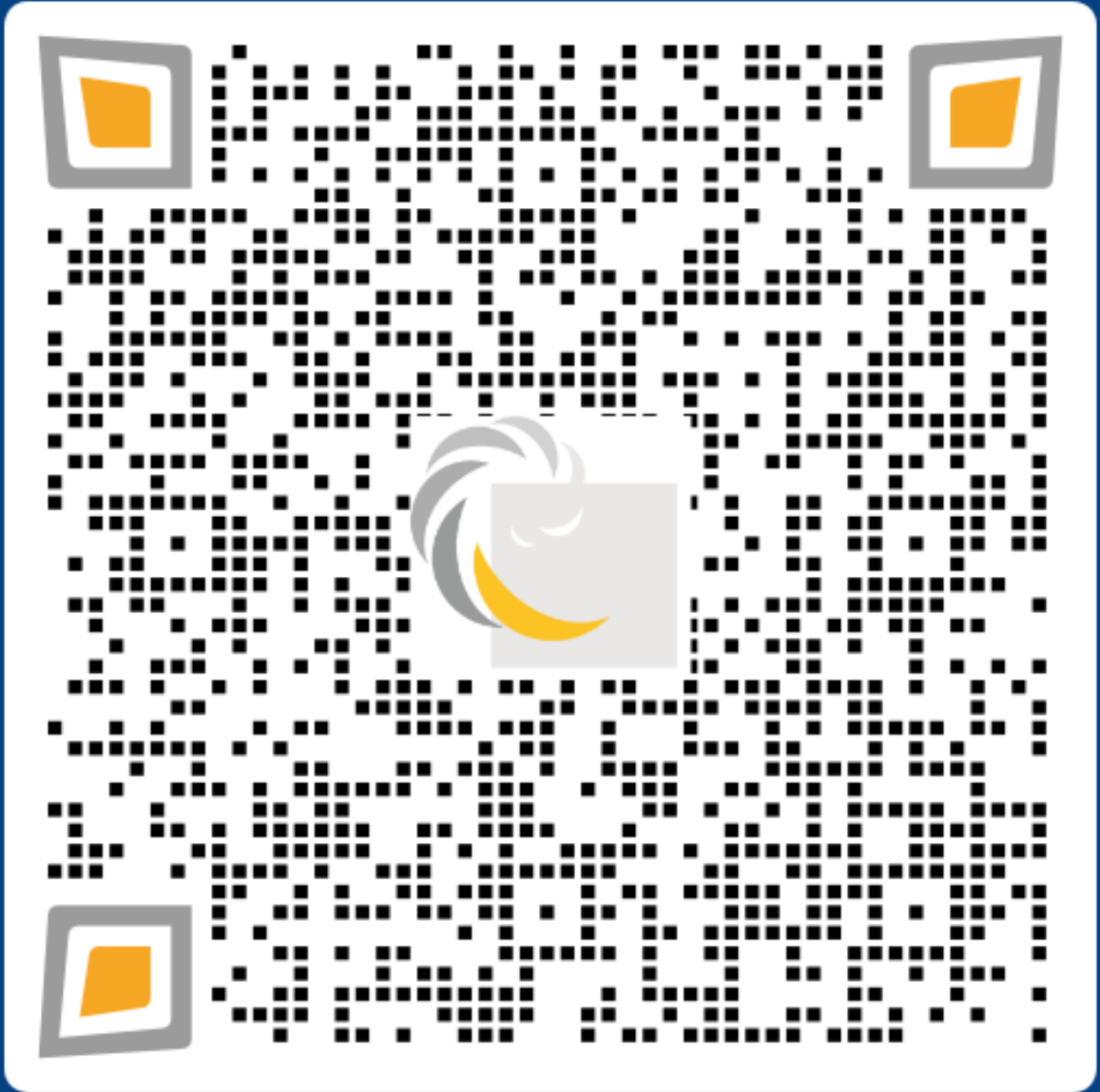
Diseases Causing lymph node enlargement irrespective of levels or regions:

- Lymphomas
- Viral infections of all sorts (CMV=cytomegalovirus, EBV= Epstein-Bar virus, HIV)
- Toxoplasmosis
- Melanoma malignum

WATCH THE PRACTICAL VIDEO OF THE NECK EXAMINATION.

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SCAN ME

CLINICAL ILLUSTRATIONS:



Fig. 6.3. Left-sided cervical lump in Level V/B.

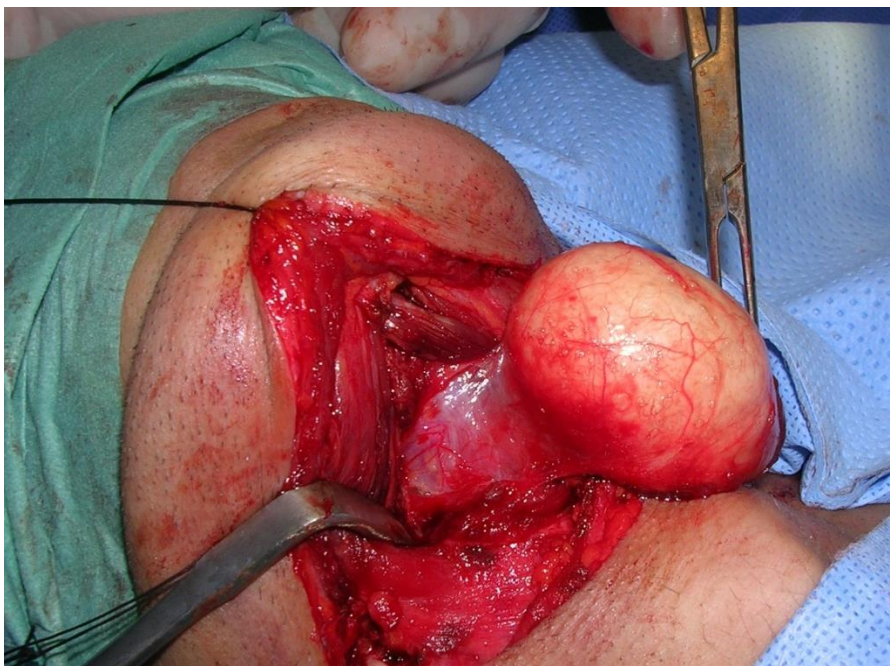


Fig. 6.4. Mid-line dermoid cyst in level VI.

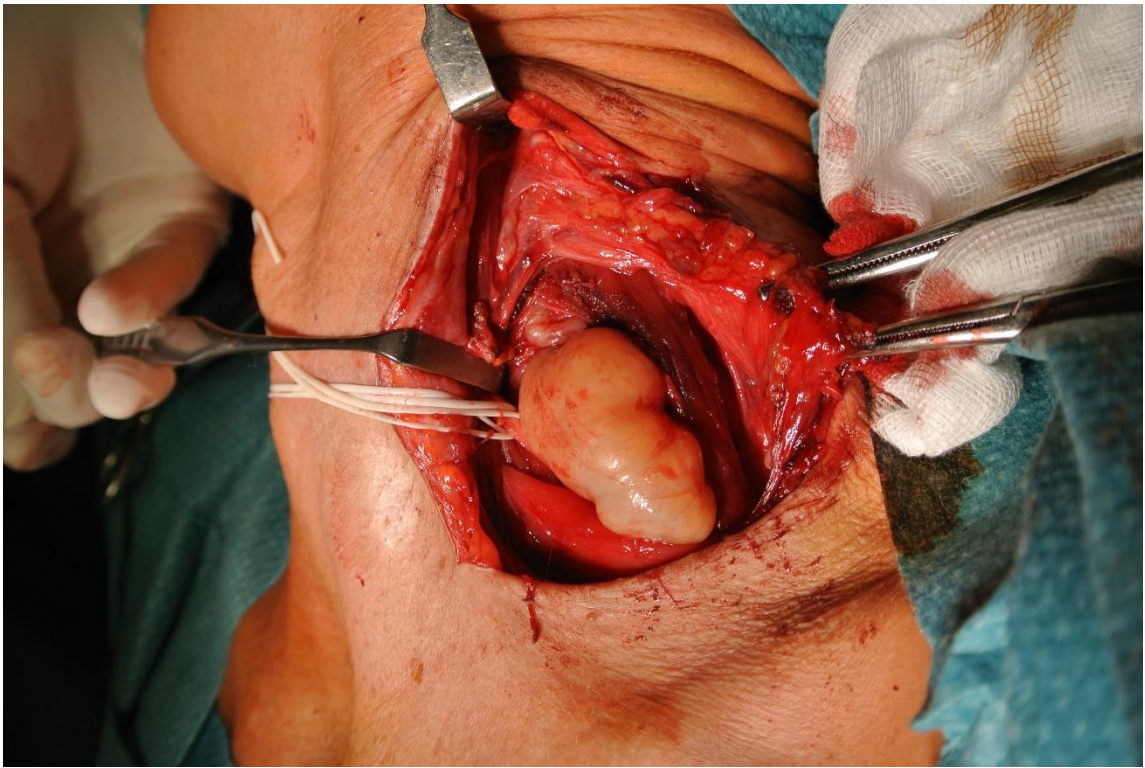


Fig. 6.5. Cervical spinal benign neurinoma arising from a nerve root.



Fig. 6.6. Multiple neck masses on the face and neck. Right-sided parotid mass, submandibular mass and a lump in Level III.



Fig. 6.7. Thyroid cancer displacing the trachea to the left.



Fig. 6.8. Inflamed and partially necrotized skin around tracheostomy.



Fig. 6.9. Surgical neck scars and a "Virchow's node".



Fig. 6.10. A "U-shaped" surgical scar and a tracheostomy opening after total laryngectomy.

CHAPTER VII. FEEDING BY NASOGASTRIC TUBE AND VIA PERCUTANEOUS ENDOSCOPIC GASTROSTOMY

NUTRITION OF PATIENTS

Indications for a Feeding tube or PEG insertion

I. Long-term feeding needs

- Head and neck cancers
- Acute stroke
- Severe trauma (e.g. maxillo-facial trauma, abdominal trauma)
- Neurologic diseases (e.g. coma)
- Developmental problems in children (Crohn's disease betegség, cystic fibrosis)
- Disorders resulting in hypercatabolic states (e.g. severe burn injuries, Crohn's disease, toxic epidermal necrolysis)

II. DECOMPRESSION

- Diabetic gastroparesis, Intestinal pseudo-obstruction
- Mechanical abdominal obstruction(e.g. by tumours or surgery)

III. Miscellaneous

- Gastric volvulus/fixation of the stomach
- Creating a biliogastric shunt
- Delivery of pharmacotherapy agents
- Unique surgical access route via PEG to the gastrointestinal tract

TYPES OF ARTIFICIAL FEEDING

Enteral (into the gut) ↔ **Parenteral** (via a central vein)

Enteral feeding types:

I. Per oral

(Supplementary nutritional diet)

II. Tube feeding

1. **Naso-gastric tube feeding (NGT)** (nasoduodenal-, nasojejunal tube feeding)
2. Oro-gastric-, oroduodenal-, orojejunal tube feeding (rarely used)
3. Pharyngo-gastric tube feeding (seldom used)

III. Stomas

1. Pharyngostoma
2. Oesophagostoma
3. Gastrostomas
 - Open surgical gastrostomy (Stamm)
 - **Percutaneous endoscopic gastrostomy (PEG)**
 - Percutaneous X-ray guided
 - Percutaneous ultrasound-guided
 - Percutaneous CT or MRI guided
 - Laparoscopic
4. Jejunostomas
 - Surgical
 - Extension of NGT to the jejunum
 - Laparoscopic
 - Percutaneous endoscopic
 - Needle catheter

NASO-GASTRIC TUBE (NGT)

Insertion of the nasogastric tube:

Nasogastric tube (Fig. 7.1.):

- Silastic made.
- Bigger the diameter, the more comfortable to use for feeding.
- The coloured longitudinal line on the tube has radiopacity, serves for X-ray visualization
- Horizontal coloured lines on the tube are also radiopaque.
 - The single line marks 45 cm length.
 - Double line: **55 cm**
(tube should be inserted til double line reaches nasal entrance!).
 - Triple line: 65 cm marking.
- Insert tube without local anaesthesia or spray lidocaine to anaesthetize only the affected side.

- The end of NGT is lubricated by, e.g. lidocaine jelly and pushed through the nose and into the pharynx via the wider nasal fossa.
- The patient head is tilted forward, and the patient is asked to swallow to make sure to avoid the trachea and larynx. Do not advance the tube when the patient breathes. Coughing, choking can be the signs of misplacement to the trachea.
- Advance tube until the double horizontal line reaches the nasal entrance.
- Control the correct position of the feeding tube.
 - Blow air into the tube via a feeding syringe (100-200ml) and listen through a phonendoscope over the patient's stomach. If the air is heard bubbling into the stomach with a stethoscope, then the tube is in the correct position.
 - Use plain X-ray to reassure correct positioning.
 - Aspirate some fluid from the tube with a syringe and determine the acidity of the liquid. If the pH is 5.5 or below, then the line is in the correct position.
- Fix the tube to the nose with tape (Fig. 7.2.).
- The ideal position of the feeding tube is above the cardia and not through it since it can cause reflux. Pull line slightly back in the case of "heartburn" or other signs of GERD.
- Feed the patient via NGT maximum for 4 to 6 weeks only. Use PEG in case of long term feeding needs.

PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG).

Insertion of the PEG:

- Standard oesophago-gastro-duodenoscopy(OGD) is performed.
- Insufflate the stomach with air to approximate stomach wall to the inner surface of the abdominal wall.
- Transilluminate abdominal wall inside to see the light of the endoscope via the skin or finger push the abdominal wall externally to visualize the indentation by the gastroscopist. These manoeuvres ensure no trapping of organs in between(Fig. 7.3). (Fig. 7.3.) Transillumination and finger indentation.

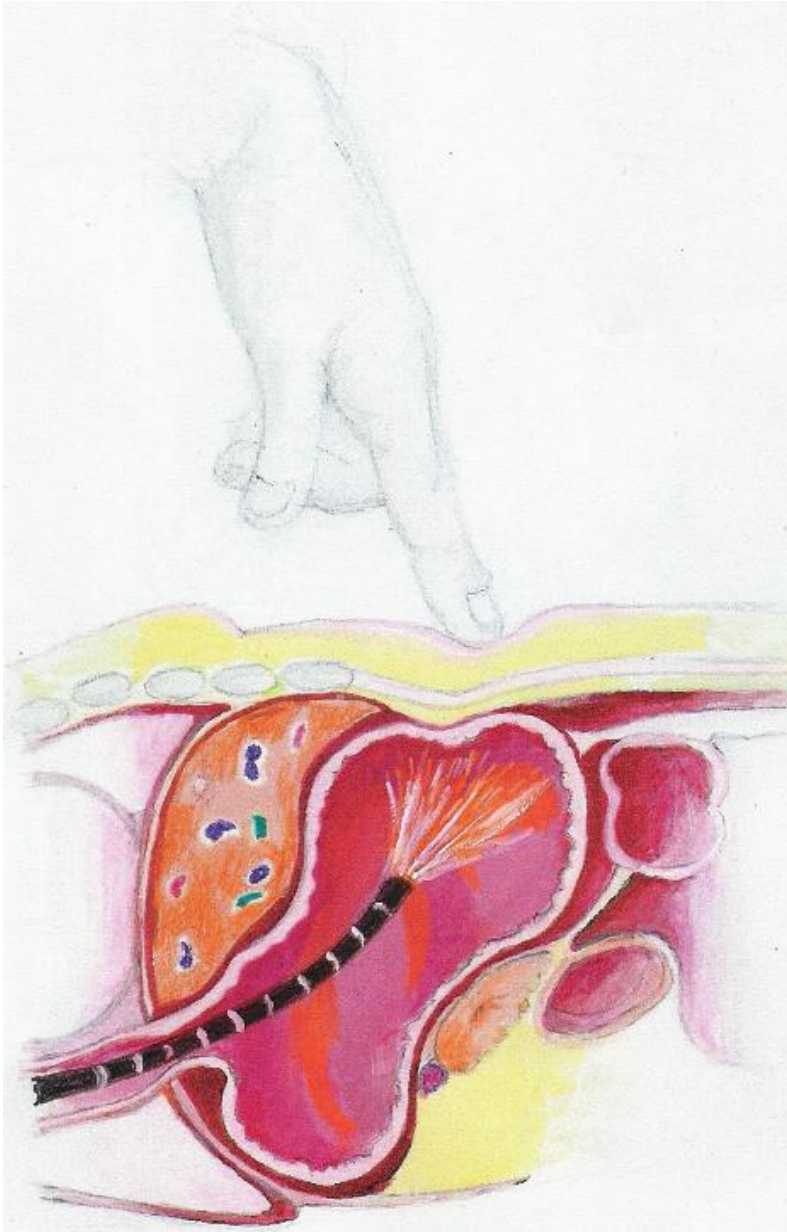


Fig. 7.3.

- Mark the optimal site of the insertion (Fig. 7.4.) which is in the middle third of the line connecting the umbilicus to the left rib cage.

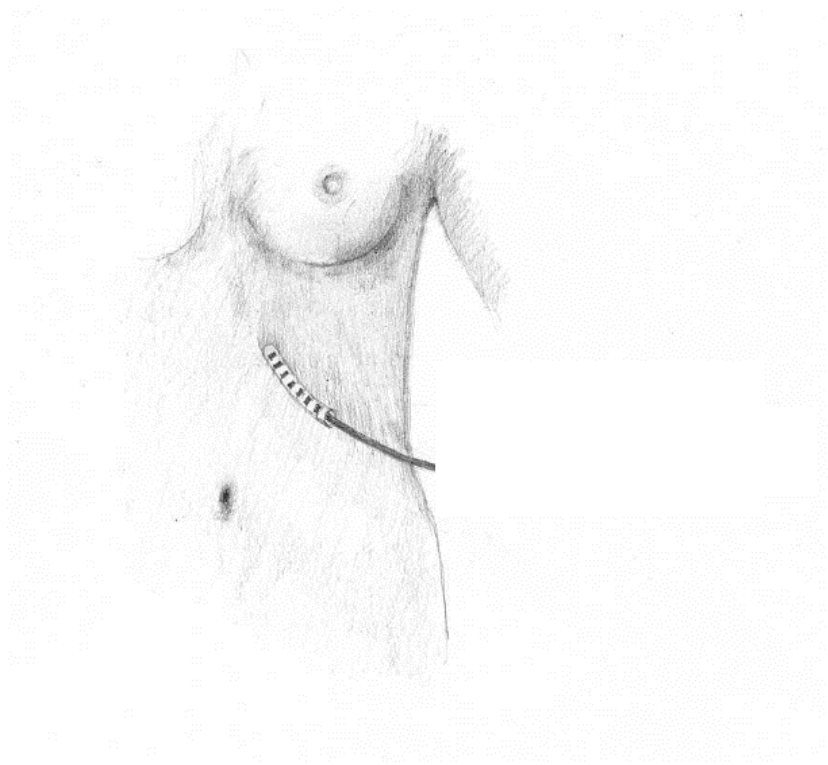


Fig. 7.4. The preferred site of PEG.

- Use local anaesthetics to infiltrate the skin at the site of the puncture.
- Push the special needle through the skin into the stomach and lead a thread into the stomach. The endoscopist should grab the line with, e.g. Dormia's basket (Fig. 7.5.).

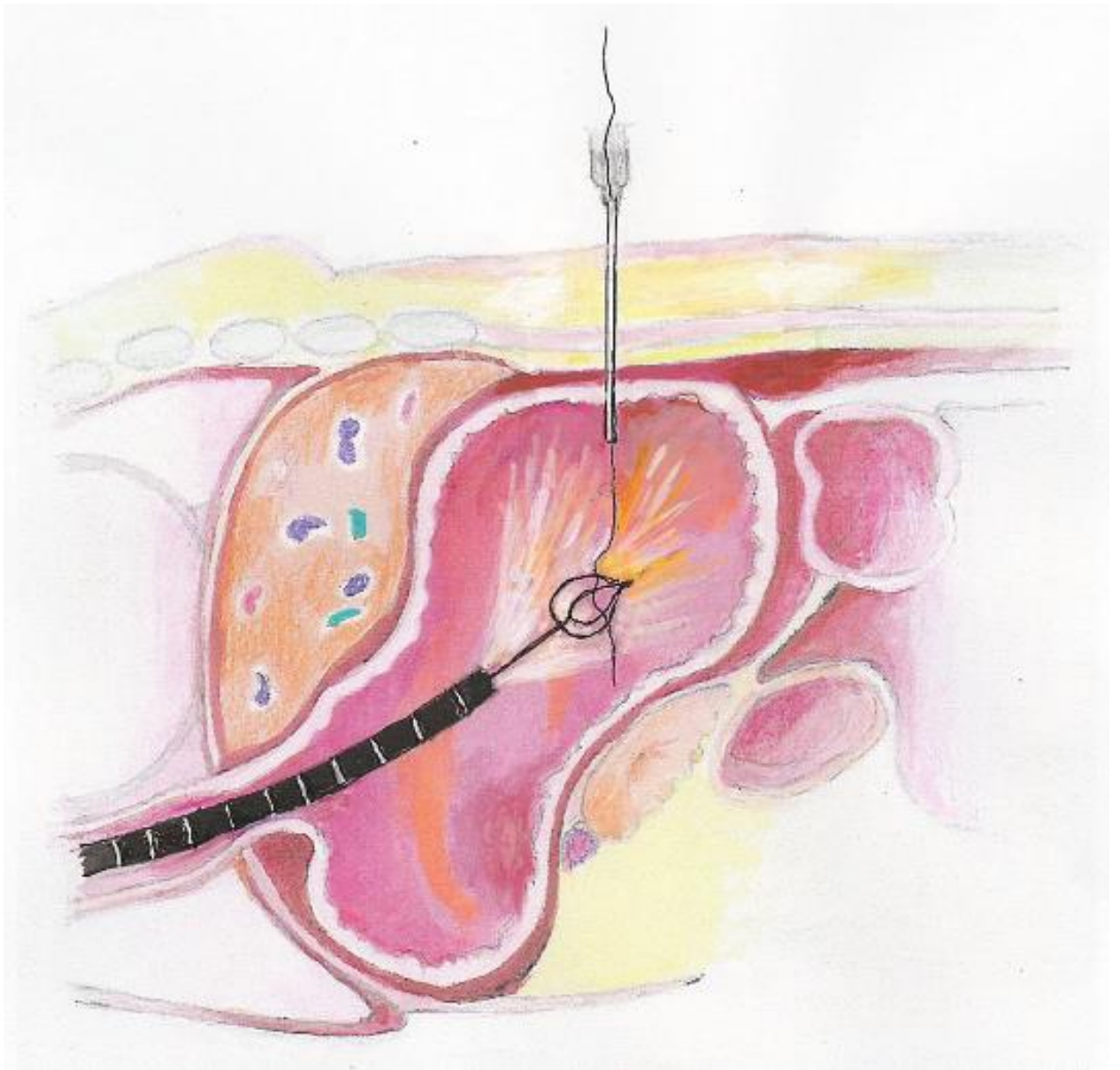


Fig. 7.5.

- The thread is pulled back through the mouse of the patient, and the feeding tube is secured to this end (Fig. 7.6.).

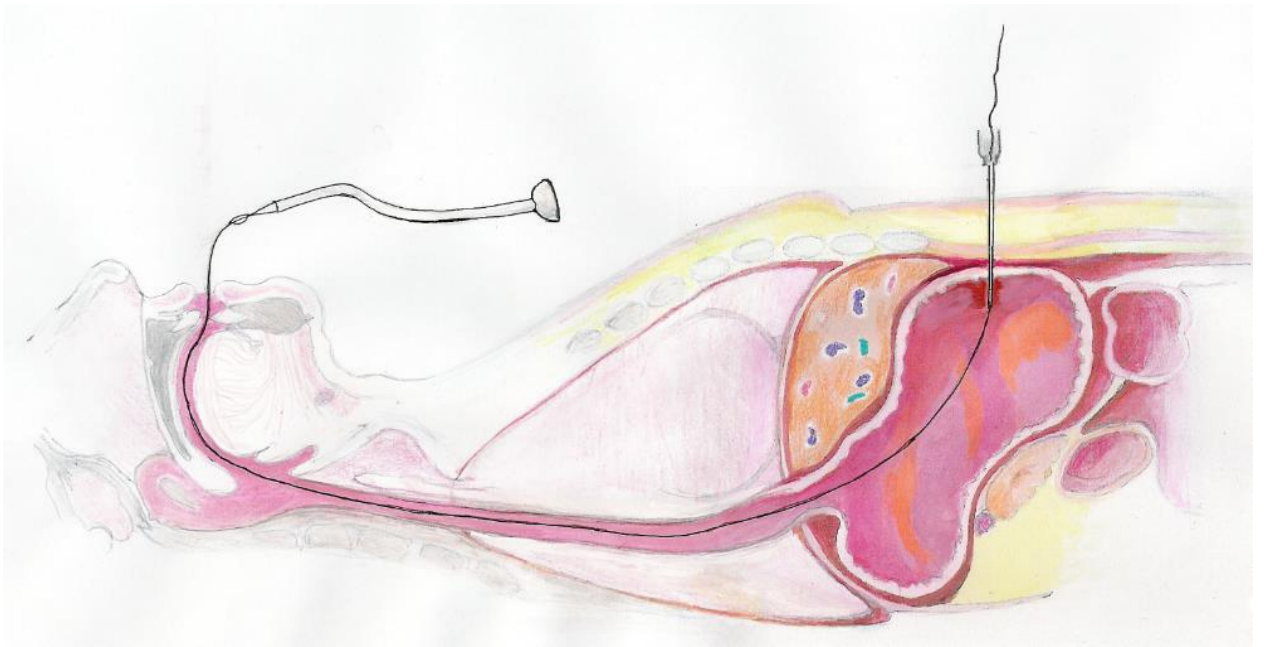


Fig. 7.6.

- Next, pull the tube through the oral cavity and the oesophagus into the stomach with the tread at the abdominal wall until the inner bumper reaches the wall and stops. Fix an outside bumper to the tube to hold it secure (Fig. 7.7.).

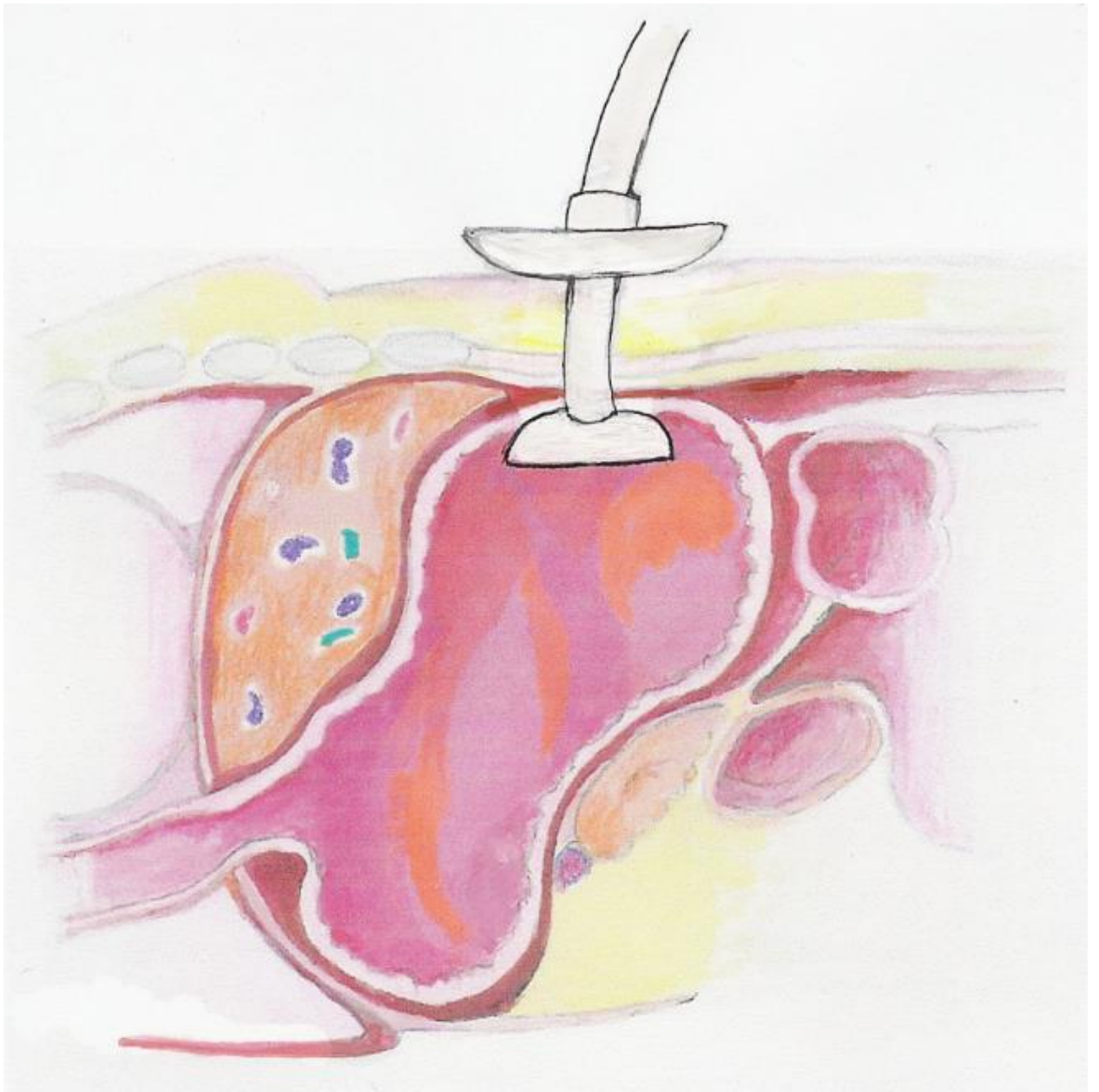


Fig. 7.7.

- Next, do a second-look endoscopy for control (Fig. 7.8.)

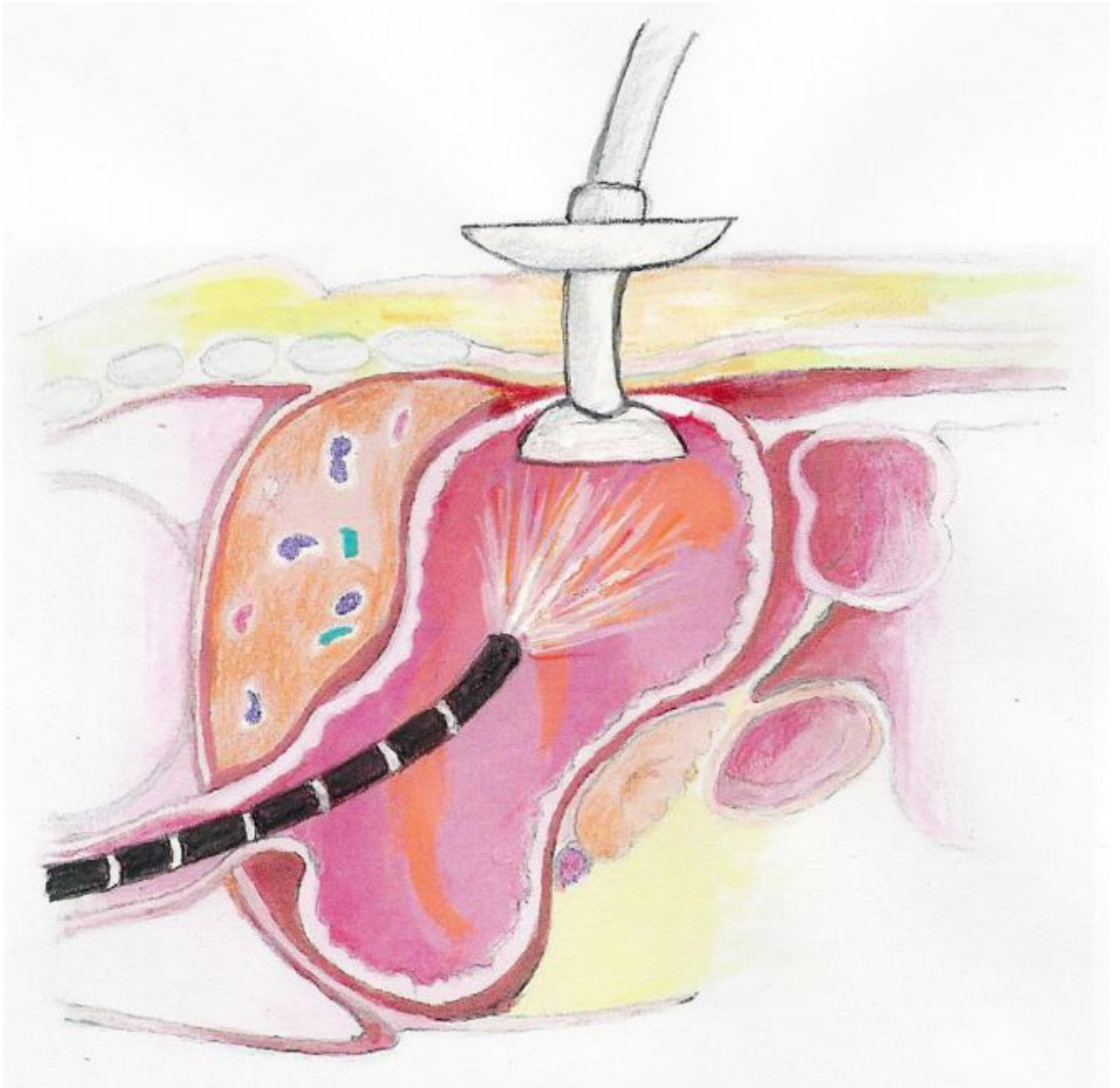


Fig. 7.8. The "second-look" endoscopy.

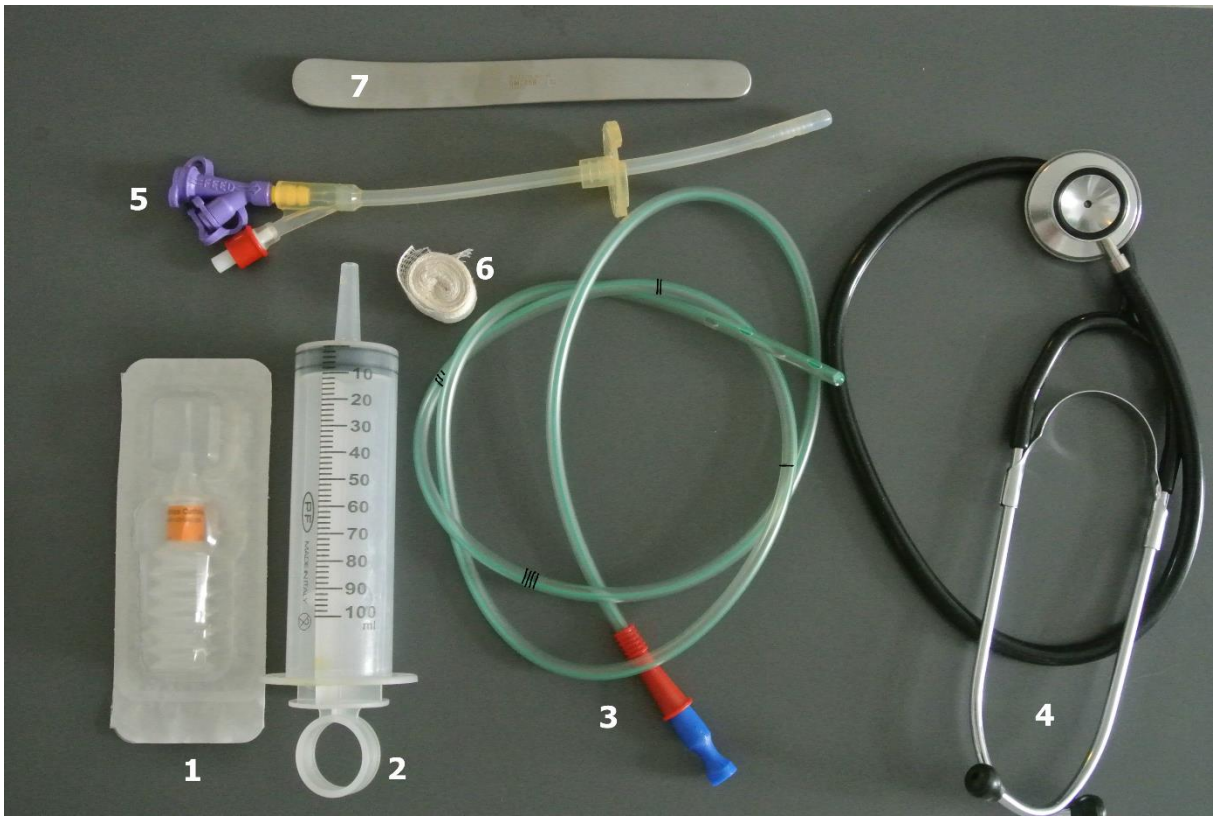


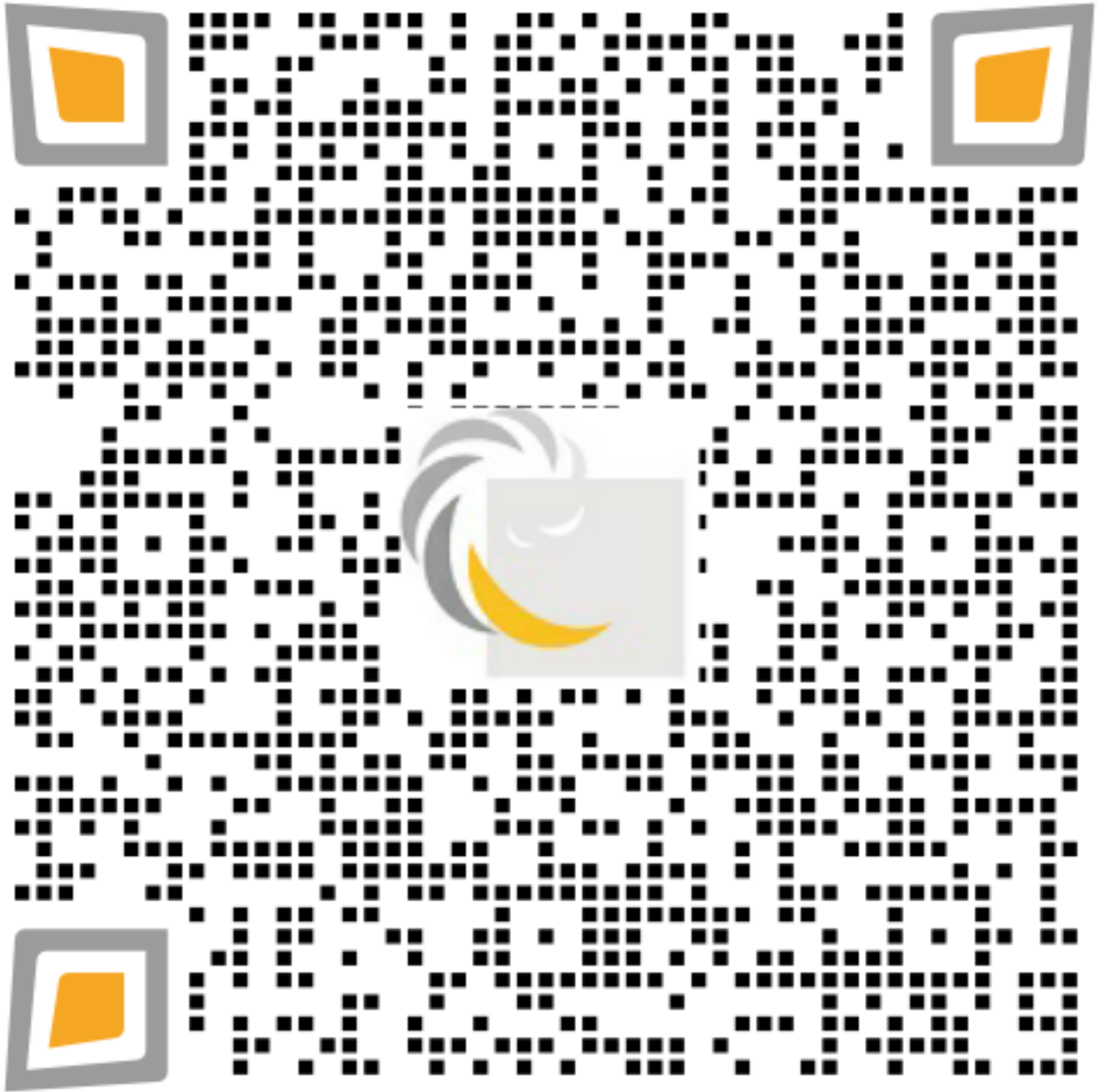
Fig. 7.9. Instruments needed for enteral feeding.

1. Lubricant jelly with chlorhexidine and lidocaine
2. Feeding syringe 100mL
3. NG tube
4. Phonendoscope
5. PEG tube
6. Gauze strip
7. Tongue depressor

WATCH THE PRACTICAL VIDEO OF THE NASOGASTRIC TUBE INSERTION AND PEG.

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Aetiology of nose bleeds	
Local causes	Systemic causes
<p>Nasal trauma</p> <ul style="list-style-type: none"> • facial bone fracture • nasal bone fracture • foreign body <p>Iatrogenic</p> <ul style="list-style-type: none"> • nose picking • nasal surgery <p>Dryness of nasal mucosa</p> <ul style="list-style-type: none"> • dry air <p>Nasal septal perforation</p> <p>Chemical irritation</p> <ul style="list-style-type: none"> • cocaine • ammonia • overuse of nasal drops <p>Tumours</p> <ul style="list-style-type: none"> • <i>benign</i> : polyps, inverted papilloma, angiofibroma, haemangioma • <i>malignant</i>: planocellular carcinoma, esthesioneuroblastoma <p>Inflammations allergic rhinitis bacterial, viral, fungal ARS-acute rhinosinusitis CRS-chronic rhinosinusitis</p> <p>Idiopathic</p>	<p>Coagulopathies</p> <ul style="list-style-type: none"> • <i>medications</i>: anticoagulants (15%), NSAID • haemophilia • von Willebrand's disease • malignant hematologic diseases • Hepatic problems • uraemia <p>cardio-vascular</p> <ul style="list-style-type: none"> • hypertension (33%) • arteriosclerosis • diabetes mellitus • Hereditary: Osler-Weber-Rendu (HHT-hereditary haemorrhagic telangiectasia) <p>Immune diseases Wegener's granuloma</p> <ul style="list-style-type: none"> • SLE (Systemic lupus erythematosus)

Fig. 8.1. Aetiology of nose bleeds

Treatment of nose bleeds:

1. First Aid.

- ABC's: Airway, Breathing, Circulation
- Lean head forward → Minimizes swallowed blood.
- Firm press and block nasal alae for 10 minutes as 90% of nose bleeds arise from Kiesselbach's area.

2. Access blood loss.

- Measure the pulse rate, blood pressure, watch for signs of shock—document results.

3. Determine the side and site of bleeding.

- Examine nasal cavities
- Move the patient's head forward and backwards and check bleeding in the back of the patient's throat.

4. Control the bleeding locally.

5. Treat the aetiology of the bleeding.



Fig.8.2. Instruments and devices to treat nose bleeds

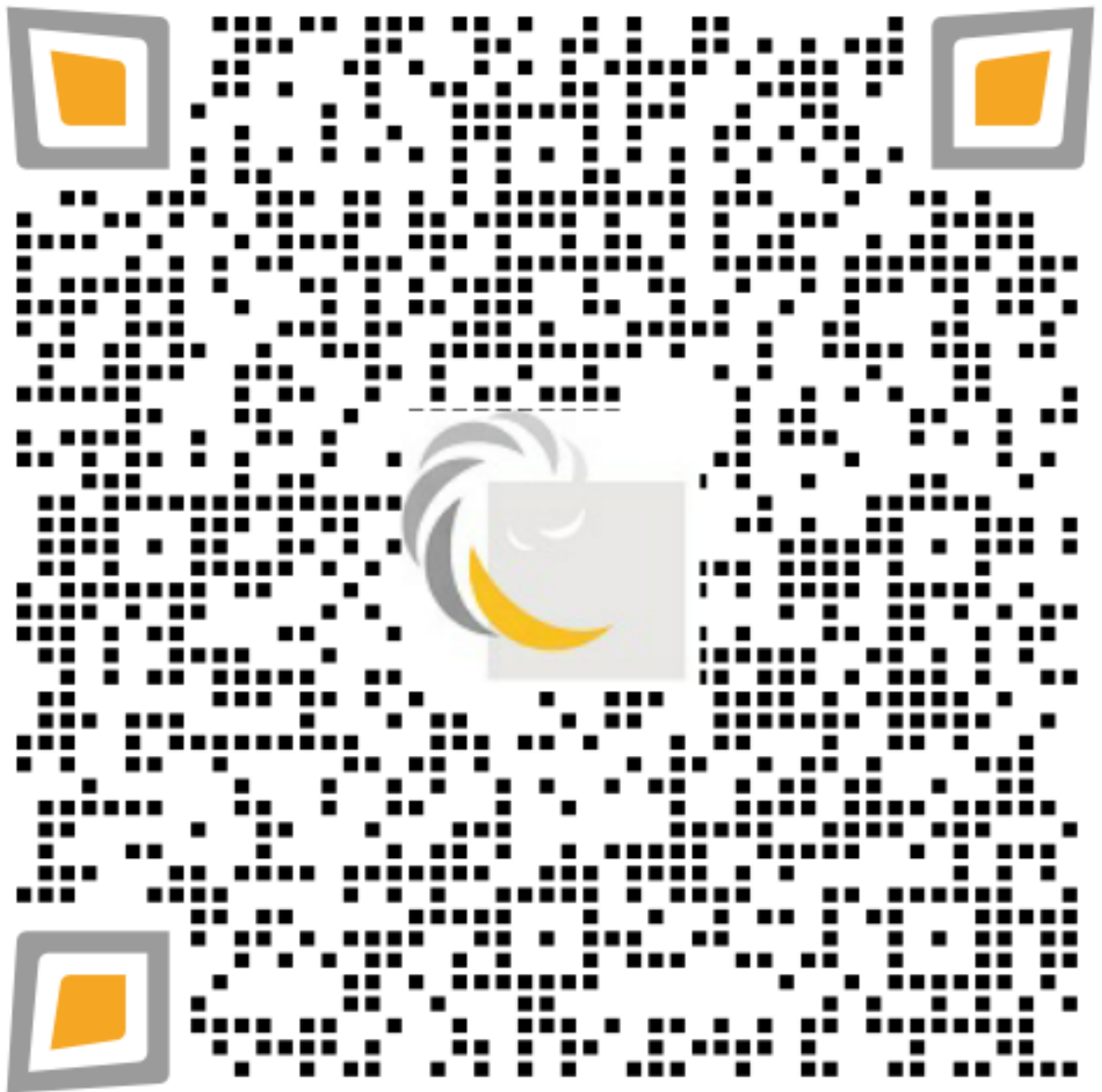
1. Iodoform gauze with Mikulitz cream
2. Hartmann's nasal speculum
3. Bipolar forceps

4. Belloq's nasal pack
5. Foley's catheter
6. Metal tongue depressor
7. Thiemann's catheter
8. Frazier's suction
9. Unguentum Argenti nitric (Mikulitz cream containing silver nitrate)
10. Unguentum nasale (nasal cream)
11. Rapid Rhino™ nasal pack
12. Acidum Trichloroaceticum (50% solution of trichloroacetic acid)
13. Inflatable nasal pack
14. Iodoform gauze strips
15. Piece of cotton wool for topical anaesthetic solution
16. Cotton wool carrier
17. Bajonette nasal forceps
18. Nasal dressing

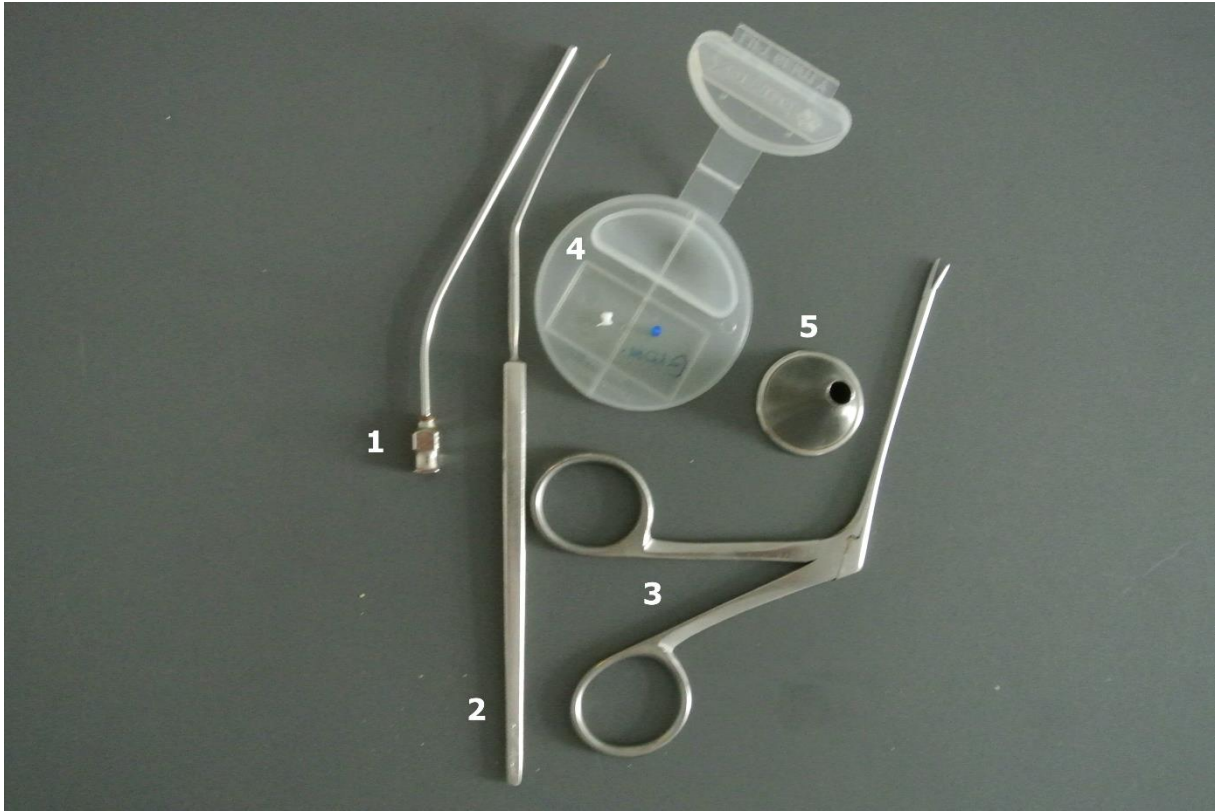
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Indication for myringotomy:



→ Acute suppurative otitis media.

Indication os grommet insertion:

→ chronic otitis media with effusion.

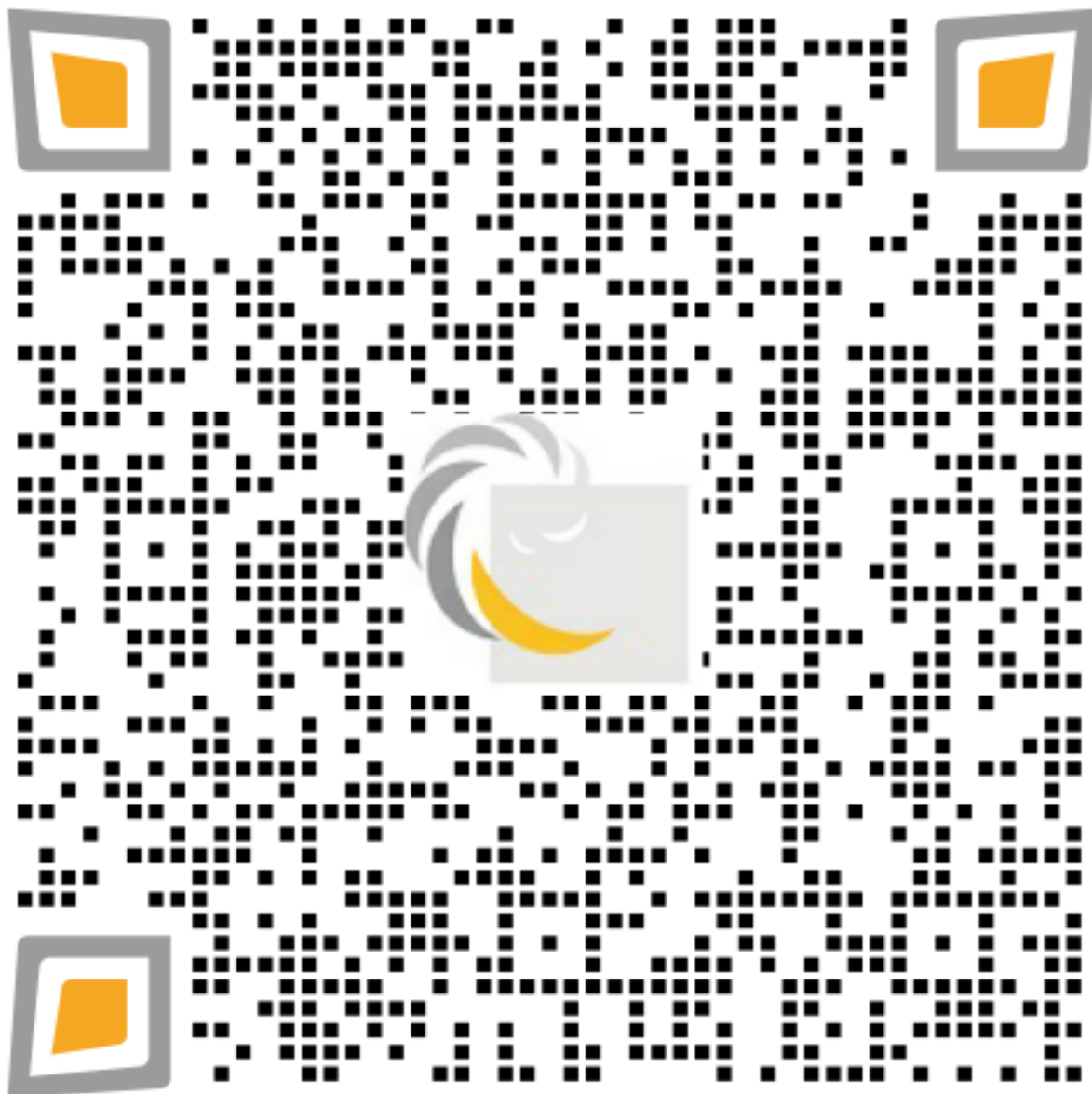
Fig. 9.1. Instruments for myringotomy and grommet insertion.

1. Rosen suction
2. Politzer's myringotomy blade
3. Hartmann's ear forceps ("Crokodile" forceps)
4. Ventilation tube (grommet) Shah's type (white) and Donaldson's (blue) "permanent" type
5. Ear funnel

WATCH THE PRACTICAL VIDEO OF MYRINGOTOMY AND GROMMET INSERTION.

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Instruments used for removal:

- **Ear forceps** (bayonette shape)
- **Crocodile forceps** (micro-ear forceps)
- **Jansen's hook** (needle with rectangular, but blunt end)
- **Feeding syringe**
- **Electric suction device**

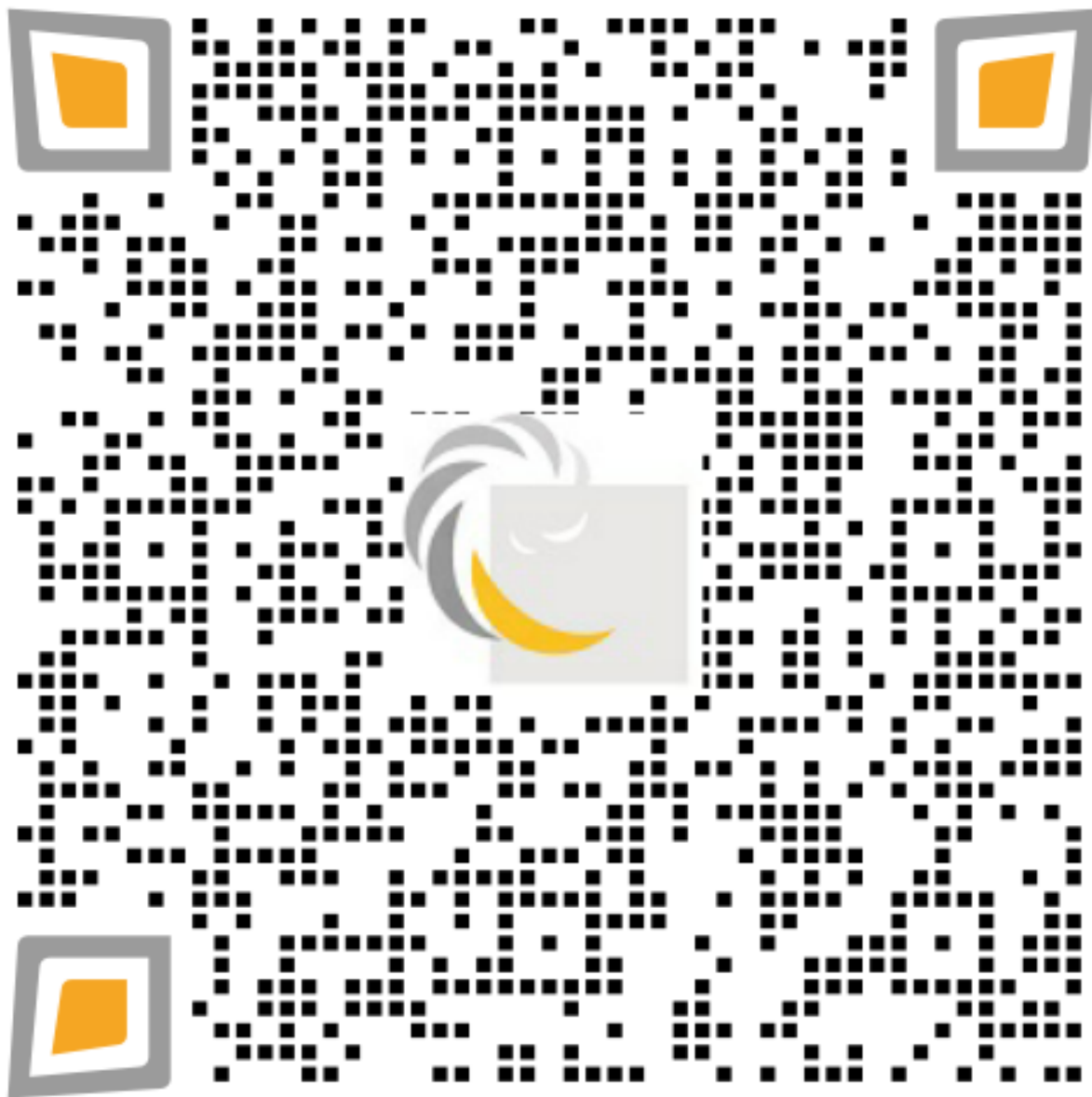
The method of removal depends on the type of foreign body and its location.

A round foreign body should not be attempted to be removed with forceps, as the round foreign body is likely to spring out of the jaws of the forceps and end up more profound in the meatus.

WATCH THE PRACTICAL VIDEO OF THE FOREIGN BODY REMOVAL FROM EARS.

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