THE CLINICAL CASE REPORT: THE RESULTS OF SURGICAL TREATMENT OF CHILD WITH LEFT MAIN BRONCHUS CONGENITAL STENOSIS COMPLICATED WITH LOW LOBE BRONCHIECTASIS

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Abstract.*The paper presents the result of treatment for congenital left main bronchus stenosis complicated by chronic pneumonia. The patient has had a thoracotomy, resection of the stenosed left main bronchus, and an "end-to-end" anastomosis. In the background of congenital bronchial abnormalities, bronchiectasis was found in the low lobe of the left main bronchus. This method is preferred in children because it allows for organ-saving procedures to be performed.*

Keywords: *Trachea, expiratory stenosis, trachea and main bronchi, bronchial stenosis, bronchial resection, bronchial endo-filling.*

Congenital malformations of the respiratory system are one of the most complex diagnostics, pathogenic, and therapeutic problems of modern pediatric thoracic surgery. Anomalies of the respiratory system arise as a result of embryonic or postnatal developmental disorders, but clinically, congenital lung anomalies manifest themselves after various inflammatory processes join them, in the form of suppuration, most often manifested in early childhood and less often in adults. [1,4,7] Finding out the diagnosis of the disease is difficult due to the lack of clear clinical and morphological changes, which are smoothed out against the background of a long inflammatory process.

Among the specialists involved in pediatric thoracic surgery, there is no single view on the pathogenesis of various anomalies of the respiratory system, their classification, the reliability of individual diagnostic methods, indications for surgical treatment, its volume, the timing of surgery, and rehabilitation.[9, 13,16]

Among the congenital malformations of the respiratory organs, stenosis of the main bronchus is one of the rarest. There is a single piece of information about this pathology in the literature, but we have not found any specific description. Therefore, our observation should be of some interest to surgeons.

Patient A., 12 years old, was admitted on September 10, 2016 to the department of elective surgery of the Tashkent Medical Pediatric Institute Clinic with complaints of wheezing, coughing with sputum, and shortness of breath with little physical exertion.

He was born full-term and suffered bronchopneumonia at 10 months. Subsequently, frequent respiratory diseases were noted. At the age of 1.5, he was diagnosed with asthmatic

bronchitis, then bronchial asthma. It was only in 2016 that the left main bronchial stenosis was revealed for the first time during a bronchoscopy at the TashPMI clinic.

Upon admission, the condition is of moderate severity. Nutrition is reduced, there is a significant lag in physical development, and body weight is 24 kg. Chest: the left half is somewhat reduced in size and lags behind in the act of breathing. Breathing 30 times a minute, hard, shallow, small, bubbly wheezes are heard in the lower posterior parts. On the right, breathing is vesicular. Heart tones are muted, 86 beats per minute. The belly is soft and painless. Stool and diuresis are adequate.

On the chest X-ray from September 12, 2016 (Fig. 1a), against the background of uneven pneumatization, there is an increase in the pulmonary pattern, the roots of the lungs are poorly structured, and on the left, there is a narrowing of the pulmonary field. Fibrotracheobronchoscopy (Fig. 1b) from 09/15/2009: patency of the trachea; the tracheal bifurcation is not pronounced. On the right, the main bronchus usually departs. On the left mucosa, the phenomenon of atrophic erosive fibrinous endobronchitis with moderate bleeding Retreating from the bifurcation of 2 cm, the left main bronchus is circularly and sharply narrowed (Fig. 2 cm), and with some difficulty, an intubation tube with a diameter of 3.0 mm passes into it. Moderate subclerotic deformities of segmental and subsegmental bronchi are visible.

On the bronchogram (Fig. 3b), a circular narrowing of the left main bronchus to 3 mm is determined directly at the place of departure of 2 cm from the trachea, uneven filling of the bronchi, some deformation and convergence of the bronchi, and a cystically altered lower lobe on the left.

An ECG recorded a sinus rhythm with a heart rate of 97 beats per minute. The electric axis is not deflected. The syndrome of early ventricular repolarization was revealed.

The function of external respiration (FVD): the body is normal, bronchial resistance is reduced. An obstructive type of FVD violation has been established.

Diagnosis: Congenital malformations of the bronchopulmonary system, congenital stenosis of the left main bronchus, complicated by chronic pneumonia. Lag in physical development. On September 14, 2016, an operation was performed after preliminary preoperative preparation: a thoracotomy for the resection of the stenotic section of the left main bronchus. Under endotracheal anesthesia, a posterolateral thoracotomy was performed on the left in the V intercostal space. The lung is rigid, there are many enlarged lymph nodes in the root area, and there are no adhesions. The main bronchus has been activated. A short, circular stenosed area was found. After applying two holders, the bronchus is crossed distally to the stenosis. The lumen of the narrowed area is 3 mm, and the length is 2 mm. Suction of mucus from the bronchi was carried out. After that, the stenotic area is excised. Bronchial anastomosis was applied end-to-end with nodular sutures with vicryl (first sutures on the anterior, then on the posterior wall). The check for aerostasis showed an absence of blowing. Rare stitches were applied to the dissected pleura. The transition to double-pulmonary anesthesia with an inflated lung was carried out. The lung is ventilated, but sluggishly, and areas of atelectasis in the lower lobe are eliminated with some difficulty. Sutures were applied to the wound layer by layer, leaving Bulau's drainage. For 4 days, the patient was in the intensive care unit; he received antibiotic therapy, UHF on the chest, inhalations, etc. Drainage was removed after 2 days. The postoperative course is uneventful; wound healing is accomplished through primary tension.

On the control radiograph from May 19, 2016, there is some hypoventilation of the lower lobe of the left lung (Fig. 2a).

On fibrotracheobronchoscopy from September 20, 2016, the patency of the trachea was established, but the tracheal bifurcation was not pronounced. A tube with a diameter of 9 mm passes through the anastomosis zone. Segmental and subsegmental bronchi are narrowed and deformed. Moderate sclerotic deformations of segmental and subsegmental bronchi are visible, and purulent sputum is released in large quantities from the lower lobe bronchus. On the left mucosa, the phenomenon of atrophic erosive-purulent endobronchitis with moderate bleeding TBD was sanitized and lavaged with mucolytics, antiseptics, and antibiotics.
On the bronchography of September 23, 2016 (Fig. 2b), the anastomosis zone is passable, and the sharply deformed subsegmental bronchi of the lower lobe, ending in blind sac formations, are brought together. On the right, without features.

Angiopulmonography: the lower lobe branches of the pulmonary artery on the left are thinned, blood flow through them is accelerated, and there is no contrast of the capillary phase. The pressure in the pulmonary artery is within normal limits.
Clinical diagnosis: bronchiectasis of the lower lobe of the left lung on the basis of bronchial malformation, postoperative resection of the stenosed part of the left main bronchus with end-to-end anastomosis, purulent endobronchitis.

Concomitant diagnosis: hypoplasia of the right kidney.

After a consultation with the doctors, an operation was recommended—a thoracotomy, intraoperative filling of the lower lobe of the left lung.

On October 2, 2016, a thoracotomy and filling of the lower lobe of the left lung were performed.

Under endotracheal anesthesia, a postoperative scar was excised, and the left pleural cavity in the VI intercostal space was opened in layers. The interpleural junctions are loose, separated by a blunt and acute path. The lower lobe is atelectated; segments VI and VII remain aerated. The inferior lobe vein was isolated along the interlobular gap and taken to the turnstile. The posterior mediastinal pleura was dissected, and the inferior lobe bronchus was isolated and expanded with peribronchial sclerosis and adhesions. The latter are dissected, and the bronchus is skeletonized. At the same time, it was found that the bronchus of the VI segment departs by 0.3–0.4 cm below the discharge of the upper lobe bronchus. In this regard, the bronchus of the VI segment is separately stitched, ligated, and cut off. The proximal stump is treated and sutured with double-row stitches. A cannula was inserted into the distal stump, the bronchus was sanitized, and the airiness of the parenchyma of the basal segments was restored when blowing. The basal segments were sealed. The last segments are inflated to a physiological volume: 2.0 g of biopolymer in 40.0 ml of physiological solution was injected through the cannula, along with 1.0 g of medoceph. The stump of the bronchus is hermetically sutured. The integrity of the posterior mediastinal pleura has been restored. Several notches up to 2.0–2.5 cm long and up to 0.2–0.3 cm deep were made on the lingual segment and the lower lobe along the interlobular surface. A piece of the lung was taken for histological examination. The upper and lower lobes are sewn together. Hemostasis. The upper lobe is well-ventilated. The pleural cavity is washed and drained. Layer-by-layer stitches on the wound.

Postoperative diagnosis: Malformations of the bronchopulmonary system, hypoplastic bronchiectasis of the lower lobe of the left lung. The condition after surgery is resection of the stenosed part of the left main bronchus with an end-to-end anastomosis.
The patient was in the intensive care unit for 2 days, received antibiotic therapy, bronchodilators,

bronchoaseptics, heparin therapy (100 units/kg / day), physiotherapy procedures, etc. Pleural active aspiration at 2-4 cm H2O pressure. Drainage was removed after 2 days. The postoperative course is uneventful; wound healing is accomplished through primary tension. On the control radiograph from October 9, 2016, there is partial atelectasis of the sealed part of the left lung.

Pathohistological conclusion: hypoplastic bronchiectasis with preservation of respiratory departments Chronic pneumonia.

On October 10, 2016, he was discharged with recovery, 8 days after the operation. Control after 1 and 6 months—he is healthy, there have been no exacerbations of pneumonia.

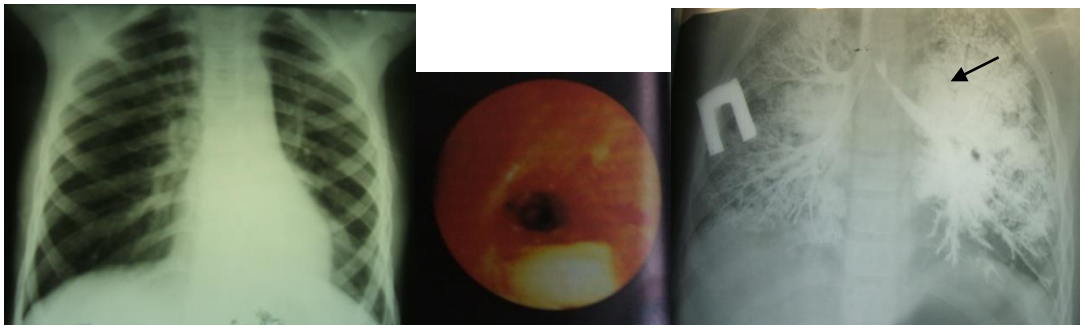
On the chest X-ray of April 15, 2017 (Fig. 3a), the roots of the lungs are strengthened, and the airiness is preserved in the projection of the lower lobe of the left lung.

On bronchoscopy from April 16, 2017: the anastomosis is passed, there is no stenosis, endobronchitis is not pronounced, the stump of the lower lobe bronchus is 0.3 cm, the bronchial mucosa on the left is somewhat atrophic, and there is no pus.

On the bronchography of April 16, 2017 (Fig. 3b), the anastomosis zone is passable, uniform filling of the bronchi of the upper lobe of the left lung, and on the right, there are no features.

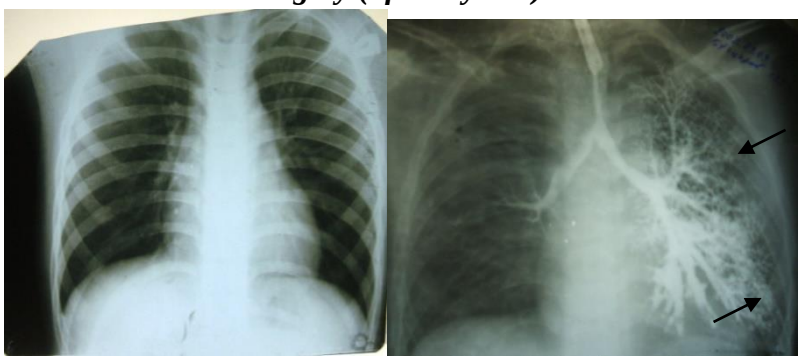
The angiopulmonogram of 18.04.2017 (Fig. 3b) revealed a slight deformation of the vascular pattern of the lower lobe, there is no capillary phase, the pressure in the pulmonary artery is within normal limits (pulmonary artery pressure 25/5, average 15 mmHg, total pulmonary resistance 265 din. see c-5, Qmcc – 3.6 l/min, Oeff – 3.05 l/min). In the study of the gas composition of blood, RaO2 is 96 mmHg, Ra CO2 is 38.5 mmHg, and pH is 7.43.

Figure 1. Overview radiograph (a), fibrotracheobronchoscopy data (b), and bronchogram (c) before surgery: stenosis of the left main bronchus of patient A., 12 years old.



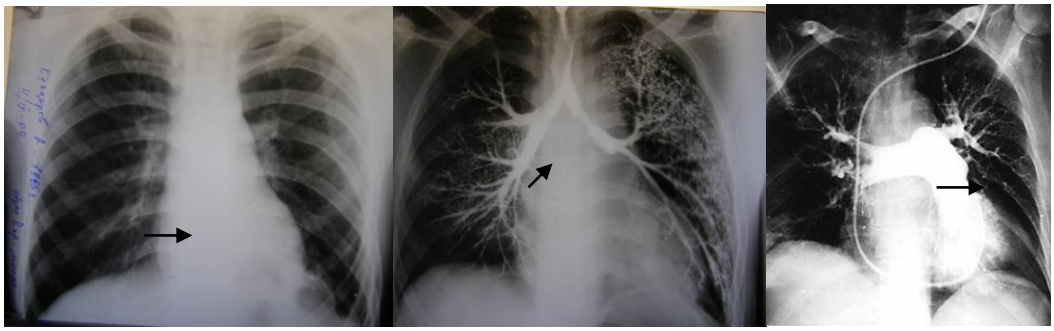
a ***b*** ***c***

Figure 2. Overview radiograph (a) and bronchogram (b) of the same patient after rhinoplasty surgery (after 5 years).



a b

Figure 3. Overview radiograph (a), bronchogram (b), and angiopulmonogram (c) of the same patient after bronchoplasty surgery (after 5 years) and lower lobe filling (after a year).



a ***b*** ***c***

Histological examination: the ciliated epithelium is replaced by a cubic one; there is extensive erosion of the mucosa, defects of the basement membrane are determined. There is no cartilaginous plate at the site of stenosis; hyperplasia of bundles of myoblasts and fibrocytes is visible.

Control at 1, 5, 12, and 5 years—healthy; no pneumonia exacerbation. The last bronchoscopy was on June 16, 2020: the anastomosis is passable; there is no stenosis; endobronchitis is not pronounced; the bronchial mucosa on the left is somewhat atrophic; there is no pus.

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