DISEASES OF LARYNX

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The larynx is the organ of voice production.

It is a part of the respiratory tract lying between the trachea and the pharynx, has a framework of cartilages, muscles and ligaments.

The entrance to the larynx is guarded by a “U”-shaped hyoid bone, which is also the supportive structure for the tongue.
STENOSIS OF LARYNX

- STENOSIS of larynx is narrowing of larynx, resulting in difficulty of breathing through it.

- STENOSIS of larynx, similarly as well as its edema is not an independent nosologic unit.

- This pathology can be the display of different diseases of larynx.
STENOSIS OF LARYNX

CLASSIFICATION

- Acute stenosis
  is quickly occurring (during a few seconds, minutes, hours or days)

- Chronic stenosis
  develops during a few weeks, months or years.
CAUSES OF ACUTE STENOSIS OF LARYNX

- Edema
- Foreign bodies of larynx and large foreign bodies at the entrance into the gullet
- Acute laryngotracheitis at children
- Diphtheria of larynx
- Laryngospasm
- Trauma of larynx
Edema of larynx is not an independent disease, and is only one of manifestations of many pathological processes.

Edema of larynx can be of inflammatory and noninflammatory nature.

It is very important to diagnose, as medical tactics of treatment depends on it.
Acute laryngitis is catarrhal inflammation of mucous membrane, sub mucous layer and internal muscles of larynx.
ACUTE LARYNGITIS

Etiology:
respirator viruses, bacterial (coccal) flora.

Provoke`s factors:
1) thermal factor;
2) alcohol, smoking;
3) overload of voice;
4) dust, gases.
CLINICAL PICTURE OF ACUTE LARYNGITIS

1. Characterized by an outbreak at the good common state of patient or small indisposition.
2. The temperature of body remains normal or a little rises.
3. Feeling of dryness, burning, maring, tickling, foreign body appears in a larynx.
4. A cough is dry, then moist.
5. Hoarse.

II. Laryngoscopy:
TREATMENT OF ACUTE LARYNGITIS

1. Local treatment

1. Dry cough: tusupreks, falimint, libeksin.

2. Moist cough: preparations of ACC, sinupret, Mucaltinum, bromgeksin.

3. Inhalations are steam, oily, alkaline, with antibiotics, proteolitic enzymes (by Trypsinum, chymotrypsin).


5. Instylation in a larynx: 1% oily solution of Menthololum, antibiotics, gidrokortizon, 3% solution of Protargolum or kolargolou.

6. Counter-attractions: hot compress on a larynx.

7. General treatment: antibiotics, antihistaminic preparations, preparations of calcium, ascorbic acid.
**ACUTE LARYNGOTRACHEITIS**

- **Acute laryngotracheitis (croup)** is a common viral infection which generally affects children younger than 5 years of age. Typically, this illness lasts from 3 to 7 days and it is common in the autumn and winter.

- Parainfluenza I is the most common implicated viral agent, but parainfluenza II, influenza A, rhinovirus, and respiratory syncytial virus may also be causative.

- The child first develops a febrile URI followed days later by the classic "barky" or croupy cough; the cough is usually nonproductive and worsens at night.
**Acute Laryngotracheitis**

- Usually, croup is self-limited, but if significant edema develops, progressive airway difficulty may ensue.

- Stridor with intercostal and supraclavicular retractions becomes prominent as the child struggles for air.

- In severe cases, without treatment, the airway obstruction may progress, exhaustion may ensue, and complete airway obstruction may occur.

- Most often, the diagnosis is based on the history and on lateral neck radiographs, which usually reveal the classic "steeple sign," caused by subglottic narrowing due to edema.
Acute Laryngotracheitis (Croup)

- In laryngotracheitis, the subglottic larynx is the primary site of inflammation and edema formation, although the trachea may also be involved.

- In severe cases, epithelial sloughing, associated with tenacious mucoid secretions, may accompany the inflammatory process, and further compromise the airway.

- It should be noted that the supraglottic larynx is usually unaffected in laryngotracheitis, and this helps differentiate it from other causes of airway obstruction in young children.
Acute Laryngotracheitis (Croup)

- Treatment is directed at reducing the edema, thinning the secretions, and in severe cases, establishing an airway. Intensive humidification and hydration are begun to help thin the secretions and soften the crusts in the airway.

- If symptoms worsen, aerosolized epinephrine treatments and high-dose corticosteroids are used to prevent further progression of the edema.

- If impending airway obstruction develops, intubations or tracheotomy is required to secure the airway and permit adequate pulmonary toilet.

- Antibiotics are indicated for secondary bacterial infection, which may be caused by staphylococci, streptococci, or pneumococci.
Treatment of acute obstructing laryngotracheobronchitis

- Organization.
- Treatment 1 and 2 st. of stenosis of larynx. A vapotherapy is under awning.
- Prolonged intubation and tracheostomy.
- Decanulation
Plan of Treatment of Acute Laryngotracheitis

- Application of interferon, antiinfluenza gamma-globulin
- Antibiotics. (Intramuscularly)
- Intravenously:
  - Sol. Glucosae 20% 10-20 ml
  - Sol. Calcii chloridi 10% ml per 1 year;
  - Sol. Ac. ascorbinici 5% 1 ml per 1 year;
  - Sol. Euphyllini 2,4% 0,2 ml per 1 kg;
  - Sol. Prednisoloni 2-3 mg per 1 kg.
- Intramuscularly injected: Sol. Dimedroli 1% 1,0
- Distracting procedures (hot foot-baths, mustard plasters on a thorax) and inhalations are very effective. In the complement of mixtures for inhalations antihistaminic, spasmolytic preparations and proteolitic enzymes are injected.
DIFFERENTIAL DIAGNOSIS

- Diphtheria.
- Foreign bodies of larynx.
- Asthma.
- Stenosis of larynx at to scarlatina, windy pox.
- Uremia.
- Papilomatosis of larynx.
Laryngeal Diphtheria

- Laryngeal diphtheria is very uncommon; however, outbreaks of diphtheria have recently been reported in eastern Europe, believed to be due to low immunization rates.

- It is caused by *Corynebacterium diphtheriae* and generally affects individual soldiers than 6 years of age. A febrile illness of slow onset associated with sore throat and *dysphonia* is followed by progressive airway obstruction.
Laryngeal Diphtheria

- The organism causes an exudative inflammatory response of the mucous membranes, which results in a thick, gray-green, plaque-like membranous exudate over the tonsils, pharynx, and larynx. Characteristically, the exudate is difficult to dislodge, and it bleeds when it is removed. Cultures and smears are obtained for confirmation of the diagnosis.

- Treatment consists of establishing a safe airway, administration of *diphtheria antitoxin*, and erythromycin or penicillin to eradicate the organism. Intubation is contraindicated because it may dislodge a plaque and cause airway obstruction, thus, tracheotomy is often performed. Mortality results largely from the neuropathic responses to the diphtheria toxin.

- If the patient has been previously immunized against diphtheria, the disease may still occur, but tends to be mild.
TRAUMA OF LARYNX

- **Mechanical traumas**
  (blow in the region of larynx)

- **Fire wounds**

- **Thermal traumas** are burns of larynx by hot food, getting frostbitten of larynx.

- **Chemical traumas** - acids and alkalis. Such trauma is possible in the case of poisoning, when a person drinks strong acid or caustic alkali by chance or for suicide.
CAUSES OF CHRONIC STENOSIS OF LARYNX

- Tumors and cysts of larynx
- Infectious granulomas such as gummatous syphilis of larynx, tuberculosis of larynx, scleroma
- Cicatricial changes as a result of chondroperichondritis of larynx, burns, traumatic damage, gunshot wounds, protracted intubation, during ALV or prolonged intubation at children connected with acute laryngotracheitis; sometimes – after tracheostomy, especially at the children of junior age
- Innate pathology of larynx (at membranes and etc)
- **Bilateral paralyses of sublaryngeal nerves.**

Such paralysis can be the result of carried Acute Respiratory Virus Infections; intraoperational trauma during a strumectomy, when both recurrent nerves are intersected.
Innervations' of larynx

1. n. vagus
2. n. laryngeus superior
   (a - upper branches,
    b - lower branches);
3. recurrent laryngeal
   nerve
Main symptom is **inciter shortness**

- the 1th stage is the stage of the *compensated* breathing or *compensation*;
- the 2th stage is the stage of incomplete compensation of breathing, or subindemnification;
- the 3th stage is the stage of *decompensation* of breathing, or *decompensation*;
- the 4th stage is the stage of asphyxia, or terminal stage;
I. The such patient must receive *intravenously*:

- Sol. Glucosae 40% 20,0
- Sol. Calci chloridi 10% 10,0
- Sol. Acidi ascorbinici 5% 5,0
- Sol. Euphyllini 2,4 % 5,0-10,0
- Sol. Prednisoloni 60-90 мг

II. *Intramuscularly* injected are:

- Sol. Dimedroli 1% 2,0
  (Sol. Pipolpheni 2,5% 2,0)

III. Diuretics (furosemid)

IV. Abducent procedures are conducted: hot footbaths, mustard plasters on a thorax and gastrocnemius muscles

V. *Inhalations* by water-wet oxygen
VI. At the inflammatory edema of larynx it is necessary to conduct dissection of abscess in larynx or organs connected with it.

VII. At 3th and 4th stages of stenosis artificial renewal of patency of respiratory tracts is always used. There are only two such methods: intubation and tracheostomy.
INDICATION FOR TRACHEOSTOMY

- Warning of asphyxia
- Draining of respiratory tracts
- Prolonged intubations.

CLASSIFICATION

- upper tracheostomy;
- middle tracheostomy;
- lower tracheostomy.

By its topographical relation to the isthmus of the thyroid gland, this operation may be superior, median and inferior. Adults usually undergo superior tracheotony, while on children ill with diphtheria the inferior one is performed.
Emergency tracheostomy may be a difficult operation, particularly if done under local anesthetic when a general anesthetic with intubation is not practical.

An opening into the trachea through the cricothyroid membrane offers a simpler and more direct relief for upper respiratory tract obstruction.
STAGES OF TRACHEOSTOMY

The vertical skin incision
STAGES OF TRACHEOSTOMY
STAGES OF TRACHEOSTOMY
STAGES OF TRACHEOSTOMY
COMPLICATION OF TRACHEOSTOMY

- Bleeding.
- Emphysema of hypoderm, pnevmotoraks, pnevmomediastinum.
- A stop of breathing is during the section of trachea.
- Wound of gullet.
- A festering tracheobronchitis after operation
Acute obstructing laryngotraceobronchitis at children

Acute obstructing laryngotraceobronchitis (laryngotraceobronchitis acuta) is the widespread disease at children, which develops as the display of ARVI, and is accompanied by the obstruction of larynx, trachea and bronchial tubes; in this connection it is dangerous for life of child.
Etiology

- Flu - 56.8%
- Parainfluenza - 20.1%
- Adenoviruss - 16.7%
- A viral infection is Mixed - 6.4%
Clinical picture:

- Change of voice.
- Rough «barking» cough.
- Difficulty of breathing as a result of:
  - a) to the edema and infiltration;
  - b) to the spasm of muscles;
Chondroperichondritis of larynges

- An inflammatory process in a larynx can spread on perichondrium and cartilage, because of what develops to the chondroperichondritis larynx.

- Clinic. A patient complains about pain in the area of larynx, with swallowing pains, increase of body temperature, hoarseness, difficulty of breathing. The state of patient is severe. There are smoothi of contours of larynx, some increase of volume of neck, bulging of cartilages and acute pains at palpation, fluctuation and cervical lymphadenitis comes to lung sometimes.

- For a laryngoscopic picture the oedematousness and infiltration of mucous membrane is characteristic unilaterally or bilaterally. (at a widespread process). Mobility of one or both halves of larynx is failed.
Laryngeal quinsy

- Under the term «laryngeal quinsy» (angina laryngea) we understand acute heterospecific inflammation of lymphadenoid tissue of larynx.

- Etiology: bacterial (coccal) flora.

- Clinical picture – characterized by considerable worsening of the common state of patient, the temperature of body rises to 38-39 °C.

- Palpation of region of larynx can be painful.

- The regional lymphatic knots of neck are multiplied, and become painful at palpation.

- At laryngoscopy hyperemia and infiltration of mucous membrane of epiglottis, aryepiglottis, pre-entrance and vocal folds of pear-shaped pockets are marked.
Treatment of laryngeal quinsy

- **Treatment.** Patients with a laryngeal quinsy are prescribed a powerful antibacterial therapy.
- Prescription of dehydratational therapy is obligatory, as there is the threat of development of stenosis of larynx.
- For diminishing of edema of larynx we prescribe intravenously a 40% solution of glucose, 10% solution of calcium of chloride, 60-90 mgs of prednisolone, diuretics (lasics, verospiron), antihistaminic drugs intramuscularly (diphenhydramine hydrochloride, pipolphen, suprastin and other).
- It is possible to use distracting procedures - hot foot-baths.
Under phlegmonous laryngitis (laryngitis phlegmonosa) we understand the acute inflammatory disease of larynx, at which a purulent process spreads not only into a submucous layer but also in muscles, copulas of larynx, and sometimes perichondrium and cartilages engaged in this process (abscesses can appear in area of epiglottis, aryepiglottis folds, arytenoid cartilages).

Etiology: bacterial (coccal) flora.

Clinic. The disease begins acutely. Patients complain about a general weakness, malaise, broken, pharyngalgias, fervescence. Great pains are marked at the development of abscess on epiglottis and aryepiglottic folds. If an inflammatory process is localized in the area of glottis, hoarseness, difficulty of breathing appear.
Treatment of phlegmonous laryngitis

- Treatment of phlegmonous laryngitis includes application of large doses of antibiotics of wide spectrum of action. At the discovery of abscess it is necessary to open it by a laryngeal knife. At the developing acute stenosis the urgent tracheostomy is routined. At abscesses on neck or in mediastinum the abscesses of neck must be opened mediastinotomy, must be performed