



Effect of Early Intervention in an Infant with Erb's Palsy

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Abstract

Erb's palsy is a type of weakness or paralysis of muscles of upper limb due to traction injury to brachial plexus mostly during birth. Severity of symptom is based on level of injury. It is also sometimes called brachial plexus palsy. The mode of injury is mostly traction of head and neck at the side when the shoulders are passing through the birth canal during labor in head first delivery. But can also occur due to forceps delivery injury or vacuum extraction injury, breech presentation or when pulling the arm forcefully after birth. In case of mild and moderate level injury this condition improves in time, but some kids can have permanent complications if left untreated. Here an infant with Erb's palsy during birth and effect of early intervention on that infant is presented. The location of injury is the point where C5 and C6 form the upper trunk which is also known as Erb's point. The nerves affected are, supra scapular nerve (C5, 6), axillary nerve (C5, 6) and musculocutaneous nerve (C5, 6, 7). Muscles affected are from proximal supraspinatus, infraspinatus, serratus anterior, deltoid, biceps and brachialis. Thus this condition affects shoulder external rotation, abduction flexion and elbow flexion and supination. Due to opposite muscle pulling the arm will end up in adduction, internal rotation elbow extension and forearm pronation. This position is classically known as waiters tip position or policeman tip hand. It is important to understand the anatomy for diagnosis and proper management. With proper intervention many children can attain normal or near normal functions by 6 to 7 months of age but the injury can take up to 2 years to recover fully.

Keywords: Erb's Palsy; Erb's Point; Upper Trunk; Waiters Tip Position; Early Intervention

Introduction

Erb's palsy is a type of weakness or paralysis of muscles of upper limb due to traction injury to brachial plexus mostly during birth. Severity of symptom is based on level of injury. It is also sometimes called brachial plexus palsy [1]. The mode of injury is mostly traction of head and neck at the side when the shoulders are passing through the birth canal during labor in head first delivery [7]. But can also occur due to forceps delivery injury or vacuum extraction injury, breech presentation or when pulling the arm forcefully after birth. Sometimes it can be associated with clavicle fracture [8,9]. In case of mild and moderate level injury this condition improves in time, but some kids can have permanent complications if left untreated. The location of injury is the

point where C5 and C6 form the upper trunk which is also known as Erb's point. The nerves affected are, supra scapular nerve (C5, 6), axillary nerve (C5, 6) and musculocutaneous nerve (C5, 6, 7) [2,3]. Muscles affected are from proximal supraspinatus, infraspinatus, serratus anterior, deltoid, biceps and brachialis. Thus this condition affects shoulder external rotation, abduction flexion and elbow flexion and supination. Due to opposite muscle pulling the arm will end up in adduction, internal rotation elbow extension and forearm pronation. This position is classically known as waiters tip position or policeman tip hand.

Here an infant with Erb's palsy during birth and effect of early intervention on that infant is presented. Early intervention in

these cases with mild to moderate injury can be helpful in attaining near normal or normal hand functions. During early stages it is important to avoid fixed deformity so treatment should focus on movements on opposite direction and positioning. ROM activities are encouraged with caution. Parents are also taught to perform such movements within functional levels. Bimanual exercises like (HABIT) are proven as more effective [11].

Case Presentation

In the case presented here, a newborn baby girl aged 3 weeks presented with paralysis of right upper limb with normal primitive reflexes. Diagnosed with Erb's palsy during birth due to difficulty in labor in a private hospital, Bangalore. She was seen in outpatient department Recoup Neuromusculoskeletal rehabilitation center, Bangalore has been referred to physiotherapy. Chief complaints told by her mother was the baby is not moving the right arm and not grasping anything on right hand.

Upon examination using active movement scale [10] the child was unable to move her arm in abduction on gravity eliminated position and shoulder flexion was also greatly affected. Shoulder was kept in internal rotation. Elbow flexion was half way of the range of motion in gravity eliminated position. Forearm was kept in pronation and supination was impossible.

After the examination written consent from the mother was sought to proceed with photographs and presentation.

Treatment

First of all Careful handling of the infant is advised to the parent and caretaker. While performing movements at home they were advised to avoid full range of motion for 2 weeks to allow heal-



Figure 1: Showing typical waiters tip hand deformity at rest.



Figure 2: Wrist movement at maximum effort to move the right arm when stimulated.

ing of initial inflammation process. They Further advises includes avoiding picking a child up under the armpit and to avoid making the child lying on affected side as this can compress or stretch the brachial plexus and cause further injury. And while dressing the baby it is advised to put the affected arm first. Positioning the arm in abduction and elbow flexion using a pillow or roll of towel is promoted.

Passive movements were given upto functional range initially until 5-6 weeks. Then progressed to full range. Stretching of triceps is initiated at 5 weeks.

Along with kinesio taping is applied to stimulate biceps to promote elbow flexion and to keep the shoulder in neutral rotation and to stimulate external rotation.



Figure 3: Shows the kinesio taping application. And constraint induced movement therapy where the left hand is kept under clothing

Electrical stimulation with low intensity was applied on biceps and deltoid.

PNF diagonal patterns were initiated at 3 months to stimulate midline crossing activities.

Bimanual activities were stimulated with use of toys and rattles.

Prone on elbow position was encouraged to bear weight through both the hands at 3 months of age. And encouraged to crawl in later months.



Figure 4: Prone on elbow at 6 months.

Constraint induced movement therapy was initiated at 5 month of age to stimulate fine movements and forearm supination.

Hydrotherapy in small pool was given as recreational activity to stimulate bilateral hand activities.

Results

Shoulder abduction was initiated first at gravity eliminated position followed by shoulder flexion upto half range of motion at against gravity position. At 5 weeks. Elbow flexion was combined with shoulder flexion and adduction at initial stages. Later the child exhibited independent elbow flexion activities at 3 months.



Figure 5: Elbow flexion associated with shoulder flexion and adduction at 8 weeks.

At the end of 3 months she exhibited more complex movements of right hands. Finally at 7 months of age she got near normal function of right hand.



Figure 6: Bimanual activities at 7 months.

At age of 6 months she was discontinued from intensive therapy and promoted on recreational activities and follow up once a month up to an year.



Figure 7: Near normal hand functions at 1 year.

She reclaimed near normal hand functions at 1 year according to her age.

Conclusion

In conclusion knowledge of Erb's palsy and early identification and intervention can bring near normal to normal hand functions in 80-90 percent of children with mild to moderate injuries.

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