Journal of Ayurveda and Integrative Medicine 12 (2021) 540–543

Contents lists available at ScienceDirect

Journal of Ayurveda and Integrative Medicine

journal homepage: http://elsevier.com/locate/jaim

Case Report

Management of nasal synechiae with *Kshara Sutra* - A case report

K. Sivabalaji [a, *], Ashitha Ali [a], Ashwini BN [a], Anandaraman PV [b], Rabinarayan Tripathy [c]

[a] Dept. of Shalakya Tantra, Amrita School of Ayurveda, Amrita University, Amritapuri, India
[b] Dept. of Panchakarma, Amrita School of Ayurveda, Amrita University, Amritapuri, India
[c] Dept. of Shalya Tantra, Amrita School of Ayurveda, Amrita University, Amritapuri, India

ARTICLE INFO

Article history:
Received 20 June 2020
Received in revised form
27 March 2021
Accepted 30 March 2021
Available online 5 August 2021

Keywords:
Nasal adhesion
Ayurvedic intervention
Nasavarthi
Kshara Sutra
Nasal obstruction

ABSTRACT

Nasal synechiae or nasal adhesions are among the most common unwanted outcomes following functional endoscopic sinus surgery (FESS) with an incidence rate of 10%–40%. Approximately 500,000 patients per year undergo FESS for the treatment of chronic rhinosinusitis (CRS). A wide number of research studies support the utility of endoscopic sinus surgery to improve health-related quality of life (HRQoL) in patients with CRS. However, failures are still reported at a rate up to 26%. About 50% who present with synechiae in the middle meatus require revision endoscopic sinus surgery. A case report of a 48-year old-male has been presented here with complaints of nasal blockage and difficulty in breathing, diagnosed as nasal synechiae after anterior rhinoscopy and endoscopic examination and managed with Ayurvedic intervention. *Kshara karma* with *Apamarga Kshara* is the choice of management in case of nasal polyp and turbinate hypertrophy [1]. But in nasal synechiae, since we have to cut open the adhesion precisely, *Kshara Sutra,* which is meant for cutting open the tract in case of fistula-in-ano was chosen. Nasal synechiae which was managed only with electrocautery or other surgical procedures where there is a chance of recurrence can be successfully managed with an Ayurvedic intervention viz., *Kshara Sutra* which is strictly new to this site of occurrence (nose).

1. Introduction

Synechiae are one of the most common unwanted outcomes following functional endoscopic sinus surgery (FESS), with an incidence rate of 10%–40% [2]. Nasal synechiae or turbinate synechiae is a condition in which there is adhesion of one turbinate to another, to another part of same turbinate, to the lateral wall or less commonly to the nasal septum [1]. It is typically a complication of chronic nasal lesions with epithelial ulceration or other mucosal changes like inflammatory, degenerative, necrotic, hyperplastic or metaplastic lesions. Most of the synechiae tend to involve the inferior or middle turbinate. Patients undergoing primary FESS and NSR (nasal septal reconstruction) are at greatest risk of developing post-operative synechiae [3]. There is no similar reference in Ayurvedic classics which resembles nasal synechiae in its pathologic aspect; however it can be correlated with *nasaprathinaha* as the main symptoms include difficulty in breathing and blocked nose with narrowing of the passage. Various studies have been conducted evaluating the incidence of synechiae post-operatively, its impact on quality of life, and various methods to prevent its occurrence; however, no studies have been reported regarding the management of synechiae or its recurrence after surgical correction. *Kshara Sutra*, a treatment modality specifically mentioned in Ayurvedic classics for the management of fistula-in-ano can be adopted in synechiae as the condition is to be managed by separating the adhesion in which we can find two openings either superiorly and inferiorly or medially and laterally [4].

Kshara Sutra is a medicated thread (seton) coated with herbal alkaline drugs like *Apamarga Kshara* (ash of *Achyranthus aspera*), *Snuhi* (*Euphorbia nerifolia*), latex, and *Haridra* (*Curcuma longa*) powder in a specific order. This combination of medicines on the thread helps in debridement and lysis of tissues, exerts anti-fungal, anti-bacterial, and anti-inflammatory actions [5].

2. Case report

A 48-year-old, moderately built male patient came to ENT OPD with complaints of severe blocked nose and difficulty in breathing

* Corresponding author.
E-mail: balajisiva85k@gmail.com
Peer review under responsibility of Transdisciplinary University, Bangalore.

https://doi.org/10.1016/j.jaim.2021.03.010

associated with mild anosmia. On examination left maxillary sinus tenderness was present. Anterior rhinoscopic examination showed presence of nasal synechiae on left nostril which resulted from adhesion of inferior turbinate with nasal septum which was then confirmed with endoscopic examination. He had a history of nasal blockage for which he took allopathic consultation and was advised for electrocautery. Patient was not willing to undergo electrocautery due to high chance of recurrence and hence a new way to cut open the synechiae was sought. Application of *Kshara Sutra* followed by nasal packing with *Apamarga ksharatailam* and *nasavarthi* (nasal splinting with medicated wick) using *Ghondaphaladi varthi* was planned. *Kshara Sutra* was aimed at cutting open the synechiae, nasal packing with *Apamarga ksharatailam* in preventing further adhesion and for proper healing and *Ghondaphaladi nasavarthi* for further cutting of tissues and proper healing as in case of *naadivrana* (sinus ulcers). *Kshara Sutra* was applied and the thread was tightened every 4th day. After 3 weeks (6 sittings) the synechiae was fully cut open after which nasal packing with *Apamarga ksharatailam* was carried out for 7 days. Later, *Nasavarthi* was kept in the space between the inferior turbinate and septum of left nostril for two weeks. Table 1 represents the detailed timeline of the treatment.

2.1. Poorvakarma (Pre-procedure)

LOX 10% spray was sprayed in the left nasal cavity to anaesthetize the synechiae and nasal mucosa. All the aseptic precautions were maintained throughout the procedure.

2.2. Pradhanakarma (Procedure)

A long metallic malleable probe [Fig. 1] was introduced through the inferior opening and attempted to pass the tip of probe through the superior opening. Care was taken not to create false passage. One end of probe was threaded with *Kshara Sutra* and passed through the inferior portion of synechiae and taken through the superior portion with needle holding forceps. Then the probe was gently withdrawn, so the entire tract was threaded with medicated *Kshara Sutra*. The two ends of the thread were then comfortably tied using two knots on the inferior aspect of synechiae [Fig. 2].

2.3. Paschat karma(Post-procedure)

The part of the thread extending from the knots was carefully covered with gauze pad and nasal packing was done to prevent contact of *Kshara Sutra* with septum and lateral wall of nose. Proper care was taken to prevent further synechiae formation resulting from contact of mucosal surfaces of septum and turbinates. On every fourth day, thread was changed and the procedure was continued for 3 weeks until the synechiae was fully cut open. *Apamarga ksharatailam* (1 week) and *Ghondaphaladi nasavarthi* (2 weeks) was also done as post-procedure after *Kshara Sutra*.

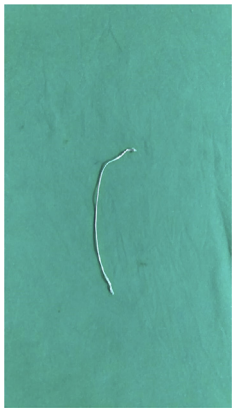

Fig. 1. Metal probe.

2.4. Follow up

Follow-up was done once in a month for 6 months. In every follow-up visit, endoscopic examination was done along with anterior rhinoscopic examination to check for recurrence of synechiae. No recurrence was noticed up to 6 months. Patient had marked relief in symptoms like nasal blockage and difficulty in breathing which sustained throughout the follow-up period. Later, 7th and 8th follow-up was carried out once in 3 months and the patient was symptom-free.

3. Discussion

Kshara karma is being widely practiced now-a-days in *Shalakya rogas* (diseases pertaining to region above neck) like *tundikeri* (tonsilitis), *nasarshas* (nasal polyp) and *nasa pratinaha* (turbinate hypertrophy). In all these conditions, *Apamarga Kshara* (alkali prepared out of *A. aspera*) or *Tankana Kshara* (borax) is the drug of choice. No reference for similar condition like nasal synechiae is available in Ayurvedic classics. *Kshara* applications like that on nasal polyp is not feasible here since there is chance of recurrence of synechiae. Also, the posterior extend of synechiae was not visible with endoscopic examination and hence, the normal *kshara* procedure was thought to be insufficient in this case.

It is an accepted fact, based on various studies, that average unit cutting time with *Kshara Sutra* is 1 cm/week in fistula-in-ano and the *Kshara Sutra* is therefore changed once a week. In our case, we have tightened the *Kshara Sutra* every fourth day. The unit cutting time depends on various factors like the concentration of the drug, tissue of the tract and pressure applied by the *Kshara Sutra* on the tract. In this case, since we tightened the *Kshara Sutra* every fourth day, good pressure was exerted on the sinus. It was considered appropriate to reduce the time to 4 days as it was not an anal fistula, and there was less chance of contamination of the tract since it was not connected to the anal canal. The changing of *Kshara Sutra* every

Table 1
Timeline.

S.No	Treatment adopted	No of days	Outcome
1	*Kshara Sutra*	Total- 3 weeks (6 sittings) Thread tightening- every 4th day	Synechiae cut open
2	*Apamarga Ksharataila*	7 days	Wound healed completely
3	*Ghondaphaladi Nasavarthi*	14 days	Proper spacing of the nasal passage

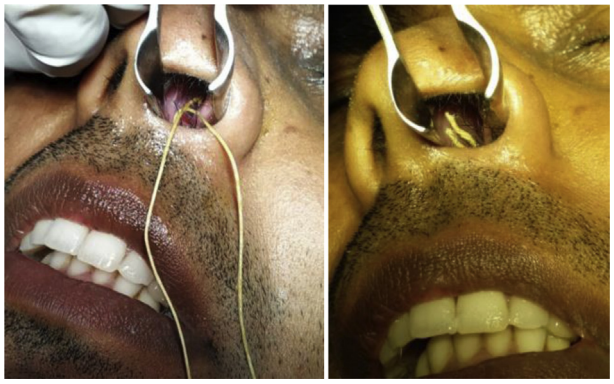

Fig. 2. Application of KsharaSutra.

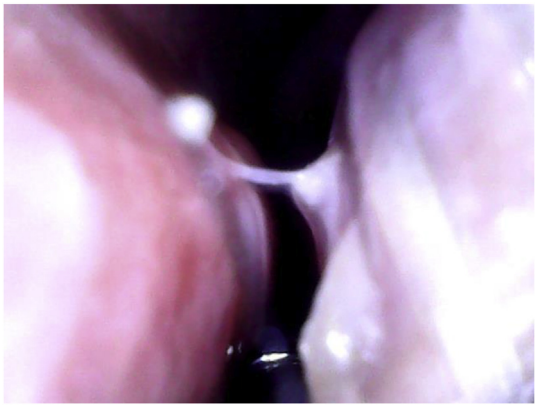

Fig. 4. Post treatment.

4th day was repeated till the *Kshara Sutra* got cut through the tract completely and the duration of procedure depended only on extend of adhesion.

The *Kshara Sutra* threading is a minor procedure and could be carried out at OPD level. The expenses required for this procedure are very low and there is no need to hospitalize the patient for longer duration. The standard *Kshara Sutra* is prepared by 11 coatings of *Snuhi* latex (*E. nerifolia*), 7 coatings of *Snuhi* latex and *Apamarga Kshara* (*A. aspera*) and last 3 coatings of *Snuhi* latex and *Haridra Churna* (*C. longa*) [6]. The *Apamarga Kshara Sutra* is well-proven to be an effective treatment for the management of fistula-in-ano. It has been standardized by Central Council for Research in Ayurvedic Sciences (an apex research organization of Government of India) in the field of Indian systems of medicine [7]. *Snuhi Ksheera* possesses *Shodhana* as well as *Ropana* properties. Considering the *Rasa Panchaka* of the drugs, *Apamarga, Snuhi*, and *Haridra* all are possessing *Katu and Tikta*; *Ushna -Virya*; *Katu -Vipaka* and *Kapha-Pitta* Shamaka properties.

Since the procedure was under local anaesthesia by LOX 10% spray, there was only bearable pain sensation even after the procedure. The thread was not tightened similar to *Kshara Sutra* in fistuala-in-ano as only *ksharana* or necrotizing tissue was aimed instead of *ksharana* and *chedana* as in case of *bhagandhara*. Also sitz bath like procedure for pain management adopted during thread changing in fistula-in-ano was not necessary since every thread change was carried out after local anesthesia.

Nasal packing with *Apamarga ksharatailam* helps in shrinkage of the thickened mucosal area thereby increasing the cavity space [8]. *Ghondaphaladivarthi* is mentioned in *Susrutha Samhitha nadeevrana chikitsa* and was prepared with *Ghondaphalatwak* (*Ziziphus xylopyrus*), *pancalavana* (rocksalt/sodium chloride, lakesalt, blacksalt, sodi muras, and unaqua sodium chloride), *laksha* (*Laccifer lacca*), *pugiphala* (*Areca catechu*), *patram (Cinnamomum zeylanicum)* and *ksheera* (latex) of *snuhi* (*E. nerifolia*) and *arka* (*A. aspera*) [9]. The powdered drugs were mixed with *ksheera* of *arka* and *snuhi* and *varthi* of suitable size to be kept in the cut space was prepared and dried [Fig. 3]. All drugs are having *lekhana* and *ropana* properties and the *varthi* was used as *nasavarthi* helped in further increasing the space of nasal cavity and proper healing of the cut open wound [Fig. 4]. X-Ray PNS taken after this procedure shows left maxillary sinus was intact with clear nasal cavity [Fig. 5].

In previous studies comparing the efficacy of Mitomicin C and Teflon Nasal Septal Splint in treating and preventing recurrence of nasal synechiae after surgical synechiolysis, follow-up evaluation was done in 1 week, 1 month, 2 months [10]. However, in this case, the follow-up was done once in a month for 6 months and no

Fig. 3. Preparation of Khondaphaladi Nasa varthi.

Fig. 5. X-ray post treatment.

recurrence was noted within that period. Symptoms of nasal blockage and breathing difficulty were markedly reduced and anosmia was completely relieved. Later, on 7th and 8th follow-up (once in 3 months) the patient was symptom-free.

4. Conclusion

Nasal synechiae is a condition with considerable incidence despite of the emergence of various preventable measures adopted post-operatively like septal splints, nasal packings, application of mitomycin-C etc. *Kshara Sutra* in management of nasal synechiae will be a breakthrough as it is a condition which was thought to be managed only by surgical correction or cauterization.

Patient consent

Consent for publication of this case study has been obtained from patient.

Source(s) of funding

None.

Conflict of interest

None.

References

[1] Kotrannavar VK, Angadi SS. Kshara application for turbinate hypertrophy. J Ayurveda Integr Med 2013 Oct;4(4):241–4. https://doi.org/10.4103/0975-9476.123722. PMID: 24459392; PMCID: PMC3891181.
[2] Chambers DW, Davis WE, Cook PR, Nishioka GJ, Rudman DT. Long-term outcome analysis of functional endoscopic sinus surgery: correlation of symptoms with endoscopic examination findings and potential prognostic variables. Laryngoscope 1997 Apr;107(4):504–10.
[3] Psaltis AJ, Soler ZM, Nguyen SA, Schlosser RJ. Changing trends in sinus and septal surgery, 2007 to 2009. Int Forum Allergy Rhinol 2012 Sep-Oct;2(5):357–61.
[4] Chikitsa sthana 17th chapter. Varnasi: chaukambha surbharati prakashanYadavji Vaidya, Acharaya Trikamji, editors. Sushruta Samhita Nibhndha Sangraha Tika Dhalana 2003:468 [Google Scholar].
[5] Dwivedi AP. Management of pilonidal sinus by Kshar Sutra, a minimally invasive treatment. Int J Ayurveda Res 2010 Apr;1(2):122–3. https://doi.org/10.4103/0974-7788.64408. PMID: 20814527; PMCID: PMC2924975.
[6] Kumar PH, Sahu M. Role of Aragvadhadi sutra in the management of fistula -in-Ano. Ancient Sci Life 2000 Jan;19(3–4):110–2. PMID: 22556930; PMCID: PMC3336432.
[7] Dwivedi AK, Chaudhary M, Kulshreshtha DK, Sarin JP. Standardization of ksharasutra. J Res Ayurveda Siddha 1991;12:85–92 [Google Scholar].
[8] Vij Akshay, Sharma Muralidhara, Bhat Prashanth, Sunil Kumar KN. Standardization of apamargakshara taila. Int J Res Ayurveda Pharm May-Jun 2016;7(3):40–5. https://doi.org/10.7879/2277-4343.073109.
[9] Yadavji Vaidya, Acharaya Trikamji, editors. Chikitsa sthana 17th chapter. Varnasi: chaukambha surbharati prakashan. Sushruta Samhita With Nibhndha Sangraha Tika Of Dhalana; 2003. p. 468 [Google Scholar].
[10] ClinicalTrials.gov [Internet]. Bethesda (MD): National Library of Medicine (US). 2000 Feb 29- Identifier: NCT00966056, Study of Mitomycin C and Nasal Splint to Treat Nasal Synechiae; 2009 August 29; Available from: http://clinicaltrails.gov/ct2/show/NCT00966056