

A holistic approach to the management of Erb's palsy

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ABSTRACT

A 4.5-month-old female baby, presenting with complete paralysis of right upper limb with typical waiter's tip deformity, diagnosed as Erb's palsy was brought to Sri Ganapati Sachchidananda Hospital. Patient was treated with an integrated approach of physiotherapy and Ayurvedic treatment with an intention of aiding faster recovery of the patient to lead a near normal life. As per Ayurvedic classics, this condition can be correlated to *Ekangavata* (*Vata* effecting any one part of the body), which is *Apatarpana* in nature (diseases with deprived growth of body tissue). Hence, the choice of treatment is *Santarpana Chikitsa* (nourishing treatment). *Santarpana Bahyopakramas* (nourishing external treatment modalities) such as *Ashwagandhabalalakshadi Taila* (Ayurvedic medicated oil) *Abhyanga* (oleation therapy) and *Shastikashali Anna Lepa* (application of processed rice paste) were administered along with electrical stimulation (physiotherapy modality), both galvanic and faradic current in three sessions. Appreciable results were observed in the form of reduction of disparity in length and mid-arm circumference of right upper limb compared to unaffected left upper limb and the muscle power too improved from zero to four, facilitating patient to near normal movement.

Key words: *Abhyanga*, brachial plexus injury, erb's palsy, *Shastikashali Anna Lepa*

INTRODUCTION

Erb's palsy^[1] is a condition where the upper part of brachial plexus (C_5, C_6) that innervates the arm is severed resulting in adducted, internally rotated shoulder and pronated forearm, typically known as "waiter's tip" position. The most common cause being dystocia (associated with difficult breech and forceps deliveries), the nerve damage can vary from bruising to tearing and hence paralysis can be partial or complete. It is also caused by clavicle fracture unrelated to dystocia

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or following a traumatic fall at any age.^[2] The treatment of Erb's palsy depends on the nature of damage, which is either nerve bruise or nerve tear. Nerve bruise usually resolve on its own over a period of months. However, in the latter case i.e. nerve tear, the following multiple approaches are advised physiotherapy^[3] for regaining muscle usage, surgical interference^[4] of nerve transplants (usually from the opposite leg), subscapularis releases, latissimus dorsi tendon transfers and rehabilitation therapy. The present case was considered as *Apatarpana Vjyadhi* (diseases with deprived growth of body tissue)^[5,6] – *Ekangavata* (*Vata* effecting any one part of the body) with symptoms of *Balakashaya* (diminished strength), *Karmakashaya* (annihilation of work) and *mamsa-asthi dhatu kshaya* (disuse atrophy of muscle-hampered growth of bone tissues). *Ashwagandhabalalakshadi Taila* (ABL) *Abhyanga* and *Shastikashali Anna Lepa* (SSAL) along with electrical stimulation were adopted and treated to obtain cumulative effect of both systems of medicine.

CASE REPORT

A 4.5-month-old female baby was brought to Physiotherapy Department of Sri Ganapati Sachchidananda Hospital by her parents with complaints of inability to move her right upper limb and abnormal position, progressive since birth.

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On examination

- Arm was internally rotated, adducted, elbow extended, forearm pronated and with a closed fist of right upper limb
- Passive range of motion was not full and free at shoulder patient was crying on flexion and abduction beyond 150° and 130° respectively
- Elbow, wrist, metacarpophalangeal joints and interphalangeal joints of right upper limb were full and free passively. There was no grasp reflex
- All developmental milestones were normal, except for movements of right upper limb
- Muscular contractions of deltoid, biceps, triceps, supinator, flexor and extensors of wrist, metacarpophalangeal and interphalangeal were elicited suggestive of C₅, C₆, and C₇ nerve damage^[3]
- Muscle power was assessed for all the muscle groups of right upper limb and were of grade 0.^[7]

Past history

According to patient’s mother, doctors had suggested delivery by caesarean section due to the breech presentation; however, considering personal request and financial conditions of the parents, forceps assisted vaginal delivery was performed. Both mother and baby were healthy following the delivery. Later, the parents noticed that the baby was not using her right upper limb completely, with gradual progressive deformity. It was diagnosed as Erb’s palsy by a pediatrician and suggested for physiotherapy as an early measure of treatment, before electing surgical options.

Procedures administered to the patient

Electrical stimulation was administered by placing active electrode on skin at the nerve root, i.e. base of the neck. Pen electrode was placed on motor point and muscle mass in faradic and galvanic currents respectively.^[3] Patient was treated for 28 days of physiotherapy treatment, in three divided sessions [Tables 1 and 2].

Ayurveda treatment

- Quantity sufficient of indirectly heated ABL *Taila* was applied in *Anuloma Gati* (downward) for 15 min
- 25 g of *Bala Mula* (roots of *Sida cordifolia* Linn.) was processed with 500 ml of *Ksheera* (milk) where in milk was boiled to reduce the quantity to half and filtered. 25 g of *Shastikashali* was cooked very soft and made like paste with above filtrate of *Ksheera Yukta Bala Mula*. This paste was applied with gentle circular movements for 20 min in *Anuloma Gati*. Patient was treated with a total of 35 days of Ayurvedic treatment, in three divided sessions [Tables 1 and 2].

RESULTS

With first session of treatment, the muscle power improved from zero to one [Figure 1] and range of motion of right shoulder for flexion and abduction improved from 150° to 130° respectively to full (180°) and free with passive mobilization. Electrical stimulation was discontinued after third session as the muscle power had improved to grade 3 and electrical stimulation would not be of much benefit and also the patient was not cooperating. As patient was too young to encourage active exercises, one session of *Bahyopakrama* was continued to improve muscle power [Table 2]. Before treatment, there was a difference

Table 1: Procedure of both the modalities

Treatment modalities	Treatment procedure
Ayurvedic treatment: <i>Abhyanga</i>	Application with ABL <i>Taila</i> to upper trapezius and complete right upper limb for 10-15 min
<i>Shastikashali Anna Lepa</i>	SSAL was applied over the affected area for 15-20 min
Physiotherapy: Faradic stimulation	Duration of 5 min to motor points of each group-deltoid, biceps, triceps, supinator, flexor and extensors of wrist
Galvanic stimulation	Twenty muscular contractions to each of above mentioned muscle groups

SSAL=*Shastikashali Anna Lepa*, ABL=*Ashwagandhabalalakshadi Taila*

Table 2: Treatment pattern

Session number	No. of days/ sessions of physiotherapy	No. of days/ session of Ayurvedic treatment	Result
First session	11 days	Last 5 days with the first session physiotherapy	Muscle power 0-1
Interval between sessions	Alternative days	No gap	-
Second session	10 days	10 days	Muscle power 1-2*
Interval between sessions	20 days	20 days	-
Third session	7 days	10 days	Muscle power 2 ¹ -3
Interval between sessions	20 days	20 days	-
Fourth session	Discontinued	10 days	Near normal
Total number of days for treatment	28 days	35 days	-

Table 3: Measurement of right and left upper limbs

Date	Upper limb	Length of full arm (cm)	Mid arm circumference (cm)
Before treatment	Right	24	13.5
	Left	24.3	13.7
After treatment (1 week after completion of treatment, when patient came for last follow-up)	Right	28.5	14.8
	Left	28.5	14.8



Figure 1: Before treatment. (a) 'Waiter's tip' position, (b) Electrical stimulation, (c) Shashtika Shali Anna Lepa, (d) Movement only with support

in length and mid arm circumference of both upper limbs. After treatment, the disparity in measurements was reduced [Table 3] along with improved muscle power to near normal (grade 4+, but less than 5) [Figure 2].^[8]

DISCUSSION

The present case of Erb's palsy was advised for surgical rectification. Considering the child's age, the parents approached for conventional treatments. The recovery was faster and better and without any invasive treatments, significant improvement of muscle power was observed in the affected muscle groups with the increase in length and mid-arm circumference of affected upper limb. The improvement persisted at further follow-up, after 1-2 months.

Erb's palsy is a condition that affects muscular activity due to nerve root injury. Physical therapy or physiotherapy as the name suggests, all treatment modalities are given externally or physically to maintain physical health. Difference in measurements of length and mid-arm circumference of right upper limb in comparison with left upper limb is attributed to non-usage of the affected limb, resulting in stunted skeletal growth and disuse atrophy of muscles. This was considered as *Mamsa-Asthi Dhatu Kshaya* with *Vata* involvement i.e. muscular dystrophy of right upper limb associated with weakness. Pathophysiology understanding of this condition in Ayurveda suggests *Santarpana Chikitsa*^[5,6] and considering the age of the patient, *Bahyopakrama* were selected as treatment of choice. The route of administration was external in both the systems enhancing the cumulative effects of treatment.

Faradic current stimulation is effective in rehabilitating the affected nerve to conduct impulses for muscular contractions through respective motor points. Galvanic



Figure 2: After treatment. (a) Patient with support reaches the object, (b) Uses both hands and bears weight on affected limb

current prevents muscular wasting and improves muscle tone. Thus, electrical stimulation with faradic and galvanic current rehabilitates affected nerve and muscle respectively.

The main ingredients of *ABL Taila* are *Ashwagandha* (*Withania somnifera* Dunal),^[9] *Bala* (*Sida cordifolia* Linn),^[10] *Laksha* (*Laccifer lacca*) and *Tila Taila* (Sesum oil). All ingredients of *ABL Taila*, *Ksheera* (milk),^[11] *Shashtikashali*^[12,13] and *Bala Mula* possess *Santarpana* qualities with *Prithvi* and *Ap Bhutas* (subtle elements of earth and water, which are nourishing in nature) and is indicated for *Balya*, *Brimhana* (nourishing), strengthens *Dhatu*s (building blocks) and *Vata* pacification. *Abhyanga*^[14,15] mitigates *Vata Dosha*, *Pushtikara* (promotes strength) and is *Bhrubhatwakrit* (stoutens). *Abhyanga* and *SSAL* were performed in *Anuloma Gati* because the *Dosha* involved is *Vata* as there is *Dhatu Kshaya* (muscle wasting) and inability to transmit nerve impulses. Considering the *Dosha* and *Dhatu* involvement *Vataniyantrana* and *Balya* treatments were selected and movements were performed in *Vata Anuloma Gati*.

All ingredients of *ABL Taila*, *Shastika Shali* and procedures *Abhyanga*, *Anna Lepa* have innate nourishing properties that might have facilitated remyelination of served nerve and faradic current stimulation rehabilitates the served nerve fibers to transmit maximum number of impulses with the minimum amount of stimulus for muscular contractions. *Shastika Shali* is clinically used in the treatment procedure of *Shastika Shali Pinda Sweda* in conditions of muscular dystrophy as symptom. Considering the age of patient, *Shashtika Shali Pinda Sweda* (type of treatment procedure) was adopted as *SSAL*. *Shastika Shali* has nourishing property, which nourished *Mamsa-asthi Dhatu*. Galvanic current stimulation improves muscle tone. Thus, combination of *ABL Taila Abhyanga*, *SSAL* and electrical stimulation facilitated faster recovery of the patient with growth of bone and muscle tissue as observed by increased

length, mid-arm circumference and improved muscle power of all muscle groups of right upper limb.

CONCLUSION

To conclude though the Erb's palsy is known for poor prognosis because of the nerve damage, in the present case, two systems of medicine (Ayurveda and Physiotherapy) complemented each other for enhancing recovery, thus facilitating near normal usage of limb in the patient.

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