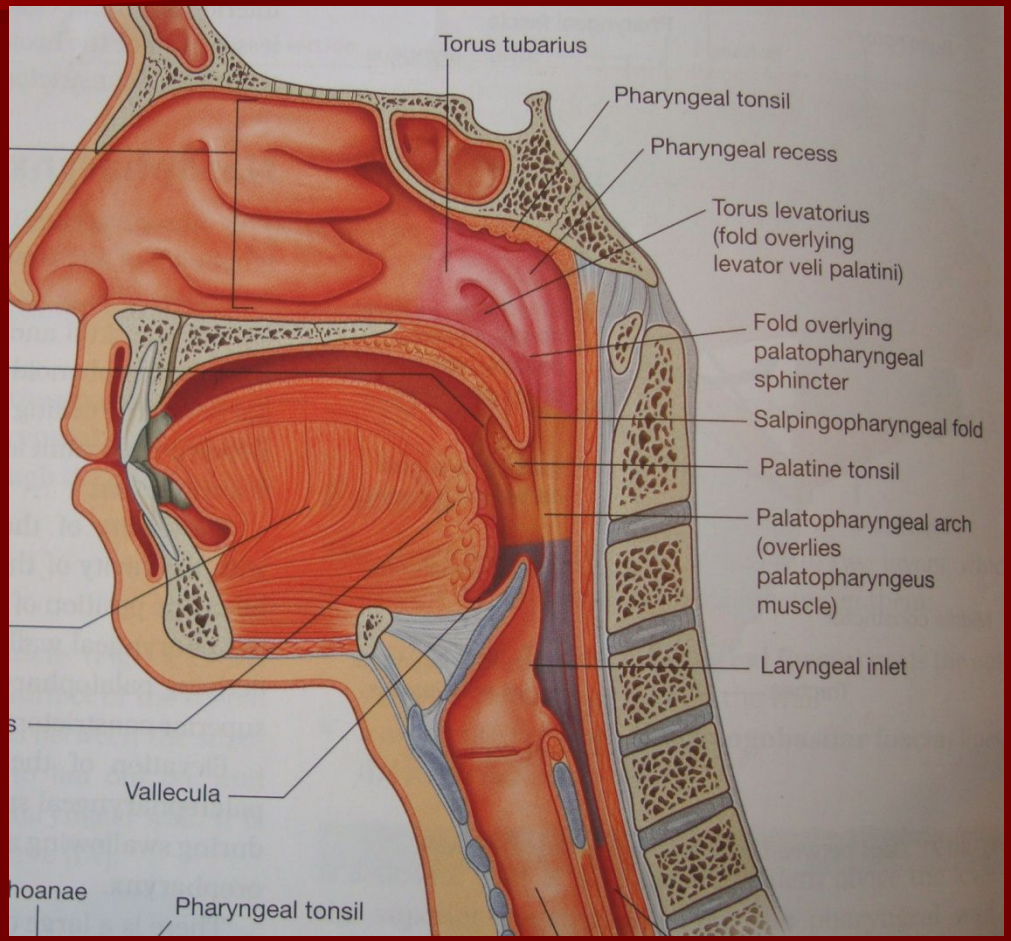
Clinical anatomy, physiology and methods of examination of the larynx. Acute and chronic laryngitis. Versions of the local forms of the chronic laryngitis (hyperkeratosis, pachydermia, leukoplakia). Acute and chronic stenosis of the larynx. Infection granulomas of the upper respiratory tract. Tumors of the larynx.

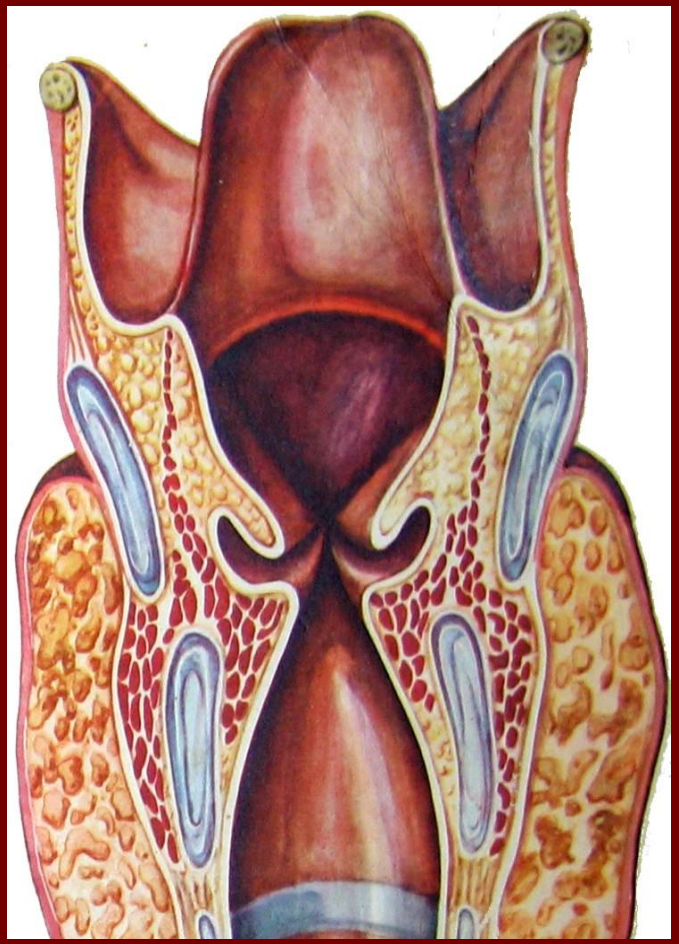
Head of Otolaryngology Department, professor V.I. Troyan

Larynx being a part of the air conducting tracts of the organism, participates in fulfilling the main functions of breathing, phonation and speech. The violation of the normal anatomical and functional relationships in the larynx leads to different pathological processes, firstly discovered by the development of the nose, larynx and voice dysfunction. The knowledge of topological peculiarities of the larynx is necessary for studying of these organ diseases and working out the methods of treatment. Acute and chronic larynx diseases running with the disturbance of breathing and vocal functions, are often met in the clinical practice.

ANATOMY OF LARYNX

The larynx lies in front of the hypopharynx opposite the third to sixth cervical vertebrae. It moves vertically and in anteroposterior direction during swallowing and phonation.





There are 3 unpaired and 3 paired cartilages.

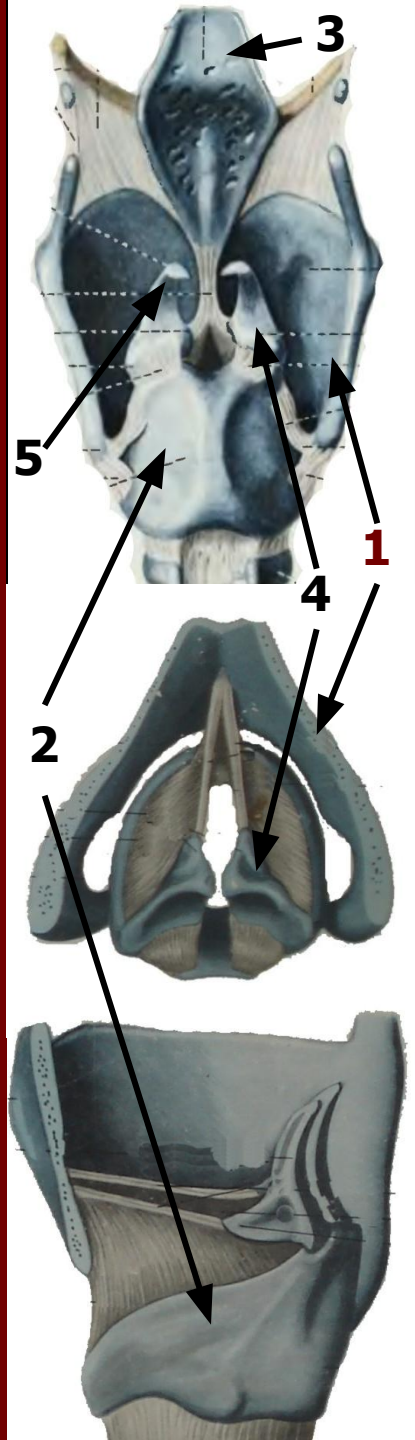
1. **Thyroid.** It is the largest of all the cartilages.

2. **Cricoid.** It is the only cartilage forming a complete ring. Its posterior part is expanded to form a lamina while anteriorly it is narrow forming an arch.

3. **Epiglottis.** It is a leaf-like yellow elastic cartilage forming anterior wall of laryngeal inlet.

4. **Arytenoid cartilages.** They are paired. Each arytenoid cartilage is pyramidal in shape. It has a *base* which articulates with cricoid cartilage; a *muscular process,* directed laterally to give attachment to intrinsic laryngeal muscles; a *vocal process* directed anteriorly giving attachment to vocal cord; and an *apex* which supports the corniculate cartilage.

5. **Corniculate cartilage** (of Santorini).They are also paired. Each articulates with the apex of arytenoid cartilage.

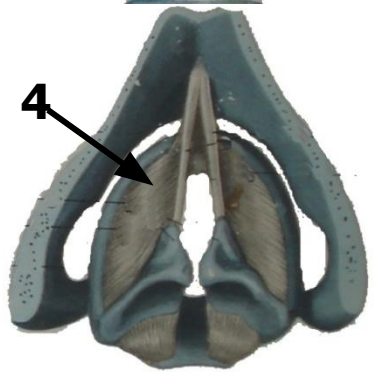


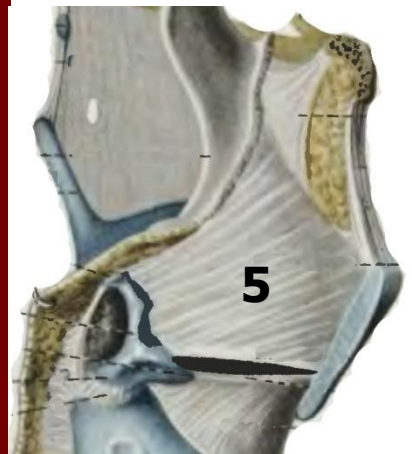
Extrinsic laryngeal membranes:

1. Thyrohyoid membrane. Connects thyroid cartilage to hyoid bone.
2. Cricothyroid membrane. Connects thyroid cartilage to cricoid cartilage.
3. Cricotracheal membrane. Connects cricoid cartilage to the first trachea ring.

Intrinsic laryngeal membranes:

4. Cricovocal membrane. It is a triangular fibroelastic membrane. Its upper border is free and stretches between middle of thyroid angle to the vocal process of arytenoid and forms the vocal ligament. Its lower border attaches to the arch of cricoid cartilage. From its lower attachment the membrane proceeds upwards and medially and thus, with its fellow of opposite side, forms conus elasticus.
5. Quadrangular membrane. It lies deep to mucosa of aryepiglottic folds and is not well defined. It stretches between the epiglottic and arytenoid cartilages. Its lower border forms the vestibular ligament which lies in the false cord.





They are of two types muscles, namely intrinsic, which attach laryngeal cartilages to each other, and extrinsic, which attach larynx to the surrounding structures.

Intrinsic muscles.

Acting on vocal cords

Abductors:

1. Posterior cricoarytenoid

Adductors:

2. Lateral cricoarytenoid
3. Transverse arytenoid
4. Oblique arytenoid

Tensors:

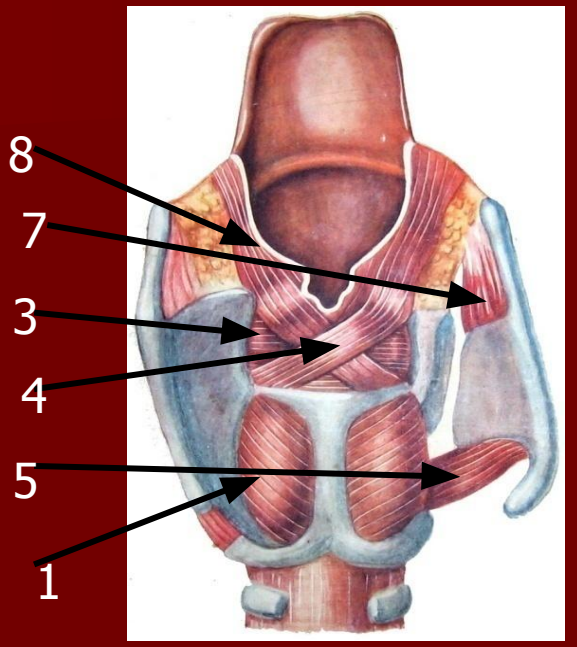
5. Cricothyroid
6. Vocalis

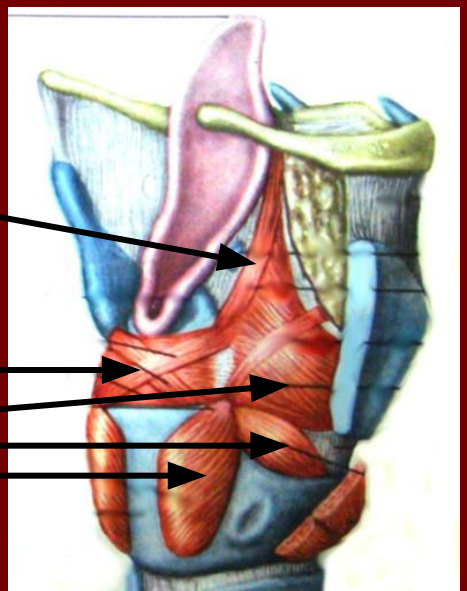
Acting on laryngeal inlet:

7. Thyroepiglottic
8. Aryepiglottic

Extrinsic muscles.

Sternohyoid, sternothyroid and thyrohyoid.

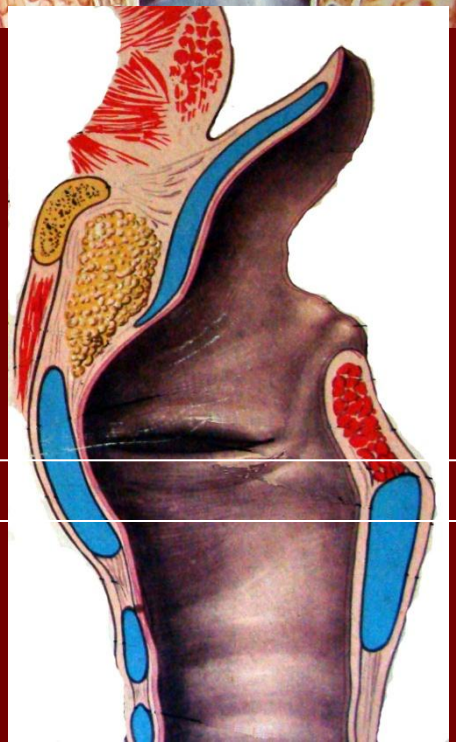




Laryngeal cavity starts at the laryngeal inlet where it communicates with the pharynx and ends at the lower border of cricoid cartilage where it is continuous with the lumen of trachea. Two pairs of folds - vestibular and vocal - divide the cavity into three parts, namely the vestibule(1), the glottic(2) and the subglottic space(3).

Vestibule extends from laryngeal inlet to vestibular folds (false vocal cords). The saccule is a diverticulum of mucous membrane.

Subglottic space (infraglottic larynx) extends from vocal cords to lower border of cricoid cartilage.



Vocal folds (true vocal cords). They are two pearly-white sharp bands extending from thyroid angle to the vocal processes of arytenoids.

Glottis (rima glottidis). It is the elongated space between vocal cords anteriorly and vocal processes and base of arytenoids posteriorly. Antero-posteriroly it is about 24 mm in men and 16 mm in women.

Supra glottic larynx above the vocal cords is drained by lymphatics which pierce the thyrohyoid membrane and go to upper deep cervical. Infraglottic larynx below the vocal cords is drained by lymphatics which pierce cricothyroid membrane and go to prelaryngeal and pretracheal nodes and thence to lower deep cervical and mediastinal nodes.

The larynx performs the following important functions:

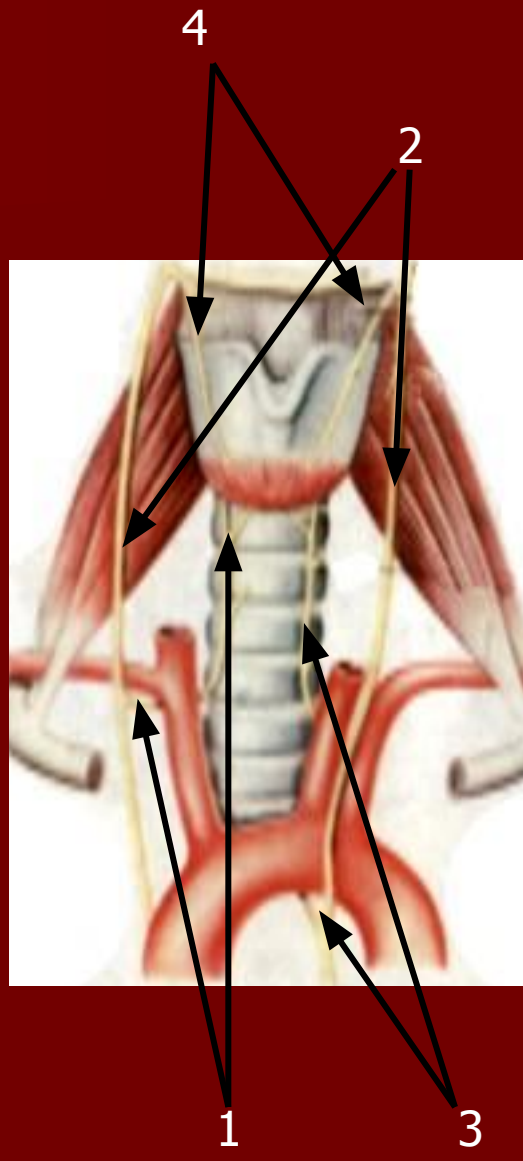
1. Protection of lower airways
2. Phonation
3. Respiration

Phylogenetically this is the earliest function to develop; voice production is secondary. The larynx protects the lower air passages in three different ways: sphincteric closure of laryngeal opening, cessation of respiration, cough reflex.

Larynx is like a wind instrument. Voice is produced by the following mechanism *(aerodynamic myoelastic theory of voice production):v*ocal cords are kept adducted, infraglottic air pressure is generated by the exhaled air from the lungs due to contraction of thoracic and abdominal muscles, the air forces open the cords and is released as small puffs which vibrate the vocal cords and produce sound which is amplified by mouth, pharynx, nose and chest. This sound is converted into speech by

Nerve supply of larynx

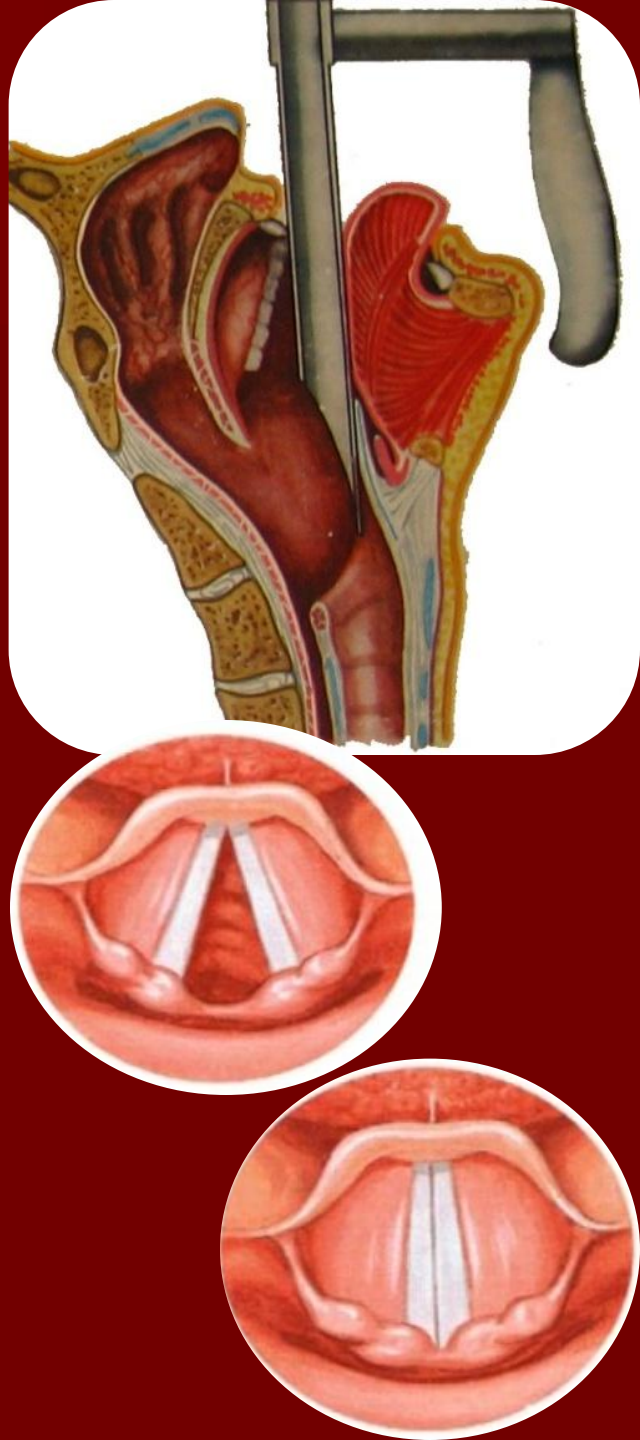
- **Motor.** All the muscles which move the vocal cord (abductors, adductors or tensors) are supplied by the recurrent laryngeal nerve except the cricothyroid muscle. Right recurrent laryngeal nerve(1) arises from the vagus(2) at the level of subclavian artery, hooks round it and then ascends between Ihe trachea and oesophagus. The left recurrent laryngeal nerve(3) arises from the vagus in the mediastinum at the level of arch of aorta, loops round it and then ascends into the neck in the tracheo-oesophageal groove. Thus, left recurrent laryngeal nerve has a much longer course which makes it more prone to paralysis compared to the right one.
- **Sensory.** Mucous is supplied by superior laryngeal nerve(4). It arises from inferior ganglion of the vagus. *Laryngeal* reflexogenic zones are mostly located on the laryngeal surface of the epiglottis, the true vocal folds, arytenoid cartilages and in the interarytenoid space and also in the rima vestibuli.



METHODS OF EXAMINATION

Laryngoscopy is visual inspection of the larynx interior. Direct and indirect laryngoscopy are distinguished.

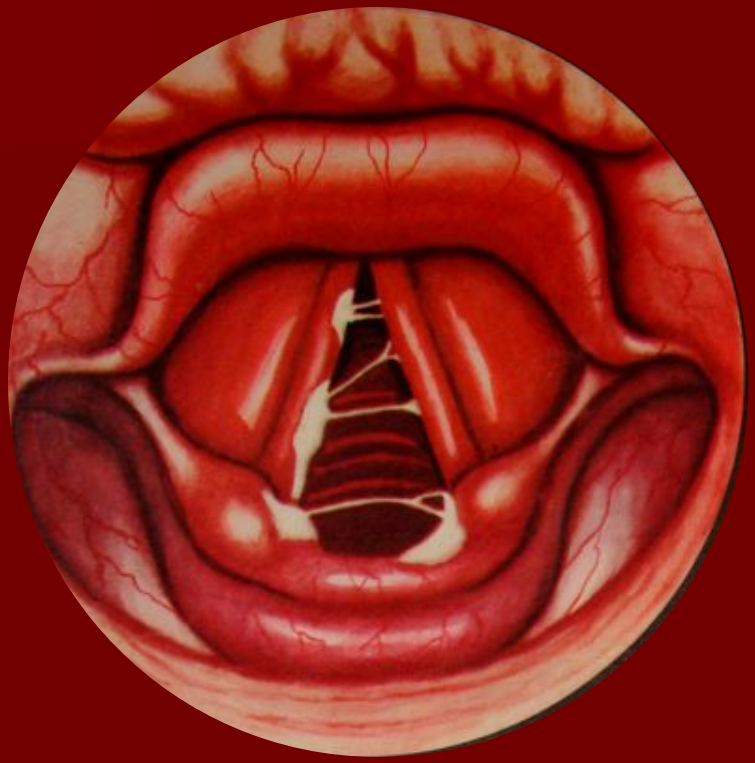
- Direct laryngoscopy is used in cases where inspection with a speculum is infeasible (in infants) or if inspection is not sufficiently informative. Direct laryngoscopy is also used when specimens of live tissue have to be taken (biopsy) for histological studies, or if a newgrowth should be removed. At the present time direct laryngoscopy precedes the intubation of the airways under anaesthesia and is the first step in tracheobronchoscopy. Direct laryngoscopy in



- **Indirect laryngoscopy** is carried out using a laryngeal speculum. The patient is asked to utter a long sound 'ah' and take a deep breath. During phonation, and then during inspiration the inner surfaces of the larynx become visible in two phases of the physiological activity.
- **Roentgenotomography** is an important paraclinical method of examination of the lary

Acute catarrhal laryngitis.

Acute inflammation of the laryngeal mucosa is usually extension of catarrhal inflammation of nasal and pharyngeal mucosa, e.g. In ОРВИ, influenza.



Symptoms. The disease is characterized by hoarse voice, tickling and dryness in the throat. The body temperature is usually normal and less frequently it rises to subfebrile.

Simultaneously with the subjective signs, develops also dry cough, which later turns into wet cough. Voice production disturbances are characterized by various degrees of dysphonia to complete aphonia. Respiration is sometimes difficult because of accumulation of mucopurulent crusts and swelling of the mucosa.

Treatment. The larynx should first of all be spared. The patient is not allowed to talk until acute inflammation subsides. Spicy or cold food, alcoholic drinks and smoking are prohibited. A warming compress should be applied to the neck. Medicamentous therapy is directed at eliminating inflammation in the larynx and preventing complications. In some cases it is recommended to add of лаферон, ереспал,биопарокс given by inhalation, but in all cases the patient's sensitivity to the drug should be tested.

Subglottic laryngitis (false croup) is a variety of acute catarrhal laryngitis which develops in the infraglottic space. It occurs in children ageing from 2 to 5 and is associated with the anatomy of their larynx (narrow lumen and loose connective tissue in the infraglottic space). The onset of the disease is as a rule connected with acute inflammation of the mucosa of the nose or the pharynx. False croup occurs mostly in children who tend to develop laryngospasm and suffer from diathesis.

The child wakes up and tosses in his bed. Breathing becomes very difficult and whistling; inspiratory dyspnoea is pronounced. The nails and the visible mucosa become cyanotic. The child is frightened and this intensifies coughing. Inspection of the child reveals retraction of the soft tissues of the jugular fossa, supra- and subclavicular spaces, and the epigastric region.

This condition lasts from a few minutes to half an hour; the child then sweats excessively and his respiration becomes almost normal.

The laryngoscopic picture in subglottic laryngitis is characterized by ridgelike swelling of hyperaemic mucosa in the infraglottic compartment.

Treatment includes common hygienic measures, ventilation in the room, and therapeutic measures. лаферон, ереспал,биопарокс преднизолон,димедрол,лазикс.

Phlegmonous laryngitis is a suppurative inflammation of the submucous layer, possibly of the muscles, tendons, and the laryngeal perichondrium. Its aetiological factor is infection (staphylococcus, streptococcus, etc.). The disease occurs mostly in males ageing from 20 to 35. The affection can be circumscribed and diffuse.The patient complains of severe pain on swallowing, especially if the phlegmona is located on the tongue surface of the epiglottis and the arytenoid cartilages. If the glottis tissues are affected, the first symptom is hoarse barking cough and respiratory distress (to asphyxia). The body temperature is high. Examination reveals inflammation of the regional lymph nodes.

Laryngoscopy reveals hyperaemic and infiltrated laryngeal mucosa with sites of necrosis. The formation of an abscess is characterized by circumscribed swelling; pus can be seen through the thinned mucosa. Mobility of some laryngeal structures is strongly restricted.

Treatment. The patient must be taken to hospital. Tracheostomy is indicated for increasing stenosis. General antibacterial and anti-inflammatory therapy is started at the early period of the disease (Амоксиклав, преднизолон,димедрол,лазикс). If an abscess is present, it should be opened surgically. If the phlegmona spreads onto the soft tissues of the neck, external incisions are made to ensure adequate drainage of suppurative cavities.

Chronic inflammatory diseases of the larynx is in the majority of cases secondary to acute inflammations. It may follow incompletely resolved acute simple laryngitis. Presence of chronic infection in paranasal sinuses, teeth and tonsils and chronic chest infections, occupational factors, e.g. exposure to dust, fumes and other chemical components, smoking, alcohol, vocal abuse are important contributory causes. Three forms of chronic inflammatory diseases of the larynx and the trachea are now distinguished: catarrhal, hyperplastic, and atrophic.

Chronic catarrhal laryngitis is in most cases secondary to acute laryngitis. The main aetiological role of this pathology in singers, actors, lecturers, etc. is the occupational overload on the vocal apparatus. Laryngoscopy reveals congestive hyperaemia of the laryngeal mucosa, which is more pronounced in the region of the vocal folds; blood vessels are often dilated.

Treatment is aimed at eliminating the aetiological factor. The patient must rest his voice. Local therapy includes instillation of an antibiotic solution containing hydrocortisone suspension (5 ml of isotonic sodium

Chronic hyperplastic laryngitis is characterized by hyperplasia of the laryngeal mucosa. Local and diffuse forms of the disease are distinguished by the extent of involvement. The main complaint of the patients is hoarseness and even aphonia, which are usually due to uneven thickening of the vocal folds and paresis of the vocal muscles. Direct and indirect laryngoscopy reveal hypertrophy of the mucosa which is usually symmetrical on both sides of the larynx and in the interarytenoid notch. This hyperplasia can however be malignant and the diagnosis of chronic hyperplastic laryngitis should be established not only by observing the clinical signs of the disease but also by the histologic and cytologic findings.

Treatment is, in the first instance, directed at removing the causative factors; talking must be prohibited. Exacerbations are treated like acute catarrhal laryngitis. If mucosal hyperplasia is significant, a 2-3 per cent silver solution (kollargol, protargol)is applied every other day during the course of 2 weeks.

Pachydermia laryngis is characterised by heaping up of epithelium in the interarytenoid region and vocal processes of aryttnoids. Exact aetiology is not known but disease mainly affects males who indulge in excessive smoking and alcohol. When changes are confined to the vocal processes, disease is termed as "contact pachydermia" or "contact ulcer". Hoarseness or huskiness of voice is the main presenting feature and is due to faulty approximation of cords.

Hawking, i.e. constant desire to clear the throat. This is because mucus keeps sticking in the interarytenoid region. Examination shows heaping up of epithelium in interarytenoid region which may extend to vocal processes and sometimes arytenoids. On phonation, it stands out like a "cock's comb". Biopsy is essential to exclude tuberculosis or carcinoma.

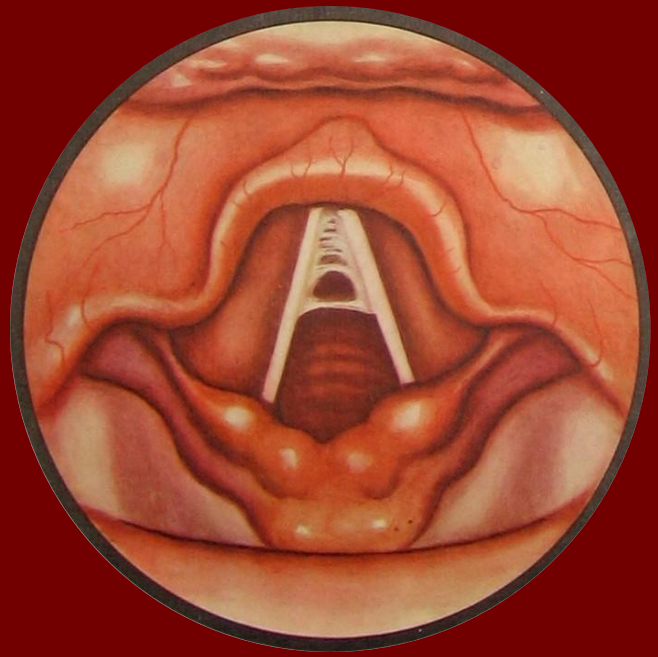
Leukoplakia or keratosis are also a localised form of epithelial hyperplasia involving upper surface of one or both vocal cords. It appears as a white plaque or a warty growth on the cord without affecting its mobility. It is regarded as a precancerous condition because "carcinoma in situ" frequently supervenes. Hoarseness is the common presenting symptom. Treatment is stripping of vocal cords and subjecting the tissues to histology for any malignant change.

Polypoid degeneration of vocal cords (Reinke's oedema). It is bilateral symmetrical swelling of the whole of membranous part of the vocal cords, most often seen in middle aged men and women. This is due to oedema of the subepithelial space (Reinke 's space) of the vocal cords. Hoarseness is the common symptom. Patient uses false cords for voice production and this gives him low-pitched and rough voice. Vocal

Ventricular bands may appear hyperaemic and hypertrophic and may hide view of the true cords.

Treatment: Decortication of the vocal cords, i.e. removal of strip of epithelium, is done first on one side and 3-4 weeks later on the other. Voice rest. Speech therapy for proper voice production.

Atrophic laryngitis. Atrophic laryngitis is usually connected aetiologically and pathogenetically with atrophy of the nasal and pharyngeal mucosa. Pollution of air with dust or gases, smoking and abuse of alcohol are among the provoking factors. Patients complain of dryness, tickling and the feeling of a foreign body in the throat, and progressing dysphonia. In the early period of the disease laryngoscopy reveals bright hyperaemia of the mucosa which looks



Treatment. The patient must not smoke or take irritating food; he should rest his voice.

Preparations thinning sputum and facilitating its expectoration should be given.

Throat irrigation and inhalations of an флуимуцил-антибиотик solution should be performed.The irrigations and inhalations are performed 2 times a day using 30-50 ml of the solution for a session. The course lasts 1-2 weeks. The procedures can be done at home in the morning and in the evening. This preparation can also be instilled into the larynx (софрадекс 1-2мл weak irritating and disinfecting properties and therefore the patient's sensitivity to the drug should be checked).

In order to stimulate the action of the glandular apparatus of the mucosa, Флюдитек 1 ст.ложка -3раза в день,uring two weeks.

STENOSIS OF THE LARYNX

Acute stenosis occurs suddenly or develops within a comparatively short period of time. The main pathophysiological factors that should be assessed immediately in acute stenosis of the larynx are the following: (1) the degree of external respiratory insufficiency;

(2) the body reaction to oxygen deficit. The body reserves cannot be realized during acute development of stenosis. The adaptation reactions of the body are respiratory, haemodynamic, blood and tissue reactions. The respiratory reaction is manifested by dyspnoea which

The haemodynamic compensatory reactions are characterized by tachycardia and increased vascular tone, which increase the minute blood volume 4 or 5 times.

In these conditions, increasing stenosis induces severe pathological reactions. Acute stenosis of the larynx can be caused by local inflammatory diseases such as the laryngeal oedema, acute infiltrative or abscessing laryngitis, chondroperichondritis of the larynx or submucous laryngitis, local noninflammatory processes, various injuries, foreign bodies, etc., acute infectious diseases such as measles, scarlet fever, diphtheria and the like, systemic diseases of the body such as diseases of the heart and vessels, of the lungs, the kidneys, etc.

Depending on the degree of stenosis, stridor develops. Examination reveals retraction of the supraclavicular fossae

If stenosis persists, the pulse is accelerated, the lips, the nose and the nails become cyanotic due to accumulation of carbon dioxide and the oxygen deficit and decentration of blood circulation. Inspiratory dyspnoea develops simultaneously.

The following stages classified in the *clinical course* of stenosis:

- stage I, compensation;
- stage II, subcompensation;
- stage III, insufficiency or decompensation;
- stage IV, asphyxia.

stage I - compensation

At the stage of compensation the patient does not develop respiratory distress at rest, but tachypnoea develops during walking; the width of the glottis is 6-7 mm.

stage II – subcompensation

At the stage of subcompensation the patient develops inspiratory dyspnoea at rest, with involvement of the accessory muscles in the respiratory act; the intercostal spaces, soft tissues of the jugular and the supraclavicular fossae are retracted; stridor, pallor and restlessness are characteristic. The glottis is 4-6 mm.

stage III - insufficiency or decompensation

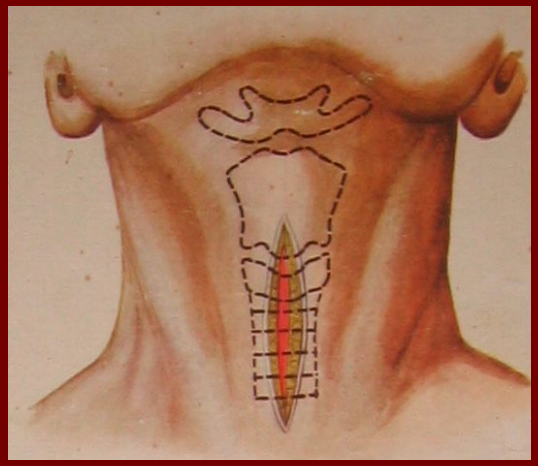
The insufficiency stage is characterized by shallow and accelerated respiration; the patient assumes a forced position (half-sitting in his bed and holding fast on the headrest or some other object). The larynx moves to maximum possible distance up and down. The face is pale and cyanotic; the

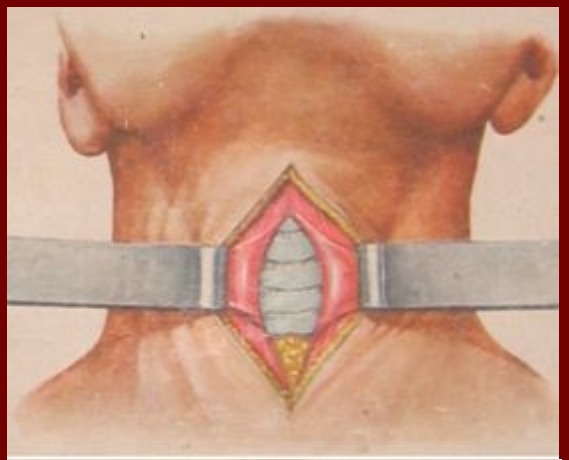
stage IV - asphyxia

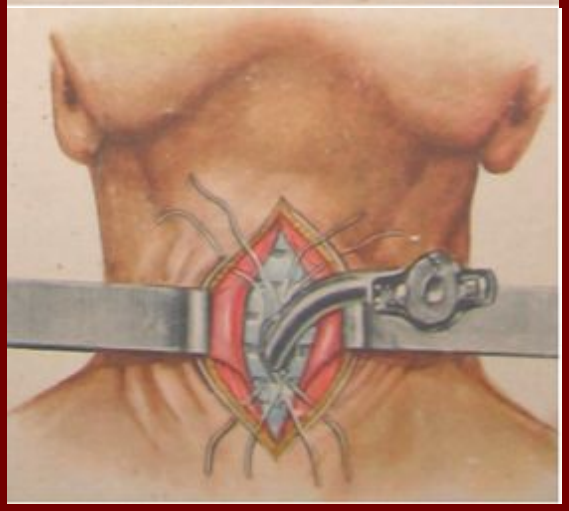
At the stage of asphyxia, respiration is hardly possible and discontinues at any moment. The width of the glottis is about 1 mm. The heart activity is distressed, the pulse is fast and thready, the skin is grey and pallid. In severe cases the patient is unconscious; exophthalmos is characteristic; the patient urinates and defaecates involuntarily; death ensues quickly.

Treatment depends on the cause and stage of acute stenosis. Emergency care in stenosis caused by oedema and inflammation of larinx: antiinflammatory therapy ; use of corticosteroids (3-5 mg. per kg. mass). Glycocorticoids give antiinflammatory, as well as antiallergic affect; Лазикс 2,0 млuse of lytic mixture, consisting of 2% solution of papaverine, 1% dimedrol solution; in clinical conditions

Decompensation (stage III) should be treated surgically: immediate tracheostomy or intubation are indicated. The patient can be intubated with elastic tubes used for intratracheal anaesthesia in intensive therapy departments. Asphyxia (stage IV) requires urgent conicotomy and then tracheostomy.







Chronic stenosis arises due to persistent morphological changes in the larynx and the adjacent organs and tissues. As a rule, chronic stenosis develops slowly and gradually. Causes of chronic stenosis of the larynx are quite varied. Common causative factors are (1) chondroperichondritis (traumatic, infectious, radiation); (2) disturbed mobility of the cricoarytenoid joint; (3) dysfunction of the inferior laryngeal nerves due to toxic neuritis, following strumectomy, compression by a tumour, and the like; (4) tumour, tuberculosis, syphilis.

Patients with chronic stenosis of the larynx often develop bronchitis and emphysema due to long-standing hypoxia; bronchopneumonia is frequent in children. The heart is enlarged and the myocardium hypertrophied.

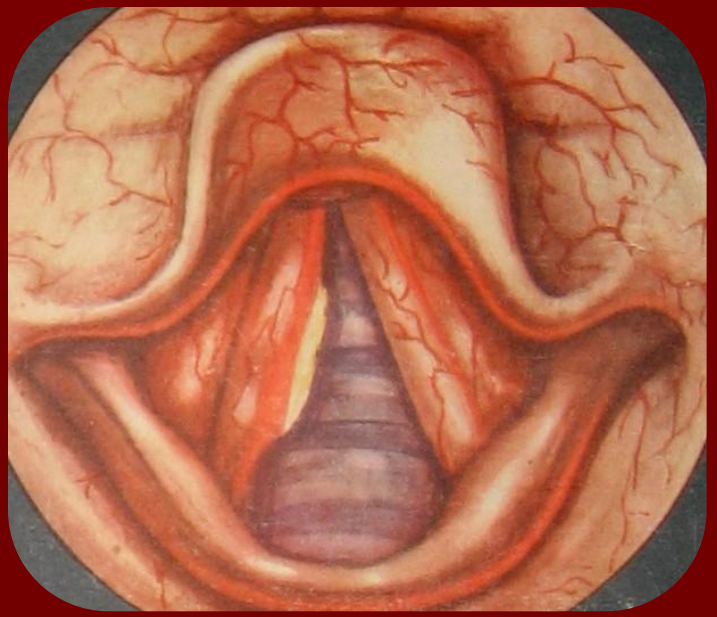
Treatment of chronic stenosis is often very difficult and in some cases the lumen of the larynx is restored to normal size only after a prolonged treatment. Special dilators are used for regular artificial dilatation of the stenosed larynx. Laryngostomy and prolonged (for some months) dilatation of the larynx by T-tubes (better plastic) give more reliable results.

Tuberculosis of the larynx is the most frequently occurring tuberculous affection of the airways. The larynx is infected with tuberculosis mycobacteria mainly by three routes. The most common of them is contact infection with sputum expectorated from the lungs of patients with pulmonary tuberculosis. The other route of ingress is with blood (haematogenic route). The third way of infection spreading is by lymphatics. Three stages are distinguished in the development of a tuberculous process in the larynx: the first stage is **infiltration**; the second is characterized by formation of **ulcers**; and the third stage is associated with affection of the cartilages and **perichondrium**. The vocal function is upset only in cases when the vocal or vestibular folds and the interarytenoid notch are involved.

But the most common sites of infection residence should be remembered. These are the interarytenoid space, arytenoid cartilages and the adjacent parts of the vocal cords. Tuberculosis of the larynx progresses slowly.

Treatment. This should first of all be aimed at elimination of the main disease (usually pulmonary tuberculosis). ВООЗ (изониазид H, ,рифампицин R,пиразинамид Z, стрептомицин F . The combined local use of these preparations is believed to have the best effect. Ulcerated surfaces should be фонофорез with изониазид after preliminary anaesthesia of the larynx with a 10 per cent Lidocaine solution Anaesthetics should be used to prevent or relieve pain during swallowing.

Syphilis of the larynx larynx occurs in extremely rare cases. The secondary stage is manifested by **erythema** simulating catarrhal laryngitis with involvement of the mucous membrane of the vocal folds, arytenoid cartilages and epiglottis, and also by papules and large condylomas. The **tertiary stage** of syphilis of the larynx occurs mainly in males ageing from 30 to 50. Gummas are located mainly in the epiglottis, and less frequently in the interarytenoid notch and on the vestibular folds. When located in the infraglottic space, a gumma appears in the form of a



Tumors of the upper respiratory tract.

Neoplasms of the upper respiratory tract average 3-4 % of all tumours localization. Tumours of larynx average more than half neoplasms of upper respiratory tract, tumours of pharynx are on the second place, tumours of nose and paranasal sinuses are on the third place. Neoplasms of ear are met much rarely.

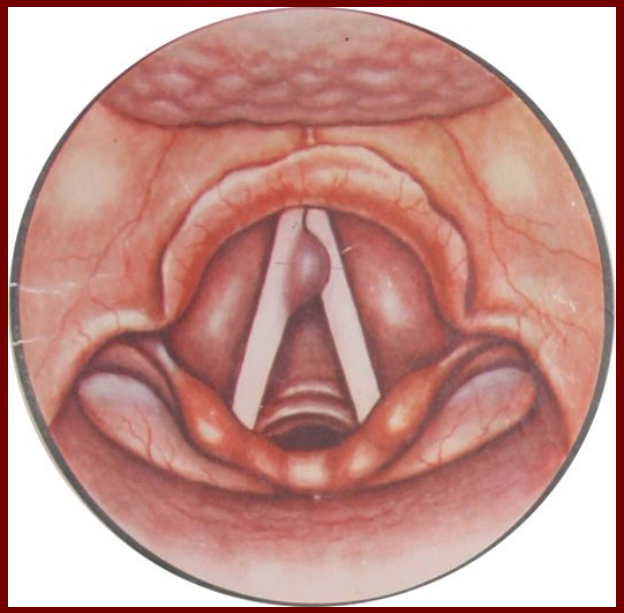
Benign neoplasms are characterized by high degree of differentiation, not infiltrative and not destroying growth (even during rapid growth); they don't give metastasis, don't relapse and are resistant to radial therapy.

Papillomas, hemangiomas and fibromas are the most frequently occurred benign tumours of larynx.

Papilloma is on the first place among the most frequently occurred benign tumours of upper respiratory tract. This tumour develops from flat and transitional epithelium. The most often papilloma becomes localized in larynx, and may occur at any age. Children are effected by papilloma between a year and half and five years old.

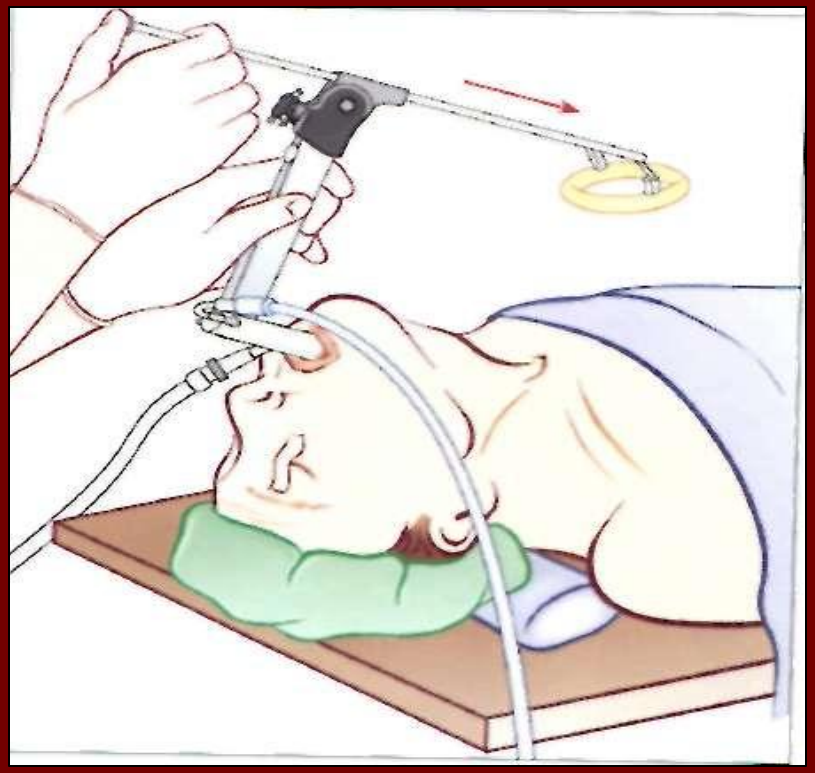
Multiple papillomas are found on vocal cords, extend down to subglottic space and trachea, restrict gap of larynx and cause difficult breathing. During first five years of child's life papilloma grow fast, often relapse in spite of therapy, but almost are never malignant. During puberty papillomas may disappear spontaneous.

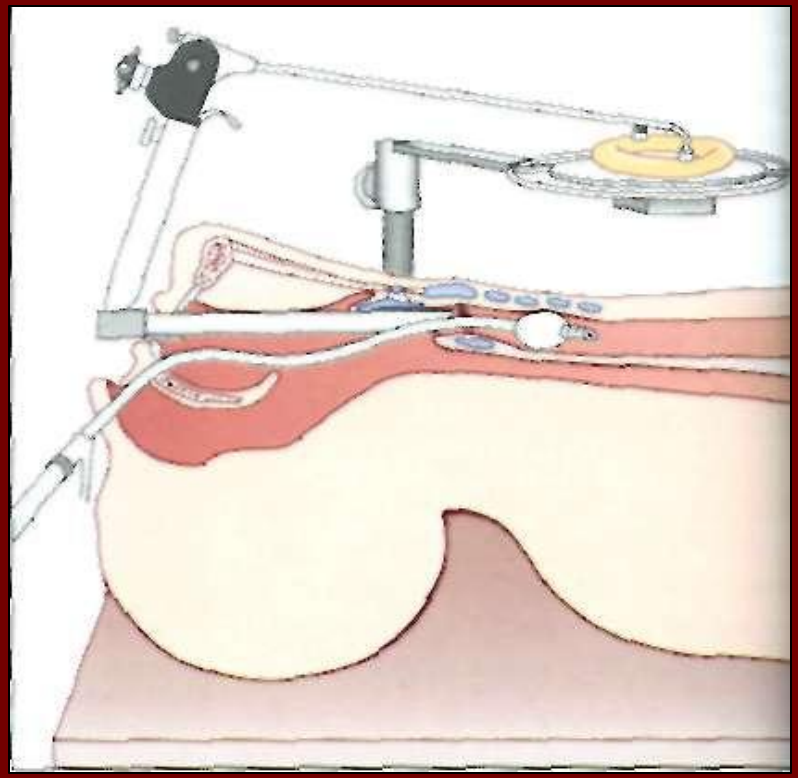
Hard papilloma with proliferous crawling growth is found in every fourth case. Such growth causes transformation papilloma to flat (squamous) cell carcinoma. It is found in 15-20% and gives grounds to regard papilloma of larynx at adult as obligatory precarcinoma.



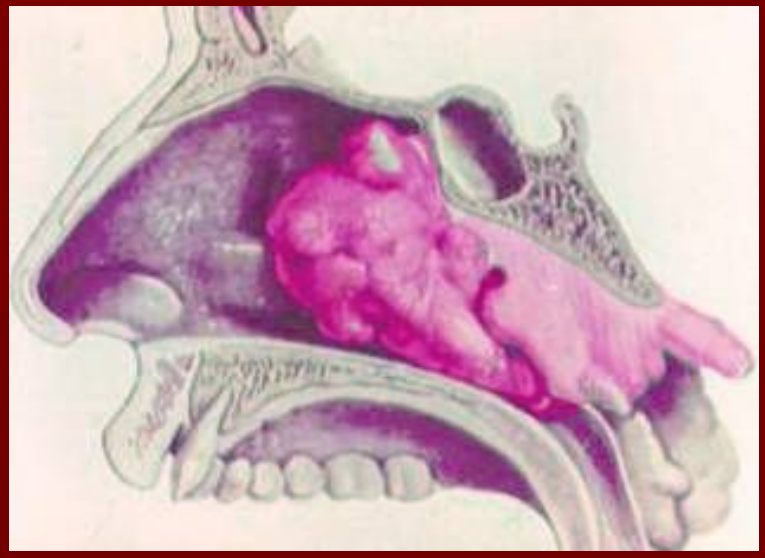
Vascular tumour among benign tumours of upper respiratory tract are the second (take second place). It is usually hemangioma. In larynx fibroma proceeds benignly, it is usually solitary tumour, like millet or no bigger than a pea.

It settles down on free side of vocal cord. Fibroma of larynx manifests by violation of voice, sometimes cough and very rarely hard breathing (when the tumours is big like cherry). Fibroma is removed by endolaryangeal access during laryngoscopy with laryngeal forceps.





Fibroma of nasopharynx is the most often tumour of this localization. It is also called angiofibroma or fibroma of skull base.

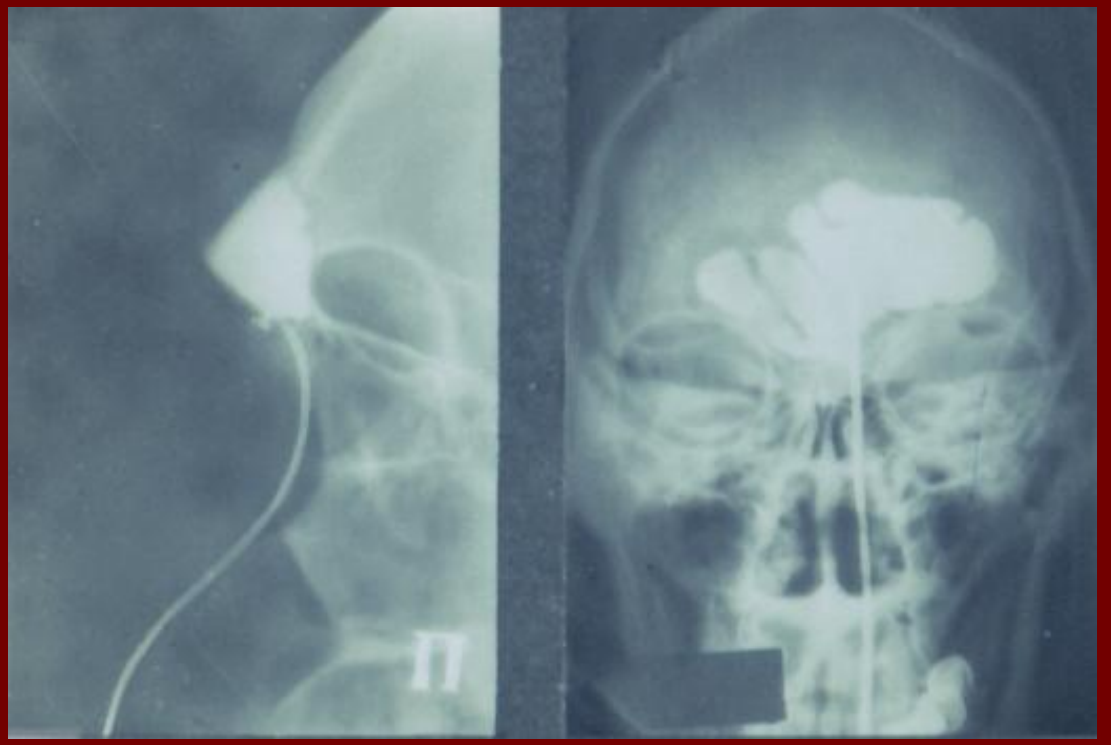


Tumour is occurred at boys and youths; it is found in of nasopharynx, often penetrates in nasal cavity through choanas.

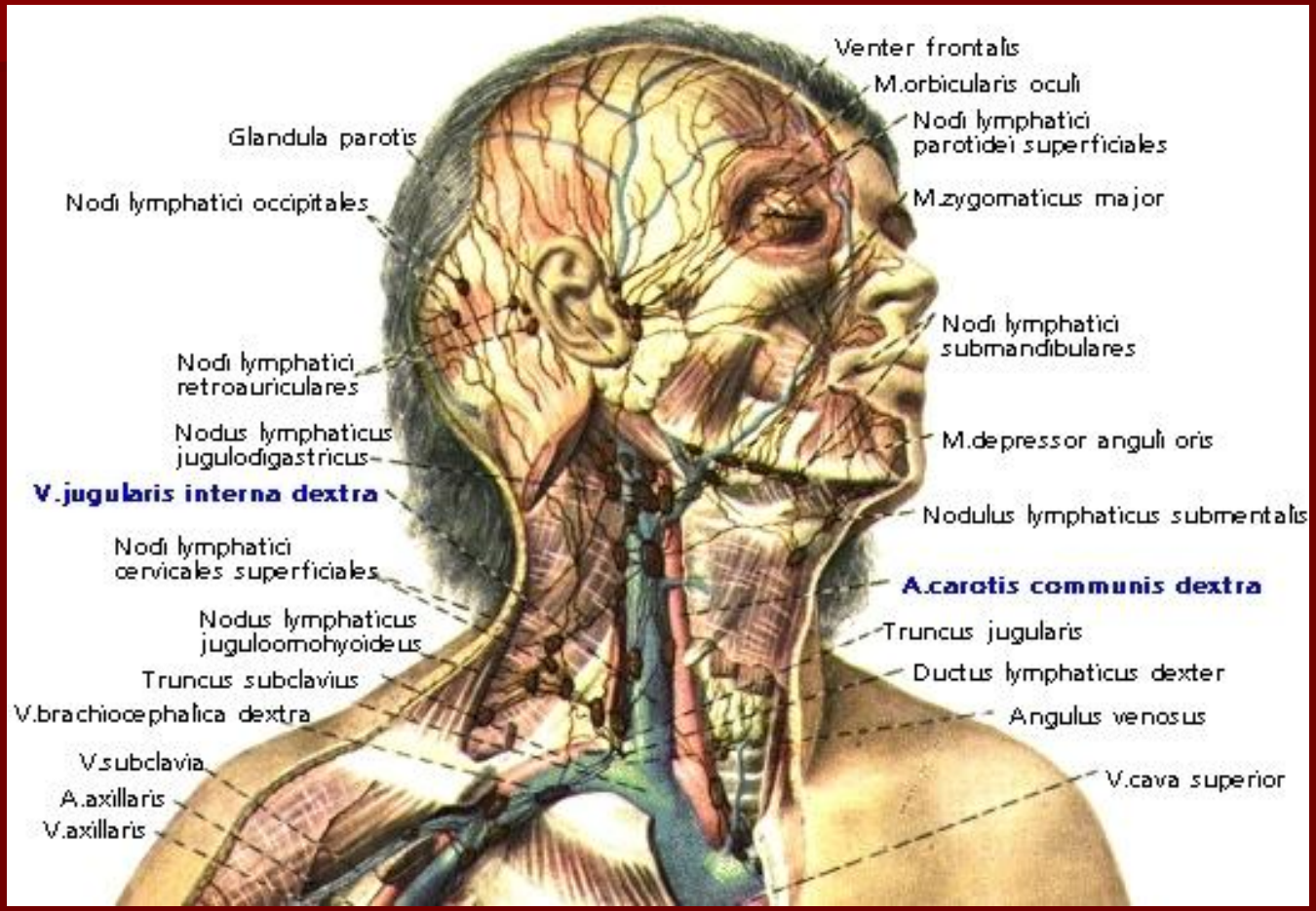
This tumour with expansive growth causes atrophy of osseous walls (in consequence of compression) and can grows in cavity of skull.

Clinic of nasopharynx fibroma is enough typical: increasing difficulty of nasal breathing , then impossibility of nasal breathing through one nasal passage (then through both passage), stuffiness in the ear, relapsing nasal bleeding. During posterior rhinoscopy tumour of purple colour is determined and during palpation we can find that the tumour is solid and uneven. Owing to superficial arrangement of vascular vessels investigation of pharynx quite often is accompanied by bleeding.

Tumors of paranasal sinuses



Lymphatic system



Malignant tumour. Frequency of damages of different parts of upper respiratory tract and ear by malignant tumours is equal: larynx is affected in 67%, pharynx in 18 %, nose and paranasal sinuses are affected in 14%,ear in 1% of observations. Frequency of damages by tumours differs at children: nose and paranasal sinuses are affected in 35%, nasopharynx in 30%, oropharynx in 19%, meddle ear in 16% of cases, cancer of larynx at children occur very rarely.

The most often malignant tumours are found in larynx at adult, and almost always it is flat (squamous) cell carcinoma. Cancer of larynx is on the fourth place among all cancers at men.

At women cancer of larynx is on one of the last places among other cancerous diseases. Many patients with cancer of larynx are admitted for treatment on last stage of disease. Clinic of cancer of larynx in beginning depends on localization of tumour. Patient's complaints are the very usual, occurring in many disorders of larynx.

So, when the tumour is found on epiglottis, patient complains to sensation of discomfort on swallowing, a feeling of a foreign body in the throat. Pain in the throat (spontaneous or on swallowing) disturbs the patient as tumour continues to grow and ulcerate, also the pain radiates to the ear. Small nodular tumour of pale-pink or grey colour is found during laryngoscopy, quite often with ulceration areas covered by coat. It is difficult to find tumour on endophytic growth of tumour, especially in the region of epiglottis's base. That is why in questionable cases it is necessary to perform larynogoscopy with

The beginning of cancer of larynx's upper floor (cord of vestibule, ventricle of larynx) doesn't accompany lonely by subjective symptoms, excepting such light symptoms: changing voice's trimbre, weakness. Laryngoscopy reveals thickening of vestibule cord, more marked in its front region. Vocal cord may be covered by enlarged cord of vestibule or by infiltrated mucous membrane of ventricles of larynx. It takes place when exophytic growth of tumor is observed. The mobility of the affected fold can be limited. The unilateral affection is a very important diagnostic symptom of the initial stage of the disease. Unilateral localization makes it possible to exclude the inflammatory process and it is necessary to make a differential diagnosis with such infectious granulomas as tuberculosis and

The final diagnosis is made after carrying out biopsy.

At the initial stages of the affection of the lower part of the larynx the symptoms are very scanty and vague. Large tumor causes the breach of vocal and then of respiratory functions such as the muffled voice, slight dysponea, hoarseness and increasing difficult breathing. The tumor which grows exophytic may be discovered with the help of the indirect laryngoscopy. The symptoms which appear with the further growth of tumor very little depend upon the region of the initial localization. They become common for cancer of larynx (hoarseness or aphonia, cough, sanguinolent sputum, pain on swallowing which irradiates in the ear, increasing difficult breathing). The tumor sprouts in cartilages of the larynx, causing chondroperichondritis. Metastatic spreading is carried out in

The choice of the method of treatment depends upon the stage of cancer of larynx, its localization and character of tumoral growth. The treatment is **combined or even complex**. It is better to use the combined treatment together with radiotherapy at the first stage when there is limited spreading of the tumor. If a patient undergoes half of the course of radiotherapy and the tumor becomes smaller than half as much, then radiotherapy is continued, if there is no effect, the surgical treatment is recommended to the patient. When you prescribe the radiotherapy for your patient you should take into consideration that cancer of the middle part of the larynx is more radiosensitive, cancer of the vestibule of the larynx is less radiosensitive and the cancer of the lower part is radioresistant. In case of spreading tumors of the first part the surgical treatment

There are various surgical interventions as to the cancer of the larynx depending on the spreading of the tumor:

a) in case of the thyreotomy or laryngofissure when there is limited affection of the middle part of the larynx, the external access of tumor removal is used.

b) when there are limited affections of larynx with the tumor, larynx resection is used (horizontal, diagonal, frontal, sagital).This operation is kind of saving of organ.

c) Laryngectomy or extirpation of the larynx

Comminuted treatment consists of use of the surge and radial methods. Including this fact there are possible the next variants as so:

a) operation with following radiotherapy of the regional metastasing zone as a prophylaxis;

b) radiotherapy at the first stage and if there is no an excessive effect after the half doses affection, then the surgical operation is indicated;

c) Chemotherapy is usually used as a supplemented method to the basic one - radial or surgical.

Results of treatment of a cancer of larynx are estimated by the fifth-years survival rate all observations report that in all stages of diseases the most effective is a combined treatment as this - operation with following irradiation of the regional lymphatic outflow region.