

ERB-DUCHENNE PALSY (CASE REPORT)

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The frequency of damage to the brachial plexus is 0.5–2 per 1000 live births. Most of them (about 90 % cases) are Erb-Duchenne palsy. Birth trauma of the brachial plexus occurs mainly in full-term newborns. Correct diagnosis of Erb-Duchenne palsy allows to avoid long-term complications as late treatment leads to disability. The article presents a clinical observation of Erb-Duchenne palsy in a newborn patient, who was diagnosed on the first day of life. Conservative therapy was an effective strategy of baby's recovery.

Key words: *Erb-Duchenne palsy, birth injury, brachial plexus, newborn.*

The neonatal period of a child's life is the most important stage of human ontogeny, during which the formation and rapid development of all functional systems of the organism occur. The period of newborn is highlighted due to the special dynamism of the process of postnatal adaptation, and the greatest risk of disruption of this adaptation, much higher rates of morbidity and mortality. In our country in recent decades, research in neonatology has become important due to the fact that at the present time the critical features of the neonatal ontogenesis are combined with extremely unfavorable social, biological and environmental factors, as well as with a severe demographic situation - the decline in fertility, short life expectancy and as a result a decrease in the population of Ukraine.

Erb-Duchenne palsy. ICD-10 / P00–P96 CLASS XVI Individual conditions originating in the perinatal period / P10–P15 Birth injury / P14 Birth injury of the peripheral nervous system.

P14.0 *Erb-Duchenne* palsy with birth injury

P14.1 Klumpke palsy with birth injury

P14.2 Diaphragmatic nerve palsy with birth injury

P14.3 Other birth injuries of the brachial plexus

P14.8 Birth injuries of other parts of the peripheral nervous system

P14.9 Birth injury of peripheral nerves, "unspecified"

The proximal (upper) type, or *Erb-Duchenne* palsy (P14.0) (damage to rootlets from C5–C6 segments) is the most common type of palsy [1]. The following nerves and muscles are usually involved in the pathological process: n.axillaris (m.deltoideus), n.musculocutaneus (m.biceps et brachialis), n.radialis (m.brachioradialis et m.supinator brevis), n.suprascapularis (m.infraspinalis) [2]. This leads to atrophy of the shoulder muscles and forearm and to impossibility of lifting the shoulder to the horizontal line, flexing the forearm, supination of the forearm and hand. The affected limb hangs drowsily along the torso and is rotated somewhat inward, as a result of which there is a Novik's symptom ("puppet hands"). The head is inclined to the lowered paretic shoulder, the hand is in the position of palmar flexion. Reflexes from the biceps are not caused. The paretic limb does not participate in the Moro reflex, grasping reflex is partially preserved. Muscle strength is reduced. There are no tendon reflexes with m. biceps, m. brachioradialis and m. triceps [3]. With a severe form of the paresis, a subluxation or dislocation of the head of the humerus can be observed due to a sharp decrease in muscle tone that fixes the shoulder joint. There is a symptom of Fink's "click". Sensitivity in the deltoid region is impaired. In 5% of cases, C3–C4 rootlets are involved in the pathological process, which is accompanied by damage of the diaphragmatic nerve. In such cases, in addition to limb palsy, respiratory

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disorders (rapid breathing, cyanosis, hiccough, dyspnea) are observed, especially with anxiety and screaming [4].

Along with Erb-Duchenne palsy, the distal lower Dejerine-Clumpke palsy, caused by the injury of the lower parts of the brachial plexus (C8-Th1) and total palsy of Kerer (C5-Th1 damage level) [5]. Duchesne-Erb palsy occurs more frequently in comparison with other diseases; in obstetrical practice its frequency is 1–2 cases per thousand newborns. Despite the developed methods of diagnosis and treatment, this pathology continues to be an urgent problem for a number of medical disciplines (neurology, orthopedics and traumatology, pediatrics, neonatology, obstetrics and gynecology).

The condition is mainly observed in full-term newborns. The frequency of damages of the brachial plexus is 0.5–2 per 1000 live births; among them, 90% of cases are Erb-Duchenne palsy [6].

The leading mechanism of the disease is stretching of the brachial plexus and neural roots, which form it and are fixed in the cervical spinal cord, due to excessive lateral (side) traction [7]. Thus, tractions and turn over the shoulder during the eruption of the head in case of breech presentation is a main cause of Erb-Duchenne palsy.

The upper roots of the plexus are most vulnerable, and as a result of excessive traction they are more often damaged. In severe cases of damage, detachment of the roots from the spinal cord, which can be accompanied by damage to the spinal cord itself, is present.

With less severe injury, hemorrhage and edema are observed in combination with rupture of the rootlets covers [8].

Important factors are maternal diabetes,

excessive weight gain during pregnancy, which lead to embryonic macrosomia, which increases the risk of injury during childbirth.

It is not necessary to exclude the role of non-coordinated childbirth and rapid childbirth in the development of this pathology. It should be clarified that childbirth by caesarean section reduces, but does not completely eliminate the risk [9].

According to some sources, congenital varicella syndrome, as well as osteomyelitis of the head of the humerus or cervical vertebrae (due to plexus ischemia) can lead to complete palsy of the brachial plexus [10].

CLINICAL CASE

A child from the first pregnancy against a background of chronic tonsillopharyngitis in remission, anemia of mild degree from week 32. Baby from the first delivery at the gestational age of 39 weeks. The amniotic fluid was clear. Apgar score: at 1 minute – 6 points, at 5 min – 8 points.

At birth, the body weight was 3795 g, length 50 cm, head circumference 35 cm, chest circumference 37 cm.

Resuscitation measures were carried out in the hospital: sanitation of the upper respiratory tract, artificial ventilation of the lungs with the Ambu bag. Cardiovascular system of the umbilical cord blood: pH-7,149, PCO₂ – 50 mmHg.

At the initial examination, the limitation of mobility of the left upper limb was revealed (*Fig. 1*).

There was no signs of bone injury on X-ray examination.

Immobilization of the left arm by the outboard tire was made.

For further treatment, he was transferred to specialized department for thick neonates.



Fig. 2. X-ray, made just after the birth (no signs of injury)



Fig. 1. Position of the right arm of newborn baby

Laboratory investigations showed the following:

Complete blood count:

Index	result
Hb	144 g/l
Erythrocytes	4,08x10 ¹² /l
Ht	41%
Platelets	122 g/l
BCI	1,0
Leukocytes	6,6x10 ⁹ /l
Myelocytes	1%
Metamyelocytes	1%
Stabbed	5%
Segmented	27%
Eozinofiles	4%
Lymphocytes	55%
Monocytes	7%

Blood glucose-3,6 mmol / l

Clinical urinalysis:

Index	result
Color	yellow
Transparency	clear
Ph	acidic
Glucose	–
Protein	–
Leukocytes	–

Coprogram

Index	result
Color	Yellow
Neutral fat	Some
Leukocytes	–
Erythrocytes	–

Cranial ultrasound investigation: Echoes of edema of the brain, mainly periventricular zones.

Doppler-echocardiography: Patent foramen ovale, patent ductus arteriosus.

Orthopedic specialist diagnosed left-sided upper monoparesis, pronation-flexion system in the left elbow joint.

Neurologist confirmed the birth injury of the peripheral nervous system, left-sided Erb-Duchenne palsy.

Management. Immobilization of the left arm with an abducting splint, placement in the middle physiological position.

According to modern sources, the initial treatment is conservative. Physiotherapy and exercises with passive movements are indicated to prevent contractures (they can be started at the age of 7–10 days, after the extinction of post-injury neuritis). It is necessary to avoid the position of the "Statue of Liberty", as this leads to the development of contractures in the immobile shoulder. It can be helpful to overlay the longes on the wrist and fingers [6].

If the child does not noticeably improve the functionality of the affected arm in the first six months, surgical correction is usually recommended.

The prognosis of full recovery depends on the severity of the damages. If the roots of the nerves are not damaged and not broken, the prognosis is almost good (> 90%). If a significant improvement is observed during the first 2 weeks after birth, this indicates a complete or almost complete restoration of the plexus function. In most children, it is fully restored until the 3rd month of life. With a slow recovery, electromyography and investigation of the conductivity of the nerves make it possible to distinguish from avulsion (separation of the roots of the nerves from the spinal cord) from their stretching [6].

CONCLUSIONS

Erb-Duchenne palsy is a the condition that can be controlled. Its main symptoms in the form of restriction of movements in the shoulder and elbow joints can be minimized if medical aid is sought timely and drift.

Prophylaxis of the genital palsy of Erb is the adequate management of pregnancy and childbirth, the correct choice of the method of childbirth, which makes it possible to avoid the need for obstetric obstetrical manipulations.

Conflict of interests

There is no conflict of interests.

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Received: 22-Apr. - 2018

Accepted: 20-Jun- 2018