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Diagnosis and Treatment of Foreign Body in The Respiratory Tract in Children

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Annotation: A foreign body in the respiratory tract in children is the presence of foreign objects in the larynx or trieobronchial tree of a child. The problem is mainly diagnosed in patients under 5 years of age. Organic (pieces of food, seeds, extracted teeth) and inorganic particles (coins, buttons, parts from toys) can enter the respiratory system. The condition is manifested by a sudden attack of choking and coughing, a blue face, and restlessness of the child. Diagnosis is carried out on an emergency basis according to anamnesis, radiography, and bronchoscopy. Treatment involves removing the foreign body endoscopically or during classical surgery.
Kalit so'zlar: foreign body, child, endoscopically, larynx

General information

Foreign bodies (FBs) of the respiratory and digestive tracts are one of the most common medical problems in young children. There is an unspoken rule: all small objects that are in the baby's hands, without parental supervision, quickly end up in the nose or mouth. Most often, the situation occurs before the age of 5 years, when the child actively explores the world through tactile sensations and has the habit of pulling new objects into his mouth. Up to 70-80% of cases are bronchial FB, less often foreign objects get stuck in the larynx and trachea.

Causes

Any small object of organic or inorganic origin can become stuck in the respiratory tract. The most common finds in pediatric otorhinolaryngology and surgery are nuts and plant seeds, beads, buttons, coins and small parts of toys. Less common are paper clips, pins, nails and other dangerous items with sharp edges. There are cases of inhalation of a knocked out or fallen tooth.

Frequent episodes of foreign body aspiration are caused by the physiological characteristics of young patients. They have poorly developed protective reflexes of the respiratory tract: spasm of the entrance to the larynx and closure of the glottis do not occur, so the object passes further without hindrance. In addition, in children, the larynx is located high and relatively close to the teeth; the moment of penetration of a foreign body takes only a second and is not accompanied by a reflex cough.

Pathogenesis

The main mechanism for the introduction of a foreign body into the respiratory tract in children is accidental inhalation of small things that are in the mouth. This is facilitated by laughter, talking, crying and screaming, which are accompanied by a sharp breath. A strong flow of air carries a small object deep into the respiratory tract, where it is retained at the level of the larynx, trachea or bronchi. How deeply the Foreign body will penetrate the respiratory system depends on its shape and size.

Pathomorphological changes are determined by the material, shape, and duration of exposure to the respiratory system. Round objects made of inert materials constitute a mechanical obstacle. Sharp parts can damage the mucous membrane, cause bleeding and inflammation. When inhaling metal objects, swelling of the mucous membrane and exudation phenomena occur, which, without treatment, lead to sclerosis and scarring.

Symptoms

Foreign body of the larynx

The first respiratory structure on the path of an aspirated object is the larynx. Large FBs are most often retained here and can become fixed in the relatively wide lumen of the organ. Small particles are located in the glottis area or under the vocal folds. In the area of the larynx, needles, hooks, nails and other sharp parts can be found that are attached to the mucous membrane and cannot move further, despite their small size.

Clinic

A foreign body in the larynx develops suddenly with signs of acute asphyxia. The child experiences an attack of suffocation, which is accompanied by convulsive attempts to inhale, redness or a bluish tint to the face, a persistent cough and even vomiting. After 10-30 minutes, the initial protective reflex is exhausted, so breathing is partially restored, and the victim's condition improves. However, severe shortness of breath with difficulty in inhaling remains.

Foreign bodies in the larynx change their position under the influence of air flow, so they can again clog the lumen of the respiratory system and cause repeated attacks of suffocation. Such episodes alternate with the child's relatively normal state of health. Another characteristic symptom is hoarseness of voice up to aphonia. It indicates the location of the object in the area of the vocal folds.

Tracheal foreign body

In the next section of the respiratory tract, the trachea, bodies of medium size and round shape are retained, since they easily slip through the glottis. Most often, beads, beans, and nuts are found here. With this localization, the symptoms are less intense compared to foreign objects in the larynx. The main symptom is a paroxysmal cough, which intensifies at night, when the child is restless and crying. Coughing attacks are prolonged and painful, reminiscent of the clinical picture of whooping cough. They are accompanied by shortness of breath, hoarse breathing, and in severe cases they provoke vomiting. When a child coughs, the skin around the lips turns blue. Round foreign bodies in the trachea can move freely, causing the pathognomonic sign of balloting: "popping" sounds during laughter, crying and coughing.

Foreign body of the bronchi

The smallest particles, which have different shapes, surfaces and materials, reach the bronchial tree. In 80% of cases they enter the right bronchus, which is shorter and wider than the left. When the main bronchus is completely blocked, a sudden paroxysm of suffocation, coughing, and hoarse breathing occurs. The condition quickly gives way to the stage of compensation, after which the dynamics of the disease will depend on the development of atelectasis and other complications.

Small objects that are fixed in the branches of the bronchial tree do not initially cause significant clinical manifestations. Respiratory disorders increase gradually when a foreign body causes inflammation and other pathological processes in the bronchi. The child has coughing attacks, wheezing, shortness of breath and cyanosis that can be discerned from a distance. Fever, lack of appetite and other symptoms of infectious intoxication are possible.

Complications

The main danger of a foreign body is asphyxia, which occurs when the lumen of the upper respiratory tract is completely blocked. The condition requires emergency care, since in a matter of minutes it

leads to hypoxia and can be fatal. Early complications also include pulmonary hemorrhage, atelectasis, acute tracheobronchitis and pneumonia. Occasionally, a child is diagnosed with mediastinal emphysema.

When IT is in the respiratory system for a long time, it provokes the development of a chronic purulent process and gradual destruction of surrounding tissues. In children, local bronchiectasis, stenosis of the bronchial lumen and corresponding breathing disorders are formed. If a foreign object is not detected in time, there is a risk of developing chronic tracheobronchitis, which does not respond well to traditional treatment and often recurs.

Diagnostics

Any respiratory disorder requires examination by a pediatrician or pediatric pulmonologist. In emergency situations, it is necessary to call an ambulance team. During a physical examination, attention is paid to the nature of breathing, the presence of wheezing and the balloting symptom, areas of weakened breathing in the lungs according to auscultation. FB aspiration is confirmed by the results of the following diagnostic methods:

X-ray of the OGK. X-ray images can reveal radiopaque objects, symptoms of pneumonia, pneumothorax, and atelectasis. Non-contrasting foreign bodies are indicated by reactive inflammation. Diagnosis of IT at the bronchial level is carried out using fluoroscopy. The presence of pathology is indicated by the “click” symptom – a jerk-like displacement of the mediastinum towards the affected lung.

CT scan of the lungs. Computed tomography is an informative way to visualize non-contrast objects that cannot be identified with standard radiography in two projections. A CT image provides comprehensive information about the structure and pathologies of the bronchopulmonary system and is widely used in differential diagnosis.

Endoscopy. The invasive method shows the greatest information content and allows you to combine diagnostic and therapeutic tasks within one manipulation. Taking into account the clinical picture, the child is prescribed indirect or direct laryngoscopy, tracheobronchoscopy.

Differential diagnosis

If the foreign body is located high and causes typical symptoms of asphyxia, making a diagnosis is not difficult. Difficulties arise when the pathology has few symptoms, if the moment of aspiration went unnoticed. The condition must be differentiated from other diseases of the respiratory system:

acute bronchitis and bronchiolitis;

pneumonia;

broncho-obstructive syndrome due to allergies;

congenital malformations of the bronchi and lungs.

Treatment of a foreign body in the respiratory tract in children

First aid

The main task of parents in case of acute respiratory problems and suspected aspiration of a foreign object is to call a medical team as quickly as possible, which will provide qualified treatment. Before the doctors arrive, you need to try to calm the child down and persuade him not to hold back his cough. There is no need to offer fluids or try to remove the foreign body yourself, as there is a risk of pushing it deeper into the airways and causing complications.

If the child’s condition sharply deteriorates and consciousness is impaired, first aid techniques are allowed. Children under one year of age should be placed with their stomach on your forearm, with the baby's face facing the palm and looking down. Using the edge of the palm of the other hand, give 3-5 gentle blows to the interscapular area to stimulate the removal of the foreign body. If IT appears in the oral cavity, it is carefully removed.

In older children, the Heimlich maneuver can be performed. The parent sits behind the standing or sitting child, wrapping his arms around his upper abdomen. The palms must be placed on top of each other, placed in the middle between the navel and the xiphoid process. Next, make sharp pushes in the upward direction - up to 5 times with an interval of 3 seconds. In many cases, a successfully performed maneuver “pushes out” the foreign body, after which breathing is restored.

Surgery

All foreign objects must be removed, regardless of their size and material. This will require the help of an ENT doctor or pediatric surgeon. The scope of instrumental manipulations is determined by the depth of the foreign body, the presence of complications, and the general condition of the victim. Treatment is carried out in the pediatric thoracic department under general anesthesia.

Whenever possible, the endoscopic method is used. To remove stuck objects in the larynx and the initial part of the trachea, direct laryngoscopy is used. Deeper located foreign bodies are removed during tracheobronchoscopy. If the object has sharp edges and is wedged into the mucous membrane, a tracheotomy or bronchotomy will be required. Removal of stuck particles from small bronchi and lung tissue is carried out during thoracotomy.

Prognosis and prevention

The outcome of the disease depends on the timeliness of medical care. The faster the foreign body is removed, the lower the risk of developing acute and chronic complications. The greatest threat is posed by large objects and seeds that can swell in the respiratory tract, as they quickly impair breathing and can cause death.

To reduce the risk of a foreign body entering the respiratory tract in children, it is necessary to teach the child to chew food thoroughly and not allow him to eat on the go or while playing. When the child begins to crawl and walk, remove all small objects from his reach if possible. When choosing toys, you should take into account age restrictions; do not buy options with a large number of miniature parts.

References:

1. Диагностика и лечение инородных тел дыхательных путей у детей/ Ж.А. Шамсиев, Ж.А. Рузиев// Вестник экстренной медицины. – 2020. – №4.
2. Необычные инородные тела у детей/ Д.М. Мустафаев, В.И. Егоров// Медицина экстремальный ситуаций. – 2018. – №1.
3. Инородные тела нижних дыхательный путей у детей: современные диагностические и лечебные подходы/ Ю.Ю. Русецкий, О.А. Спиранский. И.О. Чернышенко// Педиатрия. – 2015. – №4.
4. Осложнения инородных тел дыхательных путей/ Б.М. Блохин// Приложение Consilium Medicum. Педиатрия. – 2013. – №2.
5. Israilov I., Isakov A. ISSUES OF MEDICAL ETHICS AND DEONTOLOGY IN THE PRACTICE OF A SURGEON AT THE PRESENT STAGE //Евразийский журнал медицинских и естественных наук. – 2024. – Т. 4. – №. 2. – С. 66-70.
6. Sh A. D. et al. Clinical and instrumental characteristics of postoperative ventral hernias in choosing the optimal method of plastic surgery //Achievements of science and education. – 2020. – №. 1. – С. 55.
7. Шамсиев А. М. и др. Лечение лимфангиом у детей //Вопросы науки и образования. – 2020. – №. 7 (91). – С. 90-100.

8. Мардонов Б. А. и др. Клинико-инструментальная характеристика послеоперационных вентральных грыж в выборе оптимального способа пластики //Достижения науки и образования. – 2020. – №. 1 (55). – С. 54-60.
9. Шамсиев А. М. и др. Значение ультразвуковой сонографии при диагностике аппендикулярных перитонитов у детей //Современные инновации: актуальные направления научных исследований. – 2017. – С. 50-54.
10. Amirovich M. B. et al. Optimization of treatment of patients with ventral hernia //Academy. – 2020. – №. 3 (54). – С. 109-116.
11. Шамсиев А. М. и др. Значение ультразвуковой сонографии при диагностике аппендикулярных перитонитов у детей //Современные инновации: актуальные направления научных исследований. – 2017. – С. 50-54.
12. Бабаяров К. Р. и др. Достижения И Проблемы Педиатрическоя Анестезиологии И Интенсивной Терапии //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 6. – С. 287-291.
13. Shamsiev J. A. et al. Characteristic of Late Postoperative Complications and Recurrences of Anorectal Malformations Developed after Various Types of Proctoplastics //Annals of the Romanian Society for Cell Biology. – 2021. – С. 5194-5203.
14. Шамсиев Ж. А. и др. ПРИМЕНЕНИЕ СОВРЕМЕННЫХ ТЕХНОЛОГИЙ В ДЕТСКОЙ УРОЛОГИИ //Детская хирургия. – 2021. – Т. 25. – №. S1. – С. 79-79.
15. SHAMSIEV J. et al. Analysis of aspirated foreign bodies of the respiratory ways in children //International Journal of Pharmaceutical Research (09752366). – 2020. – Т. 12. – №. 1.
16. OGLi N. A. M. et al. Results of surgical treatment of intaoperative injuries of magisterial bile ducts //Вопросы науки и образования. – 2020. – №. 13 (97). – С. 98-107.
17. Shamsiev Z. A. et al. NEOTLOZhNYE MEROPRIYaTIYaPRI ABDOMINAL'NOY TRAVME U DETEY //Russian Journal of Pediatric Surgery, Anesthesia and Intensive Care. – 2020. – Т. 10. – №. 3S. – С. 194.
18. Шамсиев, Ж. А., Саидов, М. С., Исаков, А. М., Данияров, Э. С., & Махмудов, З. М. ДИАГНОСТИКА, ЛЕЧЕНИЕ И РЕАБИЛИТАЦИЯ ДЕТЕЙ С АНОРЕКТАЛЬНЫМИ МАЛЬФОРМАЦИЯМИ.
19. Шамсиев, А. М., Шамсиев, Ж. А., Махмудов, З. М., & Исаков, А. М. (2021). УСОВЕРШЕНСТВОВАНИЕ РАННЕЙ ДИАГНОСТИКИ ОСТРОГО ГЕМАТОГЕННОГО ОСТЕОМИЕЛИТА КОСТЕЙ ТАЗОБЕДРЕННОГО СУСТАВА У ДЕТЕЙ. *Детская хирургия*, *25*(S1), 81-81.
20. ШАМСИЕВ, Ж., ШАМСИЕВ, А., ИСАКОВ, А., ДУСЯРОВ, Ж., & УНАБОЕВ, Ж. (2021). ИЗУЧЕНИЕ IN VITRO ВЛИЯНИЯ УРОВНЯ КИСЛОТНОСТИ ЖЕЛУДОЧНОГО СОКА НА ЖИЗНЕСПОСОБНОСТЬ ЯИЦ ЭХИНОКОККА. In *Эксперимент в хирургии и онкологии* (pp. 74-78).
21. ШАМСИЕВ, Ж., ШАМСИЕВ, А., МАХМУДОВ, З., ИСАКОВ, А., & ДАНИЯРОВ, Э. (2021). ГИПОАЦИДНОЕ СОСТОЯНИЕ ЖЕЛУДОЧНОГО СОКА У ДЕТЕЙ КАК ЗНАЧИМЫЙ ФАКТОР РИСКА ЗАРАЖЕНИЯ ЭХИНОКОККОМ. In *Эксперимент в хирургии и онкологии* (pp. 69-73).
22. ШАМСИЕВ, Ж., ШАМСИЕВ, А., МАХМУДОВ, З., ДАНИЯРОВ, Э., & ИСАКОВ, А. (2021). МОРФОЛОГИЯ ЭХИНОКОККОВОЙ КИСТЫ ПОСЛЕ АНТИПАРАЗИТАРНОЙ ОБРАБОТКИ. In Эксперимент в хирургии и онкологии (pp. 53-56).