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Treatment of Spastic quadriplegia resulting from hypoxia in newborn through body engineering technique-hand therapy Case Report Described by Parents: Qualitative study

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Abstract

Objectives: Summary of Case Report on Spastic quadriplegia accompanied by several disabilities. Treatment with Body Engineering/Hand Therapy. This case report describes the successful treatment of a 4 years old girl who was diagnosed with Spastic quadriplegia and global developmental delay accompanied with relapse, slurred speech, and cognitive delay resulting from hypoxia during child birth. To report a case of a girl who suffered Spastic quadriplegia, seizures, and delay in speech and perception due to hypoxia and to highlights the critical role of body engineering techniques for the rehabilitation of children with similar cases.

Methods: An informed case report was given by from the child's parents. Functional recovery was achieved through a customized rehabilitation plan according to the body engineering / hand therapy techniques

We highlight:

-Medical Management for such cases.

-A rehabilitation plan based on body engineering/ hand therapy techniques that led to complete recovery.

-Satisfaction of the patient's parents after treatment.

Results: Treating the patient through body engineering (hand therapy) and rehabilitating him for a full year led to the appearance of signs of clinical and radiographic improvement.

Conclusions: Hypoxia-induced spastic quadriplegia often results in multiple disabilities, as seen in this case. Early intervention using body engineering techniques can lead to significant improvements in physical and cognitive functions. Continuous monitoring and rehabilitation are recommended to sustain progress and prevent relapses (Odding et al., 2006). Based on the provided information, body engineering and hand therapy have proven to be highly effective in rehabilitating a girl with hypoxia-induced cerebral palsy. Through a comprehensive rehabilitation program, the patient's physical, cognitive, and communication abilities have significantly improved. This case report underscores the importance of early intervention in maximizing outcomes for children with spastic quadriplegia. By providing ongoing support and tailoring rehabilitation programs to individual needs, it is possible to help these children reach their full potential, aligning with the World Health Organization's definition of rehabilitation as a process to improve performance and reduce disability.

Keywords: Hypoxia-induced spastic quadriplegia, Body engineering, Rehabilitation, Motor skills, Cognitive function, Hand therapy, Cerebral palsy.

Introduction

Hypoxia in newborns can lead to a variety of health problems, including spastic quadriplegia, which can occur before, during, or after birth. Spastic quadriplegia is often accompanied by delayed growth, speech, and cognitive difficulties. Early detection and intervention are crucial. Physical therapy, particularly through body engineering techniques, plays an increasingly important role in managing cerebral

palsy and its associated disabilities, aiming to enhance physical independence and overall quality of life for affected children and their families (Das & Ganesh, 2019). Spastic cerebral palsy, as a type of motor dysfunction characterized by spasticity, occurs in about 2 to 3 per 1,000 live births(Oskoui, M., Coutinho, F., Dykeman, J., Jetté, N., & Pringsheim, T 2013).

Methods

This is the case of jourdanian girl, currently 4 years old, suffers from recurrent seizures and spastic quadriplegia with delayed speech and cognition affected by hypoxia. she was born on 26 decemper 2013. The early disabilities diagnosis center report outlined the fowling the case is spastic quadriplegia, associated with hypoxia.(see Figure 1) Brain MRI showed minimal widening of CSF spaces, while EEG detected generalized epileptic spikes. The patient was born to consanguineous parents and diagnosed at six months. The family history revealed a sister with global developmental delay and a maternal uncle with spastic quadriplegia.

- **Medical Management for such cases:**

Treatment for spastic quadriplegia varies but commonly includes oral medications such as baclofen, diazepam, and clonazepam (Chung et al., 2011). Botulinum toxin (BT) injections and intrathecal baclofen are also utilized for focal spasticity and spasticity control, respectively (Amirsalari et al., 2011; Kinnett, 2004).

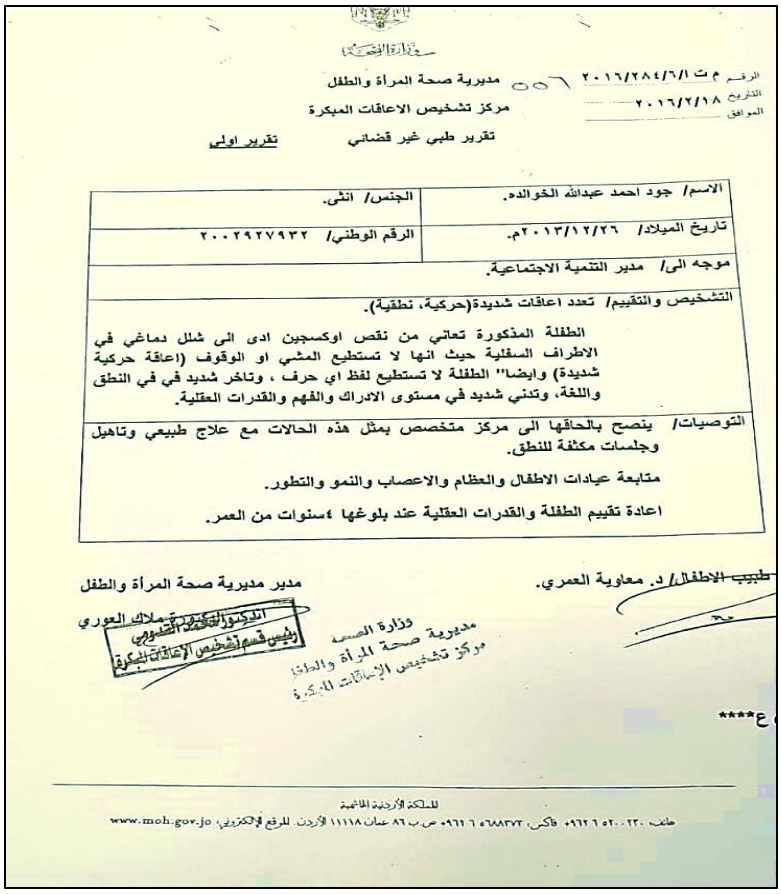
- **A rehabilitation plan based on body engineering/ hand therapy techniques that led to complete recovery:**

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

- Over 12 months, a session a week lasting an hour.

- Sessions included the Bobath technique (Knox & Evans, 2002) and other methods such as muscle massage, balance training, and hydrotherapy.
- Play-based therapy was integral component. 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.

The program resulted in significant motor and psychological improvements, as the patient regained the ability to perform daily activities independently and was accepted into school.



وزارة الصحة
مديرية صحة المرأة والطفل
مركز تشخيص الاعاقات المبكرة
الرقم م ت ا/٢٠١٦/٢٨٤/٦
التاريخ ٢٠١٦/٢/١٨
المرفق
تقرير طبي غير قضائي تقرير اولي

الاسم/ جود احمد عبدالله الخوالده.	الجنس/ انثى.
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موجه الى/ مدير التنمية الاجتماعية.

التشخيص والتقييم/ تعدد اعاقات شديدة(حركية، نطقية).

الطفلة المذكورة تعاني من نقص اوكسجين ادى الى شلل دماغي في الاطراف السفلية حيث انها لا تستطيع المشي او الوقوف (اعاقة حركية شديدة) وايضا" الطفلة لا تستطيع لفظ اي حرف ، وتاخر شديد في في النطق واللغة، وتدني شديد في مستوى الادراك والفهم والقدرات العقلية.

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Figure 1: The report of the early disabilities Diagnosis center

- **Rehabilitation Outcomes:**

- Motor Skills Improvement: Enhanced sitting, standing, and walking abilities.
- Psychological Health: Improved family well-being due to the patient's increased independence.
- Pain Reduction: Decreased muscle spasm-related pain.
- School Integration: Acceptance into school with peers. (see Figure 2)

المملكة الأردنية الهاشمية
وزارة التربية والتعليم

الرقم ٧٩٠١١٥/٧
التاريخ ٧ صفر ١٤٤٤
الموافق ٢٠٢٢/٠٩/٠٤

السيد مدير التربية و التعليم لمحافظة جرش

الموضوع : قبول الطلبة

السلام عليكم ورحمة الله وبركاته، وبعد،
لا مانع من قبول الطالبة المذكورة أدناه في الصف المبين إزاء اسمها للعام الدراسي ٢٠٢٢/٢٠٢٣ في مدرستكم و روضة العمر الذهبي بموجب أوراقهم الثبوتية وفي ضوء الطاقة الاستيعابية للمدرسة حسب الرخصة الممنوحة لكم للعام الدراسي ٢٠٢٢ / ٢٠٢٣ مع تطبيق أسس النجاح والإكمال والرسوب المعمول بها .

الاسم	الصف	ملاحظات
جود احمد عبد الله الخوالدة	الأول الأساسي	أردنية الجنسية
ملاحظة : الطالبة تحمل تقرير طبي للطلبة ذوي الإعاقة		

وتفضلوا بقبول فائق الاحترام

وزير التربية والتعليم

مدير
الخدمات التعليمية بالوكالة

Figure 2: Admission of the girl child to primary school

- **Satisfaction of the patient's parents after treatment:**

The girl's parents showed a high level of satisfaction with the result because the child after a year of treatment through Rehabilitation/Body Engineering/hand therapy, clinical and functional improvement, as she transformed from complete paralysis and inability to speak and understand to an almost normal girl who was accepted into school.

Results

Standardized pre- and post-intervention assessments were used to evaluate the effectiveness of the rehabilitation program. Initially a comprehensive assessment was conducted, including the Gross Motor Function Measure (GMFM) to assess motor skills and the Peabody Developmental Motor Scale (PDMS) to assess fine motor skills Using the Bailey Scales of Infant and Child Development (BSID) assessed cognitive functioning), including cognitive-language, motor domains were the focus. Pre-intervention results showed significant impairment, with GMFM scores showing a significant restriction in general metabolic rate and PDMS exhibiting a significant delay in metabolic rate aesthetically and delayed development in psychoanalysis. Post-treatment assessments 12 months after rehabilitation showed remarkable improvement. The GMFM score showed an increase in the ability to sit, stand, and walk, whereas the PDMS showed an improvement in fine motor skills. Cognitive assessment revealed improvements in cognitive, language, and motor skills, consistent with observed developmental gains. These standardized results attest to the positive effects of the use of body mechanics and manual therapy techniques in the rehabilitation program, and demonstrate significant improvements in physical and cognitive function.

Conclusion

Spastic quadriplegia is a severe cerebral palsy that affects all four limbs and is often associated with additional developmental disabilities This case report demonstrates the effectiveness of body engineering/ hand therapy in the rehabilitation of children, and highlights the importance of early intervention to maximize outcomes. Ongoing support and a tailored rehabilitation program are essential to help children with hypoxia-induced CP reach their full potential.

This case report highlights the potential of body engineering/hand therapy techniques in rehabilitating children with spastic quadriplegia induced by hypoxia. The patient in this study showed significant improvements in motor skills, communication, and cognitive abilities after a year-long program that incorporated manual therapy techniques, such as muscle massage and Bobath therapy, alongside aquatic therapy and play-based therapy. These findings emphasize the importance of early intervention using a comprehensive rehabilitation approach that includes body engineering/hand therapy techniques to maximize outcomes for children with spastic quadriplegia. Further research is warranted to explore the long-term effects of these techniques and compare their effectiveness against other rehabilitation methods for a larger cohort of patients.

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