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Management of frozen shoulder by leech therapy and adjuvant phytotherapy: A case study

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Abstract---BACKGROUND: Frozen shoulder is also known as adhesive capsulitis. It is one of the common musculoskeletal disorders. Its common symptoms such as pain and restricted movement of the shoulder joint. Conventional management of frozen shoulder include oral analgesics, range of motion exercises, intra-capsular corticosteroids injection, local application of analgesic oils and ointments but no such effective results have been found yet. As per Ayurveda perspective the condition can be correlated with Avabahuka. Further, Jalaukavacharana (~leech therapy) is one of the ancient para-surgical procedure described in Ayurveda for treatment of variety of such inflammatory condition along with other para surgical procedure and internal herbal drugs. METHODOLOGY: A 52 - year female patient having chief complaints of pain with restricted movement of left shoulder joint, pain in cervical region radiating towards left shoulder joint and mild tingling sensation on lower back region, was clinically diagnosed as case of frozen shoulder. This

patient was treated with specific regimen such as Jalaukavacharana (~leech therapy) locally along with Ashwagandhaghanvati and Panchatikta ghrita guggulu internally. The parameters observed for prognosis were pain, stiffness, range of movements. Therapeutic evaluation of treatment was done based on improvement in the symptoms. **RESULT:** The observations showed remarkable improvement in terms of pain, stiffness, range of movements and this observational case study revealed that leech therapy (locally- with one sittings of leech application done at an interval of eight days) along with Ashwagandhaghanvati and Panchatikta ghrita guggulu internally provided significant relief in symptoms of frozen shoulder. **CONCLUSION:** Based on relief in the sign and symptoms, we can conclude that leech therapy along with adjuvant phytotherapy proved efficacious in the management of frozen shoulder w.s.r. to Avabahuka.

Keywords--frozen shoulder, Avabahuka, Jalaukavacharana, Ashwagandhaghan vati, Panchatikta ghrit guggulu.

Introduction

Frozen shoulder is a painful shoulder condition of unknown aetiology that affects the capsule of shoulder. The rotator interval between supraspinatus and subscapularis is affected predominantly.¹ Frozen shoulder most commonly affects people between the ages of 40 and 60 years.² Women are more affected than men.³ Frozen shoulder is more common in diabetics.⁴ As frozen shoulder is one of the common musculoskeletal disorders encountered in Indian population with a prevalence of almost 50% patient with diabetes a 2-10% in non- diabetics' patients.⁵ It is characterized by pain and restricted movement of the shoulder joint.⁶ In modern medicine management of frozen shoulder includes oral analgesics and range of motion exercises, intra- capsular corticosteroids injection local application of analgesic oils and ointments, but no such effective results have been found yet.⁷ In Ayurveda, based on resemblance in clinical features we can correlate this disease with '*Avabahuka*' that affects the *Amsa Sandhi* (~shoulder joint).⁸ As per text the etiological factors of *Avabahuka* are vitiation of *Vata dosha* and loss or dryness of the *sheshmaka kapha*. The symptoms given are painful and restricted movement.⁹ In Ayurveda, various treatment modalities like *Raktamokshana*, *Agnikarma*, *Basti chikitsa*, *Nasya karma*, *Stanik snehan*, *Stanikswedan* and palliative medicines such as *Ashwagandhaghan vati* and *Panchatikta ghrita guggulu* are advocated in the management of frozen shoulder (*Avabahuka*).¹⁰

Patient Information

In the present case study, A female patient aged 52 years, came with chief complaints of pain with restricted movement of left shoulder joint, pain in cervical region radiating towards left shoulder joint and mild tingling sensation on lower back region since 15 month, visited Shalyatantra (Surgery) department of DYPAH for Ayurvedic management. Her past history revealed that she had hypertension and vertigo 7yrs back. Similarly, she had periorbital swelling on right eye, hypocalcaemia with deficiency of vit D3. There was no specific allergy history or no

major illness or relevant family history. Dietary history of patient revealed that she is vegetarian with good appetite at regular time. Her personal history showed light interrupted pattern of sleep. Patient was not habitual to any kind of addiction, whereas, bowel habit was irregular with occasional constipation. On clinical examination patient was hemodynamically stable with pulse 72/min, RR 18/min & BP 130/80mmhg. While on general examination it was found that symptoms like pallor icterus, clubbing, cyanosis, oedema and lymphadenopathy were absent. Considering that her *prakruti* is *vata pradhan kapha*.

Clinical Finding

On local examination, Tenderness at anterior and posterior aspect of left shoulder, tenderness at anterior aspect of left upper arm observed clinically. Abduction was extremely painful, patient was unable to raise hand above 30 degree angle with painful and restricted movement.

Investigations

- Blood test: CBC- Hb – 11.3 g/dl, TLC- 6700cumm, ESR 22 mm/hr, PLT – 3.30 lakhs/cumm, Neutrophil – 62%, FBS - 95 mg/dl, PPBS – 104 mg/dl
- Radiological investigation: X-ray Left shoulder joint AP/LAT: report was apparently normal.

Diagnosis

On the basis of clinical assessment, patient was diagnosed as a case of Frozen shoulder (*Avabahuka*).

Timeline

Details of timeline of intervention is mentioned in Table 1

Therapeutic Interventions

The patient was treated with specific combination regimen Leech therapy locally along with internal Ayurvedic drug *Panchatiktaghrit Guggulu*, *Ashwagandhaghan vati* internally and periodic assessment of prognosis with therapy was observed. Proper counselling, written informed consent was recorded after explanation of proposed line of treatment, following international council for Harmonised Tripartite Guideline.¹¹ For the therapeutic evaluation, parameters such as pain, stiffness, difficulty in movements were assessed before, during and after completion of treatment. *Stanik snehan* (local oleation around affecting shoulder joints and upper arm) with mahanarayan taila and stanik swedan (local sudation around affecting shoulder joints and upper arm) with *Dasmoola bharad* for 5 days (16/12/21-20/12/21). Jalukavacharan (~Leech therapy-two sitting given at interval of seven days) locally adjuvant to *Panchatiktaghrit Guggulu* (250mg each) 2 tablet twice a day, *Ashwagandhaghan vati* (500mg each) 2 tablet twice a day internally for 30 days. Patient was advised to continued her previous ongoing medicine such as Tab. Neurobion forte 1 tablet at night, Tab. Amlip-5mg. 1 tablet once a day.

Standard operative procedure of leech therapy

- **Purva Karma (Pre operative procedure)**-The leeches were purified and activated by putting it in bowl containing *Haridra powder* (*Curcuma longa*) and water. Thereafter, leeches were transferred to another bowl of clean water. Similarly, part preparation i.e. cleansing and draping (Left. shoulder joint) of the patient was done.¹²
- **Pradhan Karma (Main procedure)**
Patient was placed in supine position and shoulder region was cleaned with normal saline. Subsequently seven leeches were applied at the antero-superior part of left shoulder joint for 45 mins. (Figure 2). Leeches were covered by wet cotton gauze to moist its skin. After 45 minutes of blood sucking, the leeches fallen off from the site spontaneously.
- **Paschat Karma (Post operative procedure)**- After Pradhan karma the site was cleaned and *Haridra powder* was applied on bleeding site followed by applying of tight dressing with sterile gauze and adhesive sticking tape. The bandage was removed coming morning.

Further, induction of emesis to the leech was done by dusting *Haridra powder* on its mouth, followed by putting it into *Haridra jala*, then in pure water. The used leeches were kept in a separate jar labeled with details of the patient. Adjuvant and palliative Ayurvedic medicine, *Panchatiktaghrit Guggulu* (250mg each) 2 tablet twice a day, *Ashwagandhghan vati* (500mg each) 2 tablet twice a day were given. The patient was assessed at regular intervals and the details of assessment parameters with gradation criteria (0-3 scale) are mentioned in Table 2.

Gross effect of therapy

Gross effect of therapy has been assessed in terms of complete remission, marked improvement, moderate improvement and mild improvement which are mentioned in Table 3.

Result

On day 1, all the symptoms such as Lt. shoulder joint pain, Lt. shoulder stiffness, Difficulty in movements were severe(+++).(Figure.1). On day 6 of treatment (after 1st sitting of Leech therapy) symptoms such as left shoulder joint pain subsided from severe (++) to mild (+), left shoulder stiffness reduced from severe(+++) to moderate (++) , difficulty in movements decreased from severe (++) to moderate(+). Further after 2nd sitting of Leech therapy on day 12, the symptoms such as pain in left shoulder joint got complete relief, left shoulder stiffness subsided from moderate(++) to mild(+), difficulty in movements moderate(++) to mild(+). The symptoms were observed till 15 days and thereafter, follow up on 21st day and 30th day. After two sitting of leech therapy on day 13 range of movement such as flexion movement increased from 40 degree to 80-degree extension movement increased from 15 degree to 70-degree, abduction movement increased from 30 degree to 90-degree, adduction movement increased from 30 degree to 70-degree, external rotation increased from 50 degree to 90-degree, internal rotation increased from 40 degree to 80 degree. (Figure 3) and Table 4: Shows therapeutic efficacy of prescribed treatment.^{14, 15}

Discussion

As *Avabahuka* is a *Vata Vyadhi*, which in general is difficult to cure and the line of treatment of *Vatadosha* comprises of *Snehana*, *Swedana*, *Samshodhanaby* means of *Panchakarma* and *Nidanaparivarjana*. Since the *sthana* of *Avabahuka* is in *Amsasandhi* (Shoulder joint) which is seat of *Kapha*, so the treatment regimen was designed with the aim to pacify the *vata-Kapha Dosha Dushti* both internally and externally & to address the *Kha Vaigunya* by strengthening the joint.

Probable mode of action of therapy

- *Stanik Snehana* (Oleation)
Snehana implies oleation of the body and is described as one of the important *Purvakarma* (precursor) to *Panchakarma*. As *Vata Dosha (Dhatukshayjanya)* gets pacified by *Sneh* (oleation), this therapeutic procedure includes lubrication of body chiefly with medicated oil. Neuro-hormonal effects due to *Bahya Snehana* has been established, stating that massage increases levels of Dopamine, increases availability of serotonin, may elevate epinephrine (adrenaline) and release of endorphins. (Research conducted at TOUCH Research Institute at the University of Miami). All these neuro-hormones alter brain chemistry which in turn reduces response to pain sensation.¹⁶
- *Stanik Swedana* (Sudation)
Swedana implies hot fomentation which is also the precursor procedure to *Panchakarma* which helps in inducing sweating to the patient. This procedure is done to curb the *Vata Dosha* vitiated due to increase in its *Sheeta* property. The role of *Swedana* is best understood with Transient Receptor Potential Channels. These receptors are mainly found in nociceptive neurons of peripheral nervous system. Upon further literary search, it is known that TRPV1 channels are responsible for perception of heat and pain both thereby, facilitating the role of *Swedana* in management of pain.¹⁶
- Leech therapy
This therapy involves application of *Nirvish Jaluka* (Non poisonous leeches – *Hirudomedicinalis*) at the most tender part around Left shoulder joint. It is hypothesized that the strong sensory stimulus caused by the pain and burning sensitive of the leech bite can alleviate the symptoms of the patient through the gate control theory moreover, review of components of medicinal leech saliva reveals that, *Hirudin* inhibits blood coagulation by binding to thrombin, *calin* inhibits collagen mediated platelet aggregation, *Festabilase* dissolves fibrin, *Hirustasin* inhibits kallikrein, *trypsin* neutrophilic eatherinsin G, *Bdelin* acts as anti – inflammatory and inhibits activity of cathepsin G, *carboxypeptidase A* inhibitors increase the inflow of blood at the bite site, *Histamin* like substance which causes anesthesias at the bite site.¹⁷
- Internal medication
Panchatiktaghrit guggulu very effective in *vata vyadhi* for its *Tikta Rasa* (taste) & useful in *Asthidhatu chikitsa*. When *tikta dravya* is used, it causes *vata vruddi* and it will lead to *Ashti Kshaya*. Since *Ashti* is *Khara* by its nature, in order to control *vata* and to make *Asthi Vruddi*.^[18,19]
- *Ashwagandha* is very revered herb of the Indian Ayurvedic system of medicine as a *rasayan* (tonic). It was also found useful in neurodegenerative

disease. It has GABA mimetic effect and was shown to promote formation of dendrites. It has anxiolytic effect and improves energy levels & mitochondrial health. It is an anti-analgesic that soothes nervous system from pain response. [20,21]

Conclusion

The observations revealed that, this specific treatment, comprising of *Stanik Snehan* (local oleation), *Stanik Swedan* (local sudation) & Leech therapy adjuvant to *Panchatiktaghrit guggulu*, *Ashwagandhaghan vati* in the prescribed dose provided significant relief in the management of symptoms of as pain, stiffness, difficulty in movements. Thus, the current case study confirms the curative role of *Jalukavacharan* in Frozen shoulder with special reference to *Avavahuka* and can definitely avoid unnecessary surgical intervention. Moreover, a larger number of cases need to be treated and evaluated with this regimen to establish this alternative treatment modality in the management of Frozen shoulder.

Declaration of patient consent

Authors certify that they have obtained patient consent form, where the patient/caregiver has given his consent for reporting the case along with the images and other clinical information in the journal. The patient/ caregiver understands that his name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Tables

Table 1
Shows timelines of intervention

Sr. No	Date	Clinical Event/Intervention
1	16/12/2021 to 14/01/2022	Internal medicine- <i>Panchatikta ghrita guggul</i> 2 tablet twice a day, <i>Ashwagandhaghan vati</i> (500mg each) 2 tablet twice a day for 30 days.
2	16/12/2021 to 20/12/2021	Local treatment <ul style="list-style-type: none"> ➤ <i>Stanik snehan</i> (local oleation) with <i>Mahanarayan taila</i> around affecting shoulder joints and upper arm for 5 days ➤ <i>Stanik swedan</i> (local sudation) with <i>Dasmoola bharad</i> around affecting shoulder joints and upper arm for 5 days for 5 days,
3	21/12/2021	1 st sitting of Leech therapy (Total seven leeches on affected sites).
4	27/12/2021	2 nd sitting of Leech therapy (Total seven leeches on

		affected sites).
5	05/01/2022& 14/01/2022	Follow up course in OPD

Table 2
Showing gradation parameters for assessment criteria.¹³

Parameter	Finding	Score
Pain	No pain	0
	Mild pain – particularly on moving the shoulder, able to continue routine work with difficulty.	1
	Moderate pain- Pain felt on movement at rest interfering with routine.	2
	Severe pain – Felt on movement and also at rest, disturbing sleep, unable carry out most of the routine work.	3
Stiffness	No stiffness	0
	Mild stiffness- Particularly on moving the shoulder, able to continue routine work with difficulty.	1
	Moderate stiffness - Pain felt on movement at rest interfering with routine.	2
	Severe pain - Felt on movement and also at rest, disturbing sleep, unable carry out most of the routine work.	3
Range of Movement	Before Leech Therapy	Painful Incomplete
	After Leech Therapy	No Pain Improved Range

Table 3
Shows Gross efficacy of therapy

OVER ALL RESPONSE	Percentage %
Mild improvement	below 25% in relief of pain and stiffness, simultaneously improvement of range of motion below 25%
Good improvement	25%-50% improvement in symptoms like pain and stiffness as well as range of motion.
Very good	51% to 75% remission as well as improvement in range of motion.
Excellent	76% to 100% reliefs of symptoms have been taken into consideration as excellent.

Table 4
Shows symptom wise effect of treatment

Symptoms Daywise	Before Leech Therapy					After Leech Therapy										
	1	2	3	4	5	6	7	8	10	11	12	13	14	15	1 st F/U	2 nd F/U
Lt. shoulder joint pain	+++	+++	+++	+++	+++	++	0	0	0	0	0	0	0	0	0	0
Lt. shoulder stiffness	+++	+++	+++	+++	+++	++	+	++	++	++	+	0	0	0	0	0
Difficulty in movements	+++	+++	+++	+++	+++	++	+	++	++	++	+	0	0	0	0	0
RANGE OF MOVEMENTS	Before Leech Therapy (Painful and Incomplete Range of Movement)					After Leech Therapy (Improvement in Range of Movement)										
Flexion	40°					80°										
Extension	15°					70°										
Abduction	30°					90°										
Adduction	30°					70°										
External rotation	50°					90°										
Internal rotation	40°					80°										

Figures

Figure 1. ROM (20 degree) before treatment



Figure 2. Leech therapy at shoulder joint.



Figure 3. ROM (improved upto 70degree) After treatment

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