



Case Report

Effect of *Nadi svedana* with simultaneous passive stretching on correction of *sandhijadya*Mansi M. Patel ^{a, *}, Manish V. Patel ^b, S.N. Gupta ^b, Kalapi B. Patel ^a^a Dept. of Panchakarma, J S Ayurveda College, College Road, Nadiad, 387001, Gujarat, India^b Dept. of Kayachikitsa, J S Ayurveda College, College Road, Nadiad, 387001, Gujarat, India

ARTICLE INFO

Article history:

Received 19 April 2017

Received in revised form

5 July 2017

Accepted 20 July 2017

Available online 1 February 2018

Keywords:

Contracture

Nadi svedana

Passive stretching

Ama vata

Rheumatoid arthritis

ABSTRACT

Severe knee flexion contracture greater than 80° is rare and challenging to manage. It is a common complication which occurs after a prolonged course of the rheumatoid arthritis. The case was a 45 year old female patient of *Ama vata* (rheumatoid arthritis) with *sandhijadya* and *sankocha* (contracture deformity) who was hospitalized for 2 months. She was unable to walk since 1 year due to contracture of both knee joints. The patient came on a wheel chair and was unable to walk even with support. She was advised for contracture repair surgery which she refused. After hospitalization she was treated with *Nadi svedana* twice a day for 20 min each. Simultaneously, passive stretching for 45 s in every 5 min interval was done. She was treated for 2 months. The patient was instructed to continue other Ayurvedic remedies given as the *Ama vata* (rheumatoid arthritis) treatment. After *Nadi svedana*, goniometric assessment of the knees contracture was performed every week. She got satisfactory result in stiffness and pain and has been able to walk with support. Extension of both knee joints has improved up to 20° with increased range of motion. Her height has also been increased up to 1.5 cm due to improvement in the extension of the knee joints with better feeling in daily activities during 3 months of follow-up period.

© 2017 Transdisciplinary University, Bangalore and World Ayurveda Foundation. Publishing Services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Svedana is the main therapeutic procedure for a number of disorders especially *vata* and *kapha* predominant diseases [1]. *Charaka Samhita* has included *svedana karma* under *shadupakrama*, where it is described as a principal method of treatment [2]. *Svedana* reduces *sandhijadya* (stiffness or contracture), *gaurava* (heaviness) and *shaitya* (coldness) [2]. *Svedana* also has *Ama pachana* action and plays an important role in the treatment of the diseases caused by *Ama*. Joint contractures develop in the patients of rheumatoid arthritis with a prolonged course of the disease. Contractures are the chronic loss of joint motion due to structural changes in non-bony tissues, characterized by reduction in joint range of motion (ROM) or an increase in resistance to passive joint movement. Both of these are limiting joint mobility [3]. It is the

shortening or stiffening of the muscles, skin or connective tissues that result in decreased movement and range of motion.

In Ayurveda, *sankocha* (contraction, shrinking or shriveling), *shula* (pain during movement), *jadya* (stiffness) and *sandhihanana* (loss of structure and function of joint) are mentioned as joint related pathological conditions [4]. Amongst these, *sankocha* and *jadya* can be considered as contracture deformities mentioned in modern medicine. *Laghu*, *ruksha* and *shita guna* of *vata* and association of *Ama* are responsible for these deformities in the patients of rheumatoid arthritis. *Svedana* causes *Ama pachana* and reduces the *shita guna* of *vata* as well as *jadyata* and hence it can be useful in the treatment of contractures developed in patients of long term rheumatoid arthritis. Previous studies didn't show satisfactory clinical results in correcting these deformities because residual flexion contractures were not corrected within a short period of time [5,6]. We here report a case of a patient with 40–50° of bilateral knee flexion contracture due to long term rheumatoid arthritis, which was partially corrected by using a *svedana* with simultaneous passive stretching for a period of 8 weeks.

* Corresponding author.

E-mail: mansi.patel77@yahoo.com

Peer review under responsibility of Transdisciplinary University, Bangalore.

2. History and presenting concerns

A 48 year old female patient came to the hospital with multiple joint pain, stiffness and swelling which started from toes and spread to ankle, knee, wrist, elbow and shoulder joints since last 9 years. She suffered some associated features, like febrile feeling, decreased appetite, disturbed sleep, and stickiness in stool. Before coming to our center, she has taken various treatments from different hospitals. Firstly, she took allopathic treatment which included analgesics, immune-suppressants and corticosteroids. After taking this treatment, she suffered many complications. Then she took Ayurvedic treatment from another Ayurveda clinic for 1 year but did not get much relief. She was advised for the contracture repair surgery which she had refused and came to this hospital in May 2016 with complaints of severe pain and contractures in both knee joints. She came on wheel chair and was unable to walk due to contracture and restriction of movement in knee joints since 1 year.

3. Clinical findings

Patient was fully conscious and looking anxious with normal rhythmic pulse 84/min and respiratory rate 20/min. Blood pressure was 110/76 mmHg while weight was 58 kg (lost 14 kg weight within last 2 years). Body temperature was 98.4 °F. Her height was also reduced because she was unable to extend the knees fully during the standing position. It measured as 151.5 cm which was 154 cm before development of contracture. Height of the patient was measured with the help of flexible measure tape during the supine position. Para-articular muscle wasting was present along with fixed flexion of both knee joints. She was unable to extend the knees fully. Right knee extension was possible up to 140° whereas left knee extension was up to 120°. Movements of both the hip joints were nearly normal. Mild raised local temperature without synovial effusion in both knee joints was noted.

4. Investigations

Before starting the treatment, investigation was done i.e. CRP-40, RA factor-62.14 (positive), Hb-10.5 gm% and ESR-93 mm/h. X-ray of both the knee joints (AP and lateral view) suggested inflammatory joint disease with complete loss of joint space and severe fixed flexion contracture was noted nearly at 45° in right knee and at 60° in left knee (According to a radiologist's report of the X-ray done on 6th of November 2015 at private X-ray clinic).

5. Therapy and timeline

Patient was in *nirama avastha* of *Ama vata*. *Nadi svedana* was performed on both knee joints one by one twice (morning and evening) in a day for a period of 20 min in each joint. Simultaneous passive stretching was also done manually every day for 45 s on both the knee joints one by one in every 5 min interval. This therapeutic procedure was performed every day for a period of 2 months. During the *svedana* process steam developed from plain

water was utilized for *svedana* with the help of special instrument which contains *nadi* (tube) attached with shower.

Patient was instructed to continue other Ayurvedic remedies given for the *Ama vata* (rheumatoid arthritis) treatment. They are as follows:

1. *Pippali churna* – 1 g twice a day with warm water
2. *Rasnapanchaka kvatha* – 40 ml twice a day
3. *Kaishora guggulu* – 3 tablets (350 mg each) three times a day
4. *Yogaraja guggulu* – 3 tablets (350 mg each) three times a day

6. Outcomes and follow-up

After 2 months, she got satisfactory relief in the pain as well as stiffness in both knee joints and was able to walk on with support. She was able to walk little with support after 30 days of treatment. ROM of both knee joints was increased with easy feeling and pain during movement was less and bearable. End feel during ROM of the joint, which is accomplished by performing a passive stretch to a patient's comfortable end range was springy which was rock-hard before starting the treatment. It indicates improvement in the elasticity of the muscles. ROM assessed by goniometre suggests 20° improvement in the extension of right knee and 30° in left knee extension. Right knee extension improved from 140° to 160° and left knee from 120° to 150°. Height also increased up to 1.5 cm and now her height measured 153 cm which was 151.5 cm at the time of admission.

Post-hospitalization, patient has continued to take oral Ayurvedic medicine for *Ama vata* (rheumatoid arthritis) for 3 months. She is happy with satisfactory knee movements and walking with support without performing any surgery (see Table 1).

7. Discussion

Rheumatoid arthritis is a chronic inflammatory disorder characterized by synovial hyperplasia and resulting joint destruction. The knee is among the most commonly affected joints in RA, and it is estimated that up to 90% of patients with RA will eventually have the involvement of knees [7]. Among those patients, progressive destruction of joints leads to the occurrence of flexion contracture in both of their knees and thus these patients are deprived of ambulation for long periods of time [8–10].

In modern conventional medical system, only total knee arthroplasty gives the result in this type of cases. Medicinal treatment can't give satisfactory results [10]. Although total knee arthroplasty could have been performed in this challenging patient [11], intra-operative correction of severe flexion deformity presented a challenging situation for orthopedic surgeons [12]. Authors didn't find any research article of Ayurveda field on correction of this deformity as per the available sources. Patients of *amavata* (rheumatoid arthritis) being treated with satisfactory result in this hospital since many years but didn't observe outcomes on the contracture deformities developed as a complication of rheumatoid arthritis.

Table 1
Outcomes of the therapeutic process in contracture of the knee joints.

Characters	Right knee joint		Left knee joint	
	Before treatment	After treatment	Before treatment	After treatment
Fixed flexion contracture	40°	20°	60°	30°
Passive extension of joint	140°	160°	120°	150°
End feeling during ROM	Rock-hard	Springy	Rock-hard	Springy
VAS for painful joint movement	4	3	8	4

According to Ayurveda, *sheeta* and *vishada guna* of *vata* and association of *ama* are responsible for these deformities in patients of rheumatoid arthritis. As described earlier, *svedana* is the treatment which is indicated to reduce vitiated *vata dosha* as well as for *Ama* conditions. It causes *Ama pachana* and reduces the *shita guna* of *vata* as well as *jadyata* and hence it can be useful in the treatment of contractures developed in patients of long term rheumatoid arthritis. Local hyperthermia produced during *svedana* improves blood circulation and local blood tissue metabolism [13]. Hyperthermia reduces inflammation by modifying the movement of various inflammatory mediators [14]. Hyperthermia relaxes musculature by physical effect of heat and thereby reduces pain. Passive stretching simultaneously with *svedana* can be additionally helpful in relieving the contractures.

Total knee arthroplasty is a complex surgical procedure which requires average cost of \$5000–7500 and nearly 100,000–200,000 INR in India. With presenting case, satisfactory outcomes of this therapy promises cost effectiveness for the patients of post rheumatoid arthritis knee joint contracture. Health and socioeconomic impact and the need for updated evidence-based non-surgical alternative treatment of the disease as well as safe, cost-effective and impressive effect of this treatment can make this single case report of particular interest.

Sources of funding

None.

Conflict of interest

None

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jaim.2017.07.002>.

References

- [1] Agnivesha Charaka, Dridhabhal. In: Rajeshvardattashashtri, editor. Charaka Samhita with Vidyotinihindi commentary of Kashinathshashtri and Gorkhnath Chaturvedi, Sutra Sthana 14/08. Varanasi: ChaukhambhaVidyabhan; 1969. p. 282.
- [2] Agnivesha Charaka, Dridhabhal. In: Rajeshvardattashashtri, editor. Charaka Samhita with Vidyotinihindi commentary of Kashinathshashtri and Gorkhnath Chaturvedi, Sutra Sthana 22/04. Varanasi: ChaukhambhaVidyabhan; 1969. p. 428.
- [3] Katalinic OM, Harvey LA, Herbert RD, Moseley AM, Lannin NA, Schurr K. Stretch for the treatment and prevention of contractures. Cochrane Database Syst Rev 2010;3, CD007455.
- [4] Vijayrakshit-Shri kanthdatta. In: Madhavnidan, commentary of Madhukosha, 25/10. Ahmadabad: Sarasvatipustakbhandar; 1996-97. p. 684.
- [5] Lu H, Mow CS, Lin J. Total knee arthroplasty in the presence of severe flexion contracture: a report of 37 cases. J Arthroplasty 1999;14:775–80.
- [6] Abe S, Kohyama K, Yokoyama H, Matsuda S, Terashima Y, Nakagawa N, et al. Total knee arthroplasty for rheumatoid knee with bilateral, severe flexion contracture: report of three cases. Mod Rheumatol 2008;18:499–506.
- [7] Kajino A, Yoshino S, Kameyama S, Kohda M, Nagashima S. Comparison of the results of bilateral total knee arthroplasty with and without patellar replacement for rheumatoid arthritis - a follow-up note. J Bone Jt Surg Am 1997;79A(4):570–4.
- [8] Aglietti P, Windsor RE, Buzzi R, Insall JN. Arthroplasty for the stiff or ankylosed knee. J Arthroplasty 1989;4(1):1–5.
- [9] Chmell MJ, Scott RD. Total knee arthroplasty in patients with rheumatoid arthritis. An overview. Clin Orthop Relat Res 1999;366:54–60.
- [10] Tew M, Forster IW. Effect of knee replacement on flexion deformity. J Bone Jt Surg Br 1987;69(3):395–9.
- [11] McPherson EJ, Cushner FD, Schiff CF, Friedman RJ. Natural history of uncorrected flexion contractures following total knee arthroplasty. J Arthroplasty 1994;9(5):499–502.
- [12] McGrath MS, Mont MA, Siddiqui JA, Baker E, Bhave A. Evaluation of a custom device for the treatment of flexion contractures after total knee arthroplasty. Clin Orthop Relat Res 2009;467(6):1485–92.
- [13] Shirota H, Goto M, Katayama K. Application of adjuvant local hyperthermia for evaluation of anti-inflammatory drugs. J Pharmacol Exp Ther 1988 Dec;247(3):1158–63. PMID: 3264574.
- [14] Brosseua L, Yongue KA, Robinson V, Marchand S, Judd M, Wells G, et al. Thermo therapy for treatment of osteoarthritis. Cochrane Database Syst Rev 2003;(4), CD004522. <http://dx.doi.org/10.1002/14651858.CD004522>. PMID: 14584019.