



Obstetric pan brachial plexopathy: Case report

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Abstract

Obstetric brachial plexus injury also known as birth related brachial plexus injury has a reported incidence of 0.15-3 per 1000 live births. The extent of the injury varies from involvement of one trunk to involvement of all the roots and trunk which is called pan plexopathy. Physiotherapy is essential for the patient not only to prevent the contracture but also to detect the early signs of recovery and to encourage the child for spontaneous movement of the limb. The present report describes the case of a 11 months' female child with obstetric pan brachial plexopathy treated with surgery and is presently undergoing physiotherapy.

Keywords: obstetric pan, physiotherapy, pan plexopathy

Introduction

Obstetric brachial plexus injury also known as birth related brachial plexus injury has a reported incidence of 0.15-3 per 1000 live births. Mechanism causing the injury includes fetal macrosomia or breech presentation, maternal diabetes, shoulder dystocia, cephalopelvic disproportion and prolonged 2nd stage of labour. Some literature also suggests intrauterine maladaptation to be cause. The injury sustained to the roots of brachial plexus varies in extent and nature. The nature of the injury could be axonotemesis, neurotemesis or complete root avulsion. The extent of the injury varies from involvement of one trunk to involvement of all the roots and trunk which is called pan plexopathy. Though spontaneous recovery is always present, a large subset of this patients require surgical intervention at an early age for better prognosis. Electrophysiological investigation is recommended at 4 weeks of age to establish a diagnosis and to obtain the baseline data. Follow up is required at every 4 weeks till the child attains the age of 3 months when the decision regarding the need of surgery is made based on clinical and electrophysiological features. Gentle joint mobilisation and preservation of muscle length is crucial to prevent joint stiffness and muscle contracture irrespective of the mode of medical management. Physiotherapy is essential for the patient not only to prevent the complications but also to detect the early signs of recovery and to encourage the child for spontaneous movement of the limb. The present report describes the case of a 11 months' female child with obstetric pan brachial plexopathy treated with surgery and is presently undergoing physiotherapy.

Case Overview

An eleven months old female child was brought to the physiotherapy OPD by her parents with complain of total loss of movement in her right UE. History provided by the mother revealed difficult second stage of labour and delivery of the child had to be assisted by vacuum on 27/4/2017. Birth weight of the child was 4.5kg. The mother revealed uneventful prenatal course. After delivery as the child did not show any

movement in Right UE, a MRI was suggested which revealed – 1) small discrete pseudomeningocele formation at C7 to D1 level on right side, 2) C5-C8 root avulsion with pseudomeningocele formation on right side, 3) intact T1 root on right side. This lead to the diagnosis of birth related pan-brachial plexopathy.



Fig 1: Flail Rt Upper Limb

The child then underwent surgery on 2-10-17 at the age of 5 months. Surgical notes described the procedure as follows: Right brachial plexus was explored under GA. Right spinal accessory nerve was neurotized to right suprascapular nerve. Sural nerve cable graft was placed between C3 and upper trunk, T1 and lower trunk. Following the surgery right arm was immobilised with a chest strapping for 15 days after which the patient was referred for physiotherapy.



Fig 2: Surgical Scar

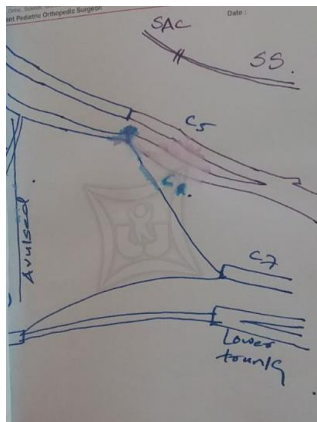


Fig 3: Surgical Procedure

The child was brought to the physiotherapy department at the age of 6 months and physical examination showed muscle strength of grade 0 (MMT) for all the muscles of right shoulder, elbow, wrist and fingers except shoulder adductors which was graded as 1. Strength duration curve was plotted

for right abductor digiti minimi (ulnar nerve), abductor pollicis brevis (median nerve), and extensor indicis (radial nerve) which suggested complete denervation in all the three tested muscles.

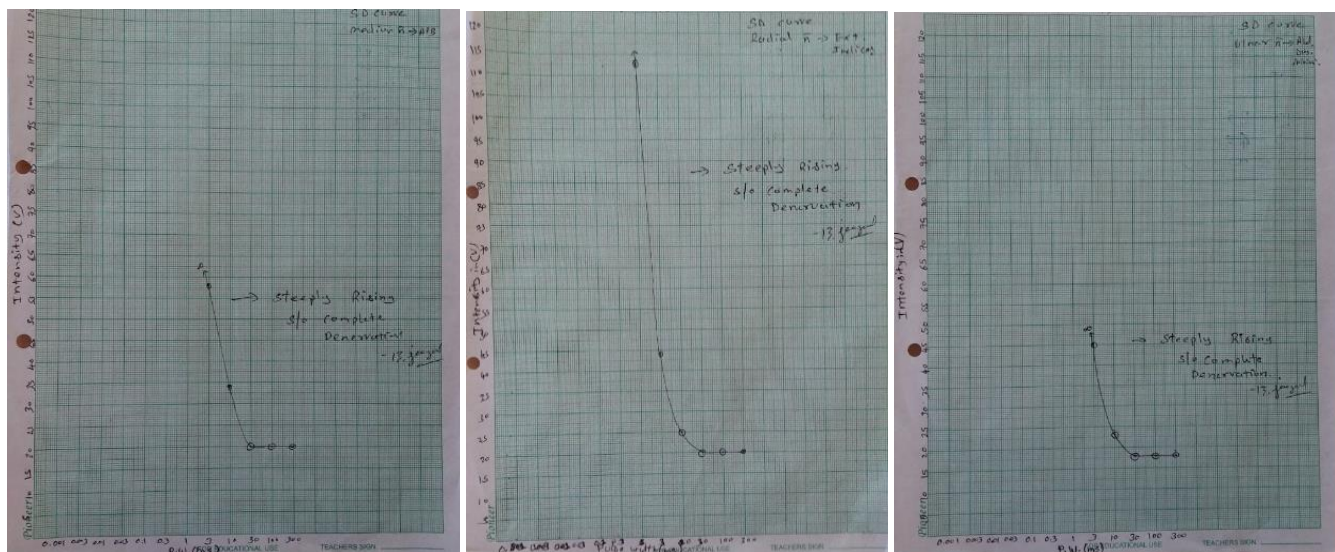


Fig 4: Strength duration curve of radial ulnar median nerve

Physiotherapy plan of care

Three major goals identified for physiotherapy management were as follows:

1. To maintain muscle length
2. To maintain muscle property
3. To maintain joint mobility

Intervention

1. Passive elongation of multijoint muscles i. e., bicep, tricep, long finger flexors and extensors and first web space to their full physiological range. (3 repetitions with 30 secs hold). Extreme care is taken not to overstretch the flaccid muscle
2. Electrical stimulation with Interrupted Galvanic current with 300ms pulse width for major muscles of right UE i.e., deltoid, bicep, tricep, brachioradialis, extensor and flexors of wrist and fingers, thenar and hypothenar

muscles. Stimulation intensity was increased till a visible contraction of the muscle was produced and 90 contractions were given for each muscles. Muscles were stimulated at the motor point using a pen electrode as active electrode. Reference electrode was kept over the muscle tendon for stimulation of large muscles and over the nerve for stimulation of small muscles.

3. Passive ROM exercise for all the movements of right shoulder, elbow, wrist and fingers in physiological range (10 repetitions)

Outcome

After completion of 5 months of physiotherapy treatment, the patient has no improvement in terms of muscle strength. However regular sessions of physiotherapy have prevented development of any muscle contracture or joint stiffness which are likely to happen because of prolonged immobility.

Review of literature suggests that recovery process can take up to 1.5 years and may not be always complete. Rehabilitation programme can be continued till the child attains the age of 5-6 years.

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