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**CLINICAL CASE DI GEORDGI`S SYNDROME**

Ganna Senatorova, Margaryta Gonchar, Olga Logvinova, Marina Strelkova.

Department of Pediatrics №1 and Neonatology of the Kharkiv National Medical University.

Kharkiv, Ukraine

**Resume:** this article presents a clinical case of Di Giorgi syndrome. Details are set out especially the disease, diagnostic search, tactics of treatment at the hospital stage, and recommendations for further treatment at home.

**Keywords:** Di Giorgi's syndrome, primary immunodeficiency, children, treatment.

**Резюме:** в статье освещен клинический случай синдрома Ди-Джорджи. Подробно изложены особенности течения заболевания, диагностический поиск, тактика лечения на госпитальном этапе и рекомендации по дальнейшему лечению в домашних условиях.

**Ключевые слова:** синдром Ди-Джорджи, первичный иммунодефицит, дети, лечение.

**Резюме:** в статті висвітлено клінічний випадок синдрому Ді-Джорджі. Детально викладені особливості перебігу захворювання, діагностичний пошук, тактика лікування на госпітальному етапі та рекомендації щодо подальшого лікування вдома.

**Ключові слова:** синдром Ді-Джорджі, первинний імунодефіцит, діти, лікування.

Boy T, 1.5 months is taken to the Intensive Therapy Unit in serious condition, due to cardio-respiratory failure, intubated with ortho-tracheal tube, [independen](http://www.lingvo.ua/ru/Search/Translate/GlossaryItemExtraInfo?text=самостоятельный&translation=independent&srcLang=ru&destLang=en)t breathing is not effective.

From the history of life and the disease it is known that the child is from 4th pregnancy, 2nd independent labour in 38 weeks gestation. During this pregnancy, the mother suffered the threat pf premature birth at 24th week, SARS at the 26th week, from the 34th week-asymptomatic bacteriuria. According to the ultrasound screening: in the period of gestation — 11-12 weeks are without pathology; 25th-26th weeks are without pathology; at the 34th week fetus has ecoshopy signs of Multiple congential malgormations (dilation of the right [compartment of heart](http://engperevod.ru/engtorus/compartment%20of%20heart) and the pulmonary artery, the expansion of the cavity of pellucid septum till 9mm). The hypoplasia or agenesis of the corpus collosum can not be excluded, hypoplasia of the vermis cerebelli, varus setting of right roop, hydrocele, the single umbilical artery. Hypoplasia of placenta, polyhydramnios.

Pedigree is burdened by multifactorial diseases: the child's mother (34 years) - a chronic pyelonephritis in remission, phlebeurysm. Father (34 years) are healthy. Brother (7 years) and sister (9 years) are healthy.

At birth: weight — 3150 gr, height - 53 cm, head circumference — 34 cm, chest girth — 34 cm, Apgar score: 1 min — 7 b (2-2-1-1-1) 5 min - 8 b (2-2-1-1-2).

One day after the birth, with the aim of operative treatment of prenatal diagnosed сongenital heart defect, the child was transferred to the departments of the Cardiological Surgery. On the third day of life  operative therapy was carried out: expanding plastic of the aortic arch, resection of the aortarctia, patent ductus arteriosus ligation, opened sternum. On the fourth day of life the ehabilitation of the pleural cavity and the reduction of the sternum was carried out.

After 8 days after the operative therapy the child was transferred to the perinatal center, where he had anapnotherapy because of the lack of independent breathing.

The diagnosis during carrying out: the syndrome of hypoplasia of the left ventricle, [aortic valve](http://universal_ru_en.academic.ru/53241/aortic_valve), hypoplasia of the aortic arch. Secondary atrial septal defect, patent ductus arteriosus. Di George's syndrome?

Treatment: OPC mode, ventilation Aveo in A/C Mode. Feeding through a enteric feeding tube, furosemide, veroshpiron, kaptopril, antibacterial, fungicide and immunoreplacement therapy. Feet bandaging with the aim of congenital clubfoot.

The condition of the child remained severe because of expressed evident signs of ardio-respiratory failure, no effective independent breathing. For the further observation the child is in the multidisciplinary hospital.

During admission: clear conscience. The skin is pale, venous network is visiable, the subcutaneous fat layeris not developed enough, there are signs of allostose dysplasia (hypermobility of the joints, hyperstretchability of the skin, the varus setting of feet), the [hydrocele](http://www.lingvo.ua/ru/Search/Translate/GlossaryItemExtraInfo?text=гидроцеле&translation=hydrocele&srcLang=ru&destLang=en) on the right side. Mucous are pink, visuable. Normal body temperature. HR - 160 per minute. BP — 80/60 mm Hg. SpO2 — 99%. Mass - 3950 g; growth - 54.8 cm; head circumference — 36,5 cm, chest girth — 35,3 cm.

Intubated with ortho-tracheal tube, breathing — harsh, wheezing is not heard. Heart's toneas are rhythmic. The abdomen is soft, deep palpation is available in all departments. The liver is enlarged till 3 cm below the costal margin, the spleen +2 cm  [below the costal margin. Physiological](http://bizgid.kz/postal/region_16.html) dejection is not interrupted.

The diagnosis at admission: Di George's syndrome. Multiple congential malgormations. сongenital heart defect: hypoplasia of the left ventricle, hypoplasia of the aortic arch, aorta angusta, patent ductus arteriosus. The condition is after surgery. surgical correction. Secondary atrial septal defect. Cardiomegaly. Aplasia of the thymus. Сongenital malformation ot the urinary system: hydronephrosis 4th st. left-side. Congenital right-side clubfoot. Pneumonia with confluent foci. Laboratory and instrumental survey and the specialty consultations were realized:

Blood count:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The day in the station /№ | Hb | RBC | Reticuocytes | Platelets | WBC | [basophils](https://en.wikipedia.org/wiki/Basophil_granulocyte) | [eosinophils](https://en.wikipedia.org/wiki/Eosinophil_granulocyte) | [granulocytes](https://en.wikipedia.org/wiki/Granulocyte) |  [lymphocytes](https://en.wikipedia.org/wiki/Lymphocyte%22%20%5Co%20%22Lymphocyte) | [monocytes](https://en.wikipedia.org/wiki/Basophil_granulocyte) |
| 2nd/1 | 79 | 2,8 | 0,87% | 146 | 4,6 |  | 1 | 55 | 36 | 8 |
| 4th/2 | 93 | 3,2 | 0,87% | 139 | 6,7 |  | 2 | 70 | 17 | 10 |
| 9th/3 | 74 | 2,6 | 0,5% |  | 4,3 |  | 1 | 60 | 31 | 8 |
| 13th/4 | 125 | 4,1 | 0,9% | 213 | 8,6 |  | 1 | 65 | 25 | 9 |
| 17th/5 | 97 | 3,3 | 0,89% | 165 | 8,2 | 1 | 1 | 44 | 52 | 2 |
| 13th/6 | 111 | 3,7 | 2,0% | 274 | 5,8 |  | 1 | 72 | 23 | 1 |

Clinical urine analysis:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| The day in the station /№ | Quantity | Color | CLA | SG | Protein | RBC | WBC |
| 2nd/1 | 10,0 | Yellow | Bland | - | None | 1-2  | 1-3  |
| 4th/2 | 14,0 | Yellow | Bland | - | None | 1-2 | 1-3  |
| 9th/3 | 10,0 | Yellow | Bland | - | None | 1-2  | 1-3  |
| 13th/4 | 7,0 | Yellow | Bland | - | None | 1-2  | 1-2  |
| 23th /5 | 50 | Light yellow | Bland | 1,006 | None | Changed | 2-4  |

* L[iver function tests](http://universal_ru_en.academic.ru/349006/liver_function_tests) - ALT (N 0.14) - 0.07 mkkat/l; AST (N 0.14) - 0,083mkat/l; B-lipoproteins - 34; Cholesterol - 2,49mmol / l; thymol test - 1.0; alkaline phosphatase - 5600 U / l; total bilirubin - 9,9 mkmol / l; direct - 3.3 mmol/l; indirect - 6.6 mol/l.

- Sputum analysis:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| The day in the station /№ | Color | Culture | WBC | RBC | Epithelium. | Other | Mycobacterium tuberculosis |
| 11th/1 | White | Mucopurulent | 10-15  | 1-3  | Squamose 2-4  | None | None |
| 15th/2(bronchoscopy) | Light white | Purulent | 40-50 |  2-4  | Squamose 1-2  | Fungusa little | None |

 - Immunogram:

|  |  |  |
| --- | --- | --- |
| The day in the station /№ | 6th day /1 | Norm |
| Leukocytes 109/l  | 10,1 | 10,3-11 |
| Lymphocytes,% | 14 | 52-69 |
| absolute number, 109/l | 1,42 | 5,4-7,59 |
| Т Lymphocytes (СD3),% | 63 | 58-67 |
| absolute number, 109/l | 0,89 | 1,7-3,6 |
| В Lymphocytes. (СD22),%  | 22 | 19-31 |
| absolute number, 109/лl | 0,31 | 0,5-1,5 |
| СD4 | 45 | 38-50 |
| СD8 | 19 | 18-25 |
| СD4/ СD8 | 2,37 | 1,5-2,9 |
| СD16 | 13 | 8-15 |
| IgA, g/l | 0,57 | 0,21±0,13 |
| IgM, g/l | 0,47 | 0,30±0,11 |
| IgG, g/l | 9,9 | 4,30±1,19 |
| % neutrophils phagocytose | 53 | 40-90 |
| Phagocytes, number. | 1,43 | 1-2 |
| НСТ-test  | 31 | 8-12 |
| Compliment СН50 | 42 | 40-80 |

* Bacteriological inoculation from the mouth: fourfold –

 К. Pneumonia 107, P. Aeroginosa – 103;

 К. Pneumonia 106, P. Aeroginosa – 106;

 К. Pneumonia 104, P. Aeroginosa – 107;

 К. Pneumonia 105, P. Aeroginosa – 107.

- С[hest X-ray](http://universal_ru_en.academic.ru/304477/chest_X-ray) in the first day – bipartite, upper lobe pneumonia with confluent foci. On the 13th day – negative dynamics in the form of atelectasis of the upper lobe of the right lung (the development of segmentary pneumonia is possible). On the 17th day positive dynamics in the form of recovery of pneumatization of lung fields.

- Echocardiography:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| The day in the station/№ | 1st day/1 | 8th day2 | 14th day/3 | 21st day/4 | 25th day/ |
| EDD | 14,3 | 17,7 | 15,5 | 17,4 | 15,7 |
| ESD | 6,1 | 8,8 | 19,2 |  | 6,8 |
| Vd | 5,3 | 9,3 | 5,7 |  | 6,8 |
| Vc | 0,5 | 1,5 | 1,6 |  | 0,7 |
| Stroke volume | 4,8 | 7,8 | 4,0 |  | 6,1 |
| EF | 90 | 84 | 71 | 89 | 88 |
| Δ D | 0,58 | 0,50 | 0,37 |  | 0,56 |
| d LA |  |  | 21,0х15,0 | 12,0 | 17,9 |
| d RV | 18,6 | 15,0 | 20,5 | 19,9 | 17,9 |
| d RA |  |  | 19,0х17,0 | 17,1 |  |
| ΔР AV | 9,4 | 13,4 | 12,4 | 11,5 | 10,0 |
| ΔР desc. Ао | 15,4 | 28,5 | 19,8 | 14,7 | 15,1 |
| ΔР АoV | 9,3 | 10,9 | 3,8 |  | 3,9 |
| ΔР МV | 6,5 | 6,5 | 3,9 |  | 4,01 |
| ΔР ТV |  | 4,5 | 5,1 | 5,7 | 5,1 |
| Medium pressure in PA |  | 47,0 | 34 | 31 | 34 |
| d of aorta  | 7,5 |  |  |  |  |
| d aortic arch | 15,5 |  |  |  |  |
| d abdominal. Ао | 5,8 |  |  |  |  |
| Blood flow in the abdominal aorta | pulsatile, с V max2 55 см/с | Pulsatile, с V max2 58,5 см/с | pulsatile |  | pulsatile |
| Regurgitation |  | І grade |  | І grade | І grade |

* Ultrasound of kidneys and bladder: renal hydronephrosis of left kidney.
* Ultrasound: the thymus is not visualized.

- Electrocardiography (ECG). On the 2nd day – severe sinus tachycardia. Slowing [atrioventricular](http://universal_ru_en.academic.ru/295490/atrioventricular) conduction, right front leg of Hiss beam has incomplete block. Hypertrophy of the right atrium and right ventricle. Repolyarizatsionnye violations. Overload of the left atrium and the right ventricle and processes of repolarization became bigger in dynamic.

- Neurosonography (for Vatolin): the asymmetry of the lateral ventricles. CSF hypertension, outer shape.

- Consultation of immunologist: aplasia of the thymus, immunological deficiency on cell type, Di George's syndrome. Holding of thoracic organs CT scan is recommended to rule out malformations of bronchopulmonary system (polycystic hypoplasia) and Mikita Wilson syndrome.

- Consultation of haematologist: anemia, thrombocytopenia, leukopenia and it is necessary to exclude the development of secondary aplastic anemia. When you save changes to the clinical blood test to conduct myelogram.

- Consultation of the neurologist: hypoxic-ischemic lesion of central nervous system (perinatally-somatogenic genesis), asthenic syndrome.

Treatment: Open resuscitation system mode, ventilation Aveo in SIMV mode. Feeding through a enteric feeding tube, furosemide, sibazon, armadin prednisolone. Antibacterial and antifungal therapy. Inhalation therapy: Pulmicort, ventalin, Lasolvan. Per os: piobakteriofag, sildenafil, captopril, eroton, hydrochlorothiazide, veroshpiron, bio-gaya, laferobion, Tobrex, caffeine-sodium benzoate (at the time of weaning from oxygen), pancreatin. Bandaging of feet to correct a congenital clubfoot.

From the 7th day of hospitalization low-grade fever appeared (37,3-37,5 °C), and from the 10th the fever on the febrile figures appeared (38,3-38,5 °C), periodically bouts of bronchospasm. Diagnosis was made: secondary bilateral focal pneumonia, respiratory insufficiency of the II degree. From the 13th day of hospitalization negative dynamics during the pneumonic process (in the form of atelectasis of the upper lobe of the right lung, and possibly the development of segmental pneumonia). Positive dynamics was reached till 15th day.

By day 22, the child was transferred to spontaneous breathing, till 24th day he was fed naturally (mother’s breast at the request).

***Final diagnosis. Multiple congenital malformations: congenital heart disease (hypoplasia of the aortic arch, opened arterial ductus (the state is after the correction - expanding plastic of the aorta, aortic coarctation resection, ligation of patent ductus arteriosus), secondary atrial septal defect 2A circulatory failure.). Congenital urinary tract pathology (hydronephrosis transformation of the left kidney of the 2nd grade, the edema of the testicles). Di George's syndrome (aplasia of the thymus, immune deficiency on cell type). The secondary chronic obstructive pyelonephritis, remission period. Interstitial lung disease (fibrosis), high pulmonary hypertension, respiratory failure of the 2nd grade. Right-sided pneumonia of the 2nd grade. Congenital sided clubfoot. Tonicity and movement disorders as a consequence of hypoxic-ischemic central nervous systems syndrome. Hypotrophy of the 2nd grade. Anemia, thrombocytopenia.***

Till the time of discharge (27th day of hospitalization) the child's condition is stable.

Recommendations: diet according to the age. Eroton 7.5 mg 3 times per day; hydrochlorothiazide 4 mg x 2 times a day; veroshpiron 7.5 mg x 2 times a day; Captopril 1.4 mg x 2 times a day; Pulmicort 125 mcg x 2 times a day for a month. Follow-up care in the hospital.

Literary reference

 **Di George's syndrome** - is a primary immunodeficiency characterized by aplasia or hypoplasia of the thymus and parathyroid glands, congenital heart defects, facial malformations. Also, the disease may be accompanied by other developmental anomalies (anomalies of the skeleton, kidneys, nervous system, eye disorders).

In the absence or, which occurs more often, reducing the size of the thymus T lymphocytes do not develop properly. Because of this, the immune system can not perform its protective function in full. However, the "full" Di George's syndrome with severe abnormalities of the immune system is extremely rare. Due to the variety of symptoms, these patients can be checked up by physicians of different specialties [1].

**Symptoms**. Males and females sick with the same frequency.

The frequent occurrence of viral, fungal and bacterial infections, poorly amenable to standard therapy - antibiotics, antivirals, antifungals.

Congenital heart defects (up to tetralogy of Fallot - stenosis of the right ventricular outflow part, high ventricular septal defect, dekstraposition of aorta, right ventricular hypertrophy). Convulsions (arise from the malfunctioning of the parathyroid glands) [2]. Abnormalities of the facial skeleton: microcephaly (reducing the size of the skull bones); hypertelorism (widely spaced eyes); small, deformed, low-lying ears; availability epikanta (vertical folds of skin of crescent shape covering the inner canthus); cleft lip and palate; "Gothic palate" (high palate); micrognathia (underdevelopment of the jaw bones); strabismus (squint); palpebral (eye shape, in which the outer corners of the eyeballs are lowered).

Abnormalities of the larynx, pharynx, trachea, inner ear, esophagus (stenosis, shortening) [3].

Abnormalities of the central nervous system: cortical atrophy (loss of many motor and sensory functions), hypoplasia (incoordination) of the cerebellum.

Abnormalities of the gastrointestinal tract: atresia of the anus, anal fistula.

Pathology of the eyes: dysgenesis of the front, coloboma (a defect of one of the components of the eyeball (iris, lens, etc.), in which some components are missing), retinal vascular anomaly (as a result, the violation of the feeding of retina). Anomalies of development of kidneys: hydronephrosis, renal atrophy, reflux.

Anomalies of teeth: delayed eruption, enamel hypoplasia, dental caries.

The anomalies of the skeleton: polydactyly, no nails, spontaneous bone fractures.

Backlog in intellectual development. The lag in motor development [4].

**Causes**. The cause of the Di George's syndrome is a deletion of the 22nd chromosome. Possible risk factors for the appearance of deletions are maternal diabetes, alcohol consumption during pregnancy, viral diseases in the first trimester of pregnancy.

There is evidence when the 22nd chromosome is damaged, it can be inherited in an autosomal dominant manner, that is, the disease is transmitted to humans from one of the parents [5].

**Diagnostics**. Analysis of medical history and complaints - complaints (according to parents) of a child behind in intellectual development; caries; fractures; heart problems; often recurrent bacterial, viral and fungal diseases that are difficult to treat.

Analysis of the history of life - the lag in growth and development of the child; presence of heart defects, whether the operation in this regard, the presence of strabismus, whether the operation in this regard; frequent bacterial, viral and fungal infections.

patient examination - the doctor can see the following picture: decrease of the patient's head, hypertelorism (widely spaced eyes), small, deformed, low-lying ears, presence epikanta (vertical folds of skin crescent-shaped, covering the inner canthus), cleft lip and palate, "Gothic palate", micrognathia (underdevelopment of the jaw bones), strabismus (crossed eyes), palpebral (eye shape, in which the outer corners of the eyeballs are lowered). Auscultation (listening to) the heart can hear specific sounds that are typical congenital malformations of the cardiovascular system.

Immune status - is determined by reducing the number of T lymphocytes can be detected reduction of serum immunoglobulins.

Common blood - lymphopenia.

Biochemical analysis of blood - decrease in the level of calcium, hypocalcemia (the analysis is repeated several times to ensure that the persistent presence of this condition).

Ultrasonography (ultrasound) of the parathyroid glands and thymus (thymus) - revealed their absence or reduction.

Echocardiography (echocardiography) Heart - identifying defects of the cardiovascular system.

Fluorescent DNA hybridization - reveals a deletion of 22 chromosome characteristic of the Di George's syndrome [6].

**Treatment of the Di George's syndrome**. Antibiotics are prescribed in the event of a bacterial infection in the body. Antivirals - in case of a viral infection. Antifungal drugs - with a fungal infection. Replacement therapy with intravenous immunoglobulins derived from the plasma of healthy donors, which applies in the case of reducing the level of immunoglobulins. Calcium supplementation in order to increase its level.

Surgical treatment - removal of congenital malformations of the cardiovascular system.

Transplantation of fetal thymus without prior surgical correction of congenital heart disease is considered to be inefficient, only carried out at the "full" syndrome Di George (when there is a marked immunological disorders - severe immunodeficiency).

**Complications and consequences**. A significant backlog in intellectual development.

The development of autoimmune diseases (for these diseases are characterized by aggression of the immune system against its own organism: the immune system takes over its foreign cells and attacks them). The development of neoplastic disease at an early age.

Deaths from infectious complications or malformations of the cardiovascular system are not compatible with life, endocrine disorders (dysfunction of the parathyroid glands).

**Prediction** usually depends on the severity of cardiac and endocrine defects, "full" syndrome - from immunology - the absence of T-lymphocytes, reducing the production of antibodies - immunoglobulins.

**Prevention**. Patients with partial immune disorders can be administered prophylactic antibiotic and antifungal therapy.

It is necessary to eliminate the use of alcohol during the mother's pregnancy.

Prior to pregnancy, the mother is necessary to make the appropriate anti-viral vaccines (eg, measles and rubella virus).

If a pregnant woman during a routine screening (ultrasound examination of the fetus and the pelvic organs in the 11-13 weeks of pregnancy) for the presence of disease suggest the possible presence of a child the Di George's syndrome, she offered to pass additional tests - amniocentesis (obtaining amniotic fluid) in order to analysis of fetal DNA for chromosomal abnormalities (deletions (loss portion) of the 22nd chromosome) [7].

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