



Journal of University Studies for inclusive Research (USRIJ)
مجلة الدراسات الجامعية للبحوث الشاملة

ISSN: 2707-7675

Journal of University Studies for Inclusive Research

Vol.3, Issue 31 (2024), 14367- 14379

USRIJ Pvt. Ltd

*Treatment of brachial plexus injury resulting from
a birth error in a newborn through body
engineering technique-hand therapy : Case Report
Described by Parents. Qualitative study*

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Abstract

Summary of Case Report on Neonatal Brachial Plexus Palsy

Treatment with Body Engineering/Hand Therapy

This case report describes the successful treatment of Neonatal Brachial Plexus Palsy (NBPP) in a 3-year-old boy using a customized rehabilitation plan based on body engineering and hand therapy techniques. The boy experienced paralysis and deformity in his right arm after a difficult natural childbirth due to his large birth weight (4.5 kg).



Key Points:

The baby sustained a closed-type brachial plexus injury (C4-C7 nerves) during delivery.

Initial physical therapy showed no improvement.

A 3-month long rehabilitation program using body engineering/hand therapy techniques was implemented.

The program included stretching, strengthening exercises, specific temperature therapy, and constraint therapy.

Treatment resulted in significant improvement in arm function, with parents reporting high satisfaction.

Important Considerations:

This is a single case report, and the findings may not be generalizable to all NBPP cases.

More research is needed to evaluate the effectiveness of body engineering/hand therapy for NBPP compared to other rehabilitation approaches.

Keywords

- Neonatal Brachial Plexus Palsy (NBPP)



- Body engineering
- Hand therapy
- Rehabilitation
- Physical therapy
- Case report
- Qualitative study

Study design:

Qualitative study

Purpose of Study:

To report a case of a newborn baby who suffered Neonatal Brachial Plexus, in addition to paralysis and dislocation of the shoulder in the right side in a natural childbirth case

the reason is attributed to the increased weight of the fetus at birth, which led to a prolonged period of labor

Method:

an informed for case report was given by from the child's parents

Functional recovery was achieved through a customized rehabilitation plan and hand therapy according to the body engineering technique

We highlight:

-Rehabilitation plan depending on body engineering-hand therapy technique that led to full recovery

-Explaining the patient's condition before and after the injury



- The patient's appearance
- satisfaction of the patient's parents after treatment

Clinical Features:

a newborn patient who experienced difficulties in childbirth as a result of being overweight (4.5 kg) and a long period of labor that led to a closed-type brachial plexus injury

The following clinical features were observed:

Injury to the C4 – C7 nerves resulted in inward rotation of the right arm with elbow extension, forearm extension, and abnormal position of the fingers, with absence of the Moro reflex on the same side, this was also accompanied by the inability to move the shoulder at all and was accompanied by the appearance of a dislocation

Result:

Treating the patient through body engineering (hand therapy) and rehabilitating him for a period of three months led to the appearance of signs of clinical and radiological improvement, and the patient's parents expressed satisfaction with his appearance.

Discussion:

Brachial plexus injuries affect the nerve network that provides feeling and muscle control in the shoulder, arm, forearm, hand, and fingers



During childbirth, a brachial plexus injury can happen

Physical therapy and patient rehabilitation remain one of the most important methods of treating Neonatal brachial plexus injury

Conclusion:

The World Health Organization defines rehabilitation as “a set of interventions designed to improve performance and reduce disability in individuals with health conditions in their interaction with their environment.” (WHO, 2020)

Introduction

The injury occurs during the process of childbirth to overweight babies and breech babies, even to a fetus of small or normal weight, as a result of the excessive tensile force during the birth process, stretching, ruptures or amputation of the roots of the spinal cord occur. Fortunately, most newborns who suffer from this condition experience spontaneous improvement, although a percentage of these children remain with varying degrees of weakness in the upper limb on the side of the lesion

Neonatal Brachial Plexus Palsy (NBPP) is a total or partial peripheral nerve injury which may affect C5–T1 cervical and thoracic roots, and which occurs during birth¹⁻²

Clinically, neonatal brachial plexus palsy (NBPP) presents in a newborn as a weak or paralyzed upper extremity, with the passive range of motion greater than the active. The overall incidence of NBPP, both transient and persistent impairment, is 1.5 per 1,000 total births³



method:

This is the case of Palestinian boy, currently 3 years old, with the right shoulder, arm, and hand affected by NBPP. he was born on 30 May 2021 in a natural birth where there was dystocia his weighing 4.5 kg After birth, he presented paralysis of the right upper limb with no movement in the arm and forearm, inward rotation of the right arm with elbow extension, forearm extension, and abnormal position of his fingers, and no sensory response in the entire limb with absence of the Moro reflex on the same side. There was no clavicle fracture the mother had no history of diseases the boy underwent two months physical therapy But he showed no improvement or response.

**Rehabilitation plan depending on body engineering-hand therapy technique that led to full recovery:*

During the treatment period, the patient underwent a number of hand therapy/body engineering sessions according to the following protocol:

Three sessions per week, each session lasting an hour

The session includes stretching and strengthening exercises aimed at improving the function of the affected limb and avoiding complications resulting from nerve disorder

Extension movements of the upper extremity joints helped avoid significant contracture that limits the harnessing of muscle force

Hand therapy sessions are carried out at specific temperatures and using oils that help relax muscles and connective tissues, stimulate blood circulation and reduce pain.

It should be noted that some of the strengthening exercises were performed on the back (Supine) and some on the abdomen (Prone) in order to get rid of the effect of gravity, provide comprehensive support for the affected limb, and improve muscle strength

In addition to placing some restrictions on the unaffected limb to stimulate the use of the affected limb, which is called (Constraint therapy)



FIGURE 1 : A side of hand therapy sessions

**Explaining the patient's condition before and after the injury*

The mother's pregnancy was normal, except for a larger than average abdomen and gestational diabetes. The mother also added that the gynecologist following up with her told her that she had extra amniotic fluid



During childbirth, she suffered from a difficult labor due to the baby being overweight (4.5Kg) and the birth occurred as a natural birth, which resulted in an injury to the child brachial plexus

Symptoms had shown soon after birth. have included

No movement in the newborn's upper arm and hand

Absent Moro reflex on the right side

Arm extended (straight) at elbow and held against body

inward rotation of the right arm with elbow extension, forearm extension, and abnormal position of the fingers, this was also accompanied by the inability to move the shoulder at all and was accompanied by the appearance of a dislocation

** The patient's appearance*

After the rehabilitation phase using manual therapy and body engineering, the clinical appearance of the affected upper limb improved with the complete absence of all signs of deformity as a result of the restoration of strength, flexibility and coordination in the affected limb.



FIGURE 2 : Hand appearance before treatment

* Satisfaction of the patient's parents after treatment:

The child's parents showed a high level of satisfaction with the outcome of the treatment because the child, after a period of 3 months of rehabilitation / body engineering / hand therapy, showed a significant clinical and functional improvement, as he transformed from paralysis and deformity in the right upper limb to the ability to control the limb in a large percentage as the child became active like other children, where he crawled and used his hand to pick up things, such as a ball, for example.



FIGURE 3 : Hand appearance after treatment

Result:

In repeated evaluation during 3 months of continuous rehabilitation, through the technique of body engineering and manual therapy, the patient showed a significant gradual improvement in the Arb point near the child's neck, where the fifth and sixth cranial nerves merge, which led to improved motivation, confidence and a positive attitude of the patient's parents towards the treatment.



The patient was evaluated before and after rehabilitation using patient-rated outcome measures, which included disability of arm, shoulder, and hand scores 7; WHO Quality

Discussion:

In the current case, all procedures care after neonatal brachial plexus injury were taken appropriately through body engineering /hand therapy ,techniques and the patient showed a noticeable response and improvement, which led to an improvement in the psychological state of the child's parents This is due to the connection between mental health and physical health where various forms of psychological distress have ,consistently been linked to a range of adverse physical health outcomes

It is recommended to follow up the condition periodically to ensure continued improvement and Avoid relapse

Conclusion:

Rehabilitation is defined as “a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment”.

Put simply, rehabilitation helps a child, adult or older person to be as independent as possible in everyday activities and enables participation in education, work, recreation and meaningful life roles such as taking care of family. It does so by working with the person and their family to address underlying health conditions and their symptoms, modifying their environment to better suit their needs, using assistive products, educating to strengthen self-management, and adapting tasks so that they can be performed more safely and independently. Together, these strategies can



help an individual; overcome difficulties with thinking, seeing, hearing, communicating, eating or moving around. (WHO, 2020)

This is what the sciences of body engineering/hand therapy are based on in treating incurable cases, including cases of brachial plexus injury.

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