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Management of Intersphincteric Fistula with *Ksharasutra* using the Samsung Medical Center Knot along with Oral Medicines: A Case Report

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ABSTRACT:

Fistula-in-Ano is a condition characterized by an abnormal connection between the anal canal and the external epithelium. *Ksharasutra* therapy has been a minimally invasive treatment in the management for fistula-in-Ano. Conventionally it is applied using a reef knot. And internalization of the external opening after few weeks of cutting through the tissues can create difficulty in proper application of the ksharasutra. Samsung medical center knot (SMC Knot) is used in laparoscopic and arthroscopic surgeries for extracorporeal knot tying. A 49-year-old male with an intersphincteric fistula underwent *Ksharasutra* therapy. The internalization of the external opening after two weeks complicated the thread replacement as well as providing optimum tension. The SMC knot was applied in this case. It allowed extracorporeal tying of the knot and could slide in to position to provide desired tension. The result demonstrates that the cutting efficiency was enhanced post- SMC knot application. This case highlights the integration of surgical methods into Ayurvedic practices which can enhance adaptability of ksharasutra therapy for personalized treatments and provide better outcomes.

KEY WORDS: *Bhagandara*, Extracorporeal, Fistula in ano, *Ksharasutra*, Sliding knot, SMC knot.

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INTRODUCTION:

Ksharasutra therapy is an ayurvedic management for *Bhagandara* or fistula in Ano.[1] It is a minimally invasive technique using medicated thread to gradually cut and heal the fistula tract. It is gaining popularity due to its very low rate of recurrence. It facilitates micro incision of the tissue, promotes drainage of the abscess and assists in the proper healing of the tract. Using the rail-road technique, the old thread in the fistula tract is replaced with a new one, once

or twice in a week. Attaining optimum loop circumference and required tension can become difficult in cases where the external opening is in close proximity of the anal verge. This hurdle is attempted to overcome with application of an extracorporeal Samsung Medical Center (SMC) knot using ksharasutra in a case of intersphincteric fistula in Ano. SMC knot is commonly used in laparoscopic and arthroscopic surgery. The knot is tied from outside and can be slipped into required position. The utilization of this method in ksharasutra therapy have never been reported in any prior literature. Double thread method, that is an additional plain thread with longer length is placed along with the ksharasutra to facilitate thread changes.

CASE REPORT:

A 49-year-old male approached the hospital with complaints of pain over the perianal region for the past 6 months and discharge of pus from the same region for the past 2 months. He consulted an allopathic hospital 6 months ago, on the onset of pain and got temporary relief on consuming internal allopathic medication, but the pain increased gradually. He consulted another hospital 2 months ago as he noticed discharge of pus. He was recommended MRI and surgery was advised. As he was unwilling to undergo surgery, he consultedthe hospital. Patient had no comorbidities, nor was he under any other medications.

Clinical findings

Patient had a well built and adequately nourished body, and vital signs were stable. He had good appetite and regular formed bowel, with a slight tendency towards occasional hard stools. Inspection of the perianal region revealed an external opening at 9 'O' clock position, approximately 2 cm away from the anal verge. Grade II tenderness was elicited on palpation around the external opening and cord like induration felt from the external opening towards the anal verge. A dimple indicating an internal opening was noted at 6- 7 'O' clock position on per rectal examination. On probing the probe went towards the 9 'O' clock position indicating the course of fistula.(Table 2)

Investigations and Diagnosis

MRI taken on 5th June 2024 revealed Well defined Thick-walled posterior perianal fistula. This tract seen coursing antero-superiorly in the right ischioanal region entering into the intersphincteric plane at 6 'o'clock position coursing more superiorly in the intersphincteric plane forming a horseshoe ramification extending from 9-4 o'clock position with possible opening into the anal canal at 7 o'clock position. The MRI findings were consistent with the diagnosis of an intersphincteric fistula with a horseshoe configuration. Hematological investigations revealed values with in normal range. (Table 2)

Materials and methods

The extent of fistula suggested that invasive intervention over conservative treatment, is necessary to manage the condition. Nevertheless, internal medicines which are beneficial for management of Bhagandara (fistula in Ano) were administered (Table 3). Ksharasutra was applied with an initial total length of 12 cm. Following the first thread change, the total length of the loop was found to be 5.1 cm. The ksharasutra was changed twice in a week and a net cutting rate of 1.05 cm per week was observed for the following two weeks. The cutting from the external opening was rapid and ksharasutra loop proceeded internally. As a

result, even the external opening moved inside the anal verge. This imparted difficulty in changing the ksharasutra.

Double thread

Ksharasutra are changed by tying new ksharasutra to the old one, cutting and pulling the old sutra through railroad technique.[2] Reduced accessibility and visibility of ksharasutra in this case, made it difficult to tie new thread to it. Thus, apart from the ksharasutra of appropriate length, after two weeks, an additional plain thread of ample length (15 cm) is inserted through the fistula tract during each thread change. It is tied with a loop of larger size. During the following ksharasutra changes, old ksharasutra is removed using a suture cutting scissors and new threads were tied to the larger plain thread and pulled through the tract (figure. 1).

Samsung medical center knot [3]

The double thread technique provided easy insertion of the ksharasutra into the fistula tract. But securing the ksharasutra by tying knots with optimum tension became difficult as the external opening is inside the anal canal. This resulted in a larger ksharasutra loop size than desired and reduced the cutting rate remarkably. Just prior to the application of the SMC knot, the loop circumference measured during the last three thread changes were 2.6 cm, 2.5 cm and 2.3 cm. Since both openings were inside the anal canal in this case, the first knot of ksharasutra is placed by SMC knot. It is a sliding knot technique utilized in laparoscopic and arthroscopic surgery. It allows extracorporeal tying of the knot. Pulling one limb will enable the sliding mechanism and the knot will slide into position (figure. 2). This is further secured with a half hitch knot.

OBSERVATIONS AND RESULTS:

The loop circumference measured after each thread changes (Table 4) shows a difference of 0.4 cm to 0.6 cm in the initial couple of weeks, accumulating to a net cutting rate of 1.05 cm per week. But after two weeks the cutting rate was 0.1 cm and 0.2 cm. The SMC knot was applied when the previous loop circumference was at 2.3 cm. After its application the Ksharasutra completely excised through the remaining tissue within 2 days. Dressing the wound with *Jathyadi Grutha* was followed for 1 month until proper healing was attained.

Table -1: Timeline of events

Date	Event	Medication / Intervention
Dec-23	Onset of pain in perianal region	Consulted allopathic hospital, given oral medications, temporary relief noted.
Jun-24	Pus discharge began. Consulted another hospital	MRI advised, surgery recommended.
5th June 2024	MRI performed	MRI revealed intersphincteric fistula with horseshoe configuration.
24th June 2024	Patient approached Ayurvedic hospital	Diagnosis confirmed, conservative Ayurvedic treatment initiated. Internal medicines for Bhagandara started. (Table 3)

2nd July 2024	Ksharasutra therapy initiated	Ksharasutra loop applied with an initial length of 12 cm.
6th July 2024	First thread change	Remaining Ksharasutra loop measured 5.1 cm.
16th July 2024	External opening moved internally, thread change became difficult	Double thread technique introduced with 15 cm plain thread to aid subsequent changes.
30th July 2024	Difficulty in securing knot due to both openings inside anal canal	SMC (Samsung Medical Center) knot technique used for knot tying.
1st August 2024	Thread fell off	Continued internal medication and external application of medicine until healing of wound
27th August 2024	Review examination	Wound healed. Advised to continue Internal medicines only for one more month

Table -2: Clinical findings- Physical examinations, radiological and hematological investigations

Category	**Finding**
1. Local Examination	
• Inspection	External opening seen at 9 o'clock position, approximately 2 cm from the anal verge.
• Palpation	Grade II tenderness around external opening. Cord-like induration palpable from external opening to anal verge.
• Digital Rectal Examination	Dimple suggestive of internal opening noted at 6–7 o'clock position. Probing revealed tract running toward 9 o'clock direction.
2. Radiological Investigations	
• MRI Findings	Thick-walled posterior perianal fistula. Tract courses antero-superiorly in right ischioanal region, enters intersphincteric plane at 6 o'clock. Horseshoe ramification extends from 9 to 4 o'clock. Possible internal opening at 7 o'clock. Diagnosis: Intersphincteric fistula with horseshoe configuration.
3. Blood Investigations	
• Hematology	Within normal limits.

Table -3: Internal and external medicines administered to the patient

sl. No.	route	Medicine	dose	time
1	Internal medicine	Gugguluthiktakam kashaya	15ml kashayam + 45 ml water	twice daily
2		Kaishoraguggulu tab	1 tablet	twice daily with kashaya 1
3		Brhath thriphala choorna	1 table spoon	once daily, bed time with hot water
4	External medicines	Thriphala kashaya sitz bath		twice daily
5		Jathyadi grutha dressing		once daily

Table -4: ksharasutra thread circumferences measured during each thread change

Thread changes	ksharasutra length	Difference in length
day 0	12 cm (total length)	_
day 3	5.1 cm	_
day 7	4.6 cm	0.5
day 10	4 cm	0.6
day 14	3.4 cm	0.6
day 17	3 cm	0.4
day 21	2.6 cm	0.4
day 24	2.5 cm	0.1
day 28	2.3 cm	0.2
day 30	thread fell off	2.3

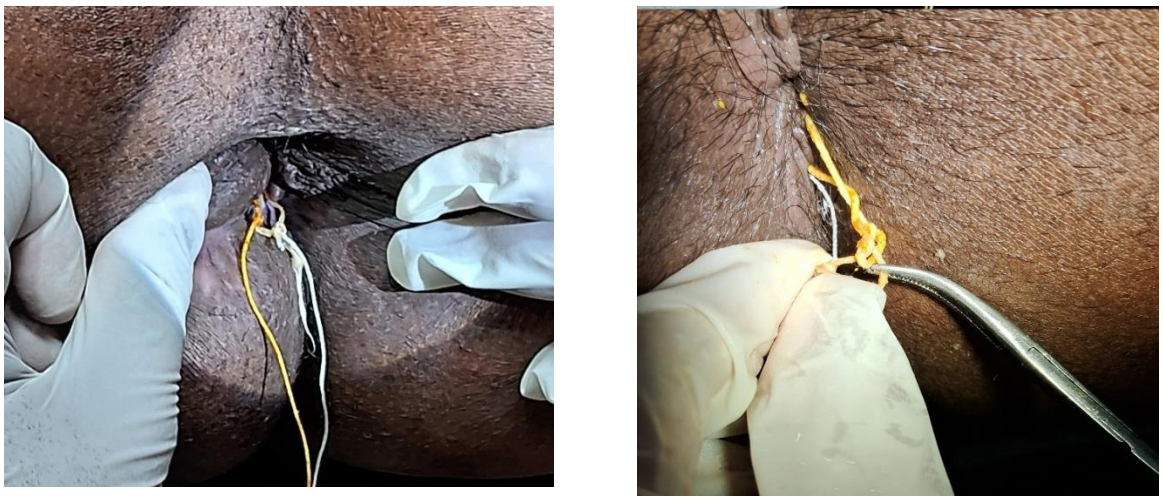

Figure 1: Application of Double thread and SMC knot

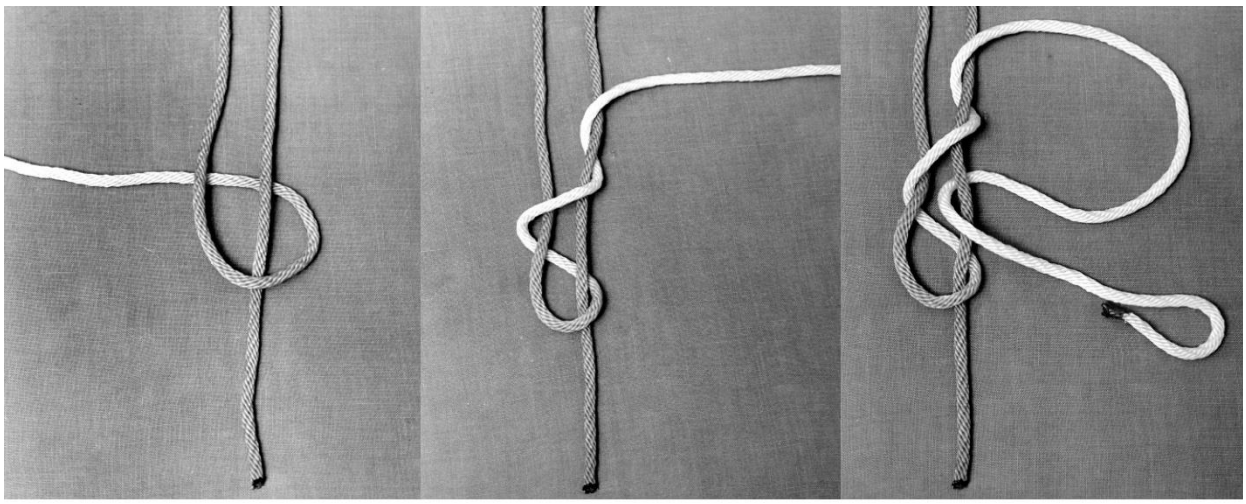

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Figure -2: Steps of SMC knot.

Underhand throw followed by one more underhand throw, and the tail taken through the loop form behind forward and finally through triangle created between the loops and post strand.

DISCUSSION:

SMC knot enables us to tie the knot extracorporeally and then slide it into position. Usually, it is tied using hands with ample length of suturing material and the extra length is trimmed off. But that causes wastage in case of ksharasutra. But this was overcome and only minimal length was required, by using a mosquito forceps for tying the ksharasutra. An optimum loop circumference and adequate tension is necessary to maintain the proximity of ksharasutra with the tissues for mechanical as well caustic cutting to happen [4]. In cases where traditional knot tying methods fails to attain this, SMC Knot can prove beneficial. The internal medicines also play a pivotal role. *Gugguluthikthakam Kashayam* and *kaishoraguggulu* tab help in tissue level cleansing and promote healing while *Bruhat-thriphala choorna* act as a stool softening laxative. The external application of *Thriphala kashaya* sitz bath helps in the removal of pus and other discharges from the tract.[5] Further, the dressing and packing the tract with *Jathyadi Grutha* contributes to the healing of tissues.[6] This proper cleansing and healing prevent the recurrence of the fistula. Furthermore, integration of surgical techniques can increase the potential of ayurvedic therapies. By enhancing the adaptability of ksharasutra, it can facilitate case-based modifications to provide personalized treatments.

CONCLUSION:

Application of the SMC knot in the management of intersphincteric fistula with ksharasutra therapy was found to be beneficial. Especially in this case with internalized external opening, which complicated the traditional knot tying. By utilizing this method, the ksharasutra was positioned with optimum tension and facilitated smooth progression of the cutting process. This case demonstrates the potential of integration of surgical techniques into Ayurvedic practices to provide personalized treatment and improved outcomes in management of fistula-in-Ano.

Limitation of study:

A fairly small learning curve is the limitation of this method. Learning the SMC knot application, especially using minimal thread length is required. Another limit of this study is that it is a single case and thus it lacks generalizability. Elaborate clinical trials with large samples will be required to prove the efficacy and utility of the method. Comparative technical trials on knot integrity, load bearing etc on various types of extracorporeal knots to identify the ideal one for ksharasutra practice can prove to be beneficial.

Declaration of patient Consent:

Written informed consent from the patient was obtained for the publication of this article, including all clinical data and any accompanying images.

Conflict of interest: The author declares that there is no conflict of interest.

Guarantor*:* The corresponding author is the guarantor of this article and its contents.

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