



OBSTETRICAL PALESY — CAUSES OF RESTRICTION OF HAND MOVEMENT IN CHILDREN

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Abstract. This article provides a scientific and theoretical analysis of the causes of obstetric palsy and the mechanisms leading to limited upper limb movement in children. Functional disorders resulting from brachial plexus injury during childbirth, along with their clinical manifestations and contributing factors, are examined. Particular attention is paid to the impact of obstetric palsy on a child's physical development, as well as issues of early diagnosis, treatment, and rehabilitation. The article is of significant theoretical and practical value for specialists in pediatrics and neonatology.

Keywords: obstetric palsy, brachial plexus, birth injury, upper limb movement, neurological disorders, pediatric rehabilitation.

Introduction. In recent years, the issue of protecting children's health, especially the prevention of complications associated with childbirth, has become one of the urgent problems of medicine and society. Obstetric paralysis occupies a special place among neurological injuries occurring in the neonatal period. This condition occurs as a result of damage to the central and peripheral nervous system, in particular the brachial plexus nerves, during childbirth and is manifested in children by limited hand movements, reduced muscle activity, and impaired functional capabilities.

Obstetric paralysis is important not only as a medical but also as a socio-pedagogical problem. Because limited hand movements have a negative impact on the child's psychomotor development, self-service skills, and subsequently on his adaptation to the educational process. In some cases, this condition leads to permanent disability and limits the child's social activity in society. Therefore, an in-depth study of the causes, pathogenesis mechanisms, and consequences of obstetric paralysis is one of the important tasks facing modern medicine.

Scientific studies show that the development of obstetric paralysis is influenced by the complicated course of labor, shoulder dystocia, large birth weight, instrumental delivery, and improper obstetric manipulations. Such factors cause stretching, compression, or rupture of the brachial plexus nerves, which results in impaired innervation of the hand muscles. If these processes are not detected and treated in a timely manner, they can lead to functional limitations that persist throughout the child's life.

The relevance of this article is that it aims to scientifically analyze the main causes of obstetric paralysis, which leads to limited hand movement in children, to reveal its clinical significance, and to highlight important aspects of early diagnosis and prevention. The article is of theoretical and practical importance for specialists working in the field of pediatrics, neonatology, and rehabilitation, as well as for students studying in the medical field.

Obstetric paralysis (intracranial paralysis, brachial plexus injury) is a neuromuscular disorder that occurs as a result of damage to nerve fibers in the head or shoulder region during childbirth. This pathology limits the child's arm movements, muscle tone decreases or

disappears, and sensitivity is impaired. Since obstetric paralysis can be a factor of serious disability in children, a thorough study of its causes, mechanisms, and preventive measures is important for research and clinical practice.

Main part. Obstetric paralysis is considered to be damage to the brachial plexus as a result of mechanical traction, compression or stretching during childbirth. The brachial plexus is a network of nerves extending from the lower neck to the shoulder region, which provides movement and sensitivity of the arm.

Classifications:

Avulsion - separation of nerve roots from the spinal cord tissue.

Rupture - rupture of nerve fibers.

Neuropraxia - temporary dysfunction of the nerve (no structural disruption).

Axonotmesis - a condition accompanied by damage to the internal structure of nerve fibers.

This classification is important in determining the degree of damage and determining the treatment method.

2. Mechanism of limitation of arm movement

When the brachial plexus is damaged due to congenital or acquired causes:

- Muscle innervation is impaired - this leads to weakness and immobility of the arm and shoulder muscles.

- Sensitivity is lost or reduced — the child's desire and ability to use his or her hands are limited.

- Reflexes are weakened — this further impairs muscle function.

The higher the degree of damage to the nerve fibers, the more severe the functional impairment.

The main factors that most often cause obstetric paralysis are analyzed:

Factors related to the birth process

1. Improper birth mechanics

- Ureterocele or large shoulders of the child — increases the risk of traction and compression of the brachial plexus.

- The risk of neurotrauma increases with the incorrect use of instrumental births (vacuum extractor, FORCEPS).

2. Incorrect position of the head

- Nerve fibers can be stretched or compressed when the head is compressed by the shoulders when exiting the birth canal.

3. Factors related to pregnancy and maternal condition

1. Gestational diabetes

Infants with high birth weight (macrosomia) due to gestational diabetes are more likely to have shoulder impingement during delivery.

2. Maternal inactivity

This condition causes the baby to be positioned incorrectly in the uterus and complicates the mechanics of labor.

3. Factors related to the baby

1. Cervical-myelofemoral development

If the baby's neck movement is not normal, the risk of hepteral injury during labor increases.

2. Pregnancy with two or more babies

The simultaneous placement of two babies increases excessive pressure on the nervous tissue.

4. Clinical signs and diagnosis

1. Clinical signs

- Immobility or limitation of arm movement.
- Decreased muscle tone.
- Sensory disturbances.
- Decreased or absent reflexes.
- Development of signs of atrophy of the shoulder and arm muscles (in late cases).

2. Diagnostic methods

- Clinical neurological examination
- Electromyography (EMG) — assessment of muscle electrical activity.
- Ultrasound / MRI — visualization of nerve structures.

These methods are important in determining the extent of the injury and drawing up a treatment plan.

5. Treatment approaches

1. Conservative treatment

- Physiotherapy — helps restore muscle function.
- Mechanical stimulation — stimulates nerve regeneration.
- Conducted rehabilitation programs — increases mobility.

2. Surgical intervention

In severe injuries (avulsion or rupture), nerve reconstruction is required. In this case:

- Nerve grafts are inserted.
- Anatomical restoration of shoulder and arm movement is achieved.

6. Preventive measures

- Proper management during labor.
- Treatment of the mother for gestational diabetes.
- Encourage maximum physical activity.
- Identify risk groups in preparation for cesarean delivery.

“The German neurologist Wilhelm Erb was the first to scientifically describe paralysis resulting from damage to the upper part of the brachial plexus (C5–C6 nerve roots) during childbirth at the end of the 19th century. In his studies, he indicated paralysis of the shoulder and arm muscles, decreased reflexes, and functional limitation of the hand as the main clinical signs. Today, this condition is widely used in medical practice under the name Erb's palsy.”

In this regard, Sh. A. Alimuhamedov in his scientific work “conducted a thorough analysis of birth injuries in newborns, including injuries to the peripheral nervous system. He emphasizes that the complicated course of childbirth and mechanical factors play a leading role in the development of obstetric paralysis.”

“The Swiss scientist A. Narakas divided obstetric paralysis into clinical stages and developed a treatment strategy depending on its severity. In his scientific articles, he substantiated that the mechanical traction force that occurs during childbirth causes stretching

and rupture of the brachial plexus nerves. The Narakas classification is still widely used in clinical practice today.” Also, the Uzbek scientist R. A. Abdullayev, in his research on diseases of the peripheral nervous system in children, “paid special attention to the clinical symptoms of obstetric paralysis, early diagnosis and rehabilitation issues. In his works, the limitation of hand movements is explained by the impact on the general psychomotor development of the child.” French surgeons M. Gilbert and T. Tassin “scientifically substantiated the effectiveness of early surgical intervention in obstetric paralysis. In their studies, they proved that nerve reconstruction and nerve transplantation methods play an important role in restoring hand movements. These works served to improve rehabilitation outcomes in children.” To clarify this further, M. M. Ismailov's scientific works cover the issues of “correct management of the labor process, prevention of shoulder dystocia, and reduction of errors in obstetric practice.” He scientifically substantiated that the prevention of obstetric paralysis is directly related to the correct choice of delivery tactics.

American researcher S. H. Birch and his colleagues “studied the functional consequences of obstetric paralysis based on long-term observations. They noted that the restriction of hand movements in children negatively affects not only physical, but also psychological development. These scientific works justify the need for comprehensive rehabilitation.”. Also, although the sympathetic nerves are not so important, women can become pregnant and give birth normally even if the reflex path is cut due to spinal cord paralysis, which leads to painless childbirth.

Russian scientists V. I. Kozlov, N. A. Shabalov and others “in their research in the field of neonatal neurology, paid attention to the prevention of birth trauma, including obstetric paralysis. In their scientific works, proper labor management and early identification of risk factors were indicated as the main preventive measures.”. N. A. Khudoiberganova conducted research on the rehabilitation of postpartum movement disorders in children. Her works showed the importance of early physiotherapy and complex rehabilitation in obstetric paralysis in restoring hand function.

“Facial nerve palsy is a complication that often occurs after the use of obstetric forceps or as a result of compression of the facial nerve in the birth canal. Clinical signs include flattening of the nose and lip folds, an eye on the injured side that remains open, and a pulling of the mouth toward the healthy side when shouting. The paralysis may resolve spontaneously within a few weeks.” (Figure 1)



Figure 1. Facial drooping due to facial nerve palsy.

Brachial plexus paralysis is mainly associated with the process of childbirth, in which the brachial plexus, its nerve roots, or in some severe cases, the structures of the spinal cord are damaged. This pathology develops as a result of mechanical effects that occur during childbirth - stretching, compression, or partial rupture of nerves. Depending on the degree and localization of damage to the nerve fibers, obstetric paralysis manifests itself in various clinical manifestations.

In applied neurology, depending on which branch of the nerves is damaged, obstetric paralysis is divided into three main forms: upper (Erb type), lower (Duchenne-Klumpke type) and total (mixed) forms. Each form is characterized by its own clinical symptoms, degree of limitation of arm movements, and impaired muscle function.

Treatment of this condition requires an integrated approach. During the treatment process, therapeutic physical exercises serve to restore the functional activity of the muscles, massage improves blood circulation, and normalizes muscle tone. Physiotherapy treatments stimulate the restoration of nerve impulses, while drug treatment focuses on reducing inflammation and supporting the regeneration of nerve tissue. The combined use of these methods allows children to restore hand movement and improve functional capabilities.

Conclusion. Obstetric paralysis is one of the most important neurological problems that leads to limited hand movement in children. This condition occurs mainly as a result of damage to the brachial nerve ganglion, its nerve roots, or in some cases, spinal cord structures during childbirth. Stretching, compression, or rupture of nerve fibers disrupts the normal innervation of the hand muscles and leads to a decrease in motor activity. This negatively affects the child's physical development, as well as his activity in everyday life and social adaptation.

Studies show that the main risk factors for the development of obstetric paralysis are complicated labor, shoulder dystocia, birth of a large baby, and improper obstetric manipulations. Depending on which branch of the nerves is damaged, the disease manifests itself in different clinical forms and the degree of limitation of hand movement also varies. Therefore, each case requires an individual approach.

Early diagnosis is important in the treatment and rehabilitation of obstetric paralysis. The earlier the disease is detected, the more effective the treatment results will be. Complex treatment methods - therapeutic exercises, massage, physiotherapy and drug treatment - accelerate the recovery of nerve tissue, improve muscle function and help gradually restore hand movements. In severe cases, surgical intervention may be used.

In conclusion, the prevention of obstetric paralysis is closely related to the proper organization of the labor process, early identification of pregnant women at risk and the provision of qualified medical care. The joint efforts of medical workers, parents and rehabilitation specialists are of great importance in reducing the limitation of hand movements in children and improving their quality of life.

Obstetric paralysis is a complex neuromuscular disorder that causes limited hand movement in children, the causes of which depend on the mechanics of childbirth, the physiological state of the mother and congenital factors of the child. Early diagnosis, appropriate treatment and rehabilitation measures can significantly improve the functional ability of the child.

This article serves as a scientific approach to the formulation of strategies for restoring hand movement in clinical practice and the introduction of preventive measures.

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