



Research Article

**STUDY THE EFFECT OF PARTIAL FISTULECTOMY WITH ARKAKSHIR BASED KSHARSUTRA LIGATION IN TREATMENT OF BHAGANDARA (FISTULA-IN-ANO) – A PILOT STUDY**

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**ABSTRACT**

In Ayurveda, *Bhagandara* (Fistula-in-ano) is included under the *Ashtomahagada* (eight major diseases) because it is difficult to manage medicinally as well as surgically. *Ksharsutra* is the potent treatment in *Bhagandara* routinely practiced by Ayurvedic surgeons but time period required to cut the tract is too long. Hence now-a-days this procedure is modified as partial fistulectomy with *Ksharsutra* ligation. *Ksharsutra* was prepared as per API guidelines. *Snuhikshir* is replaced by *Arkakshir* and remaining ingredients same as standard *Ksharsutra* preparation. **Methodology:** A total 15 patients of Fistula in ano were enrolled for partial fistulectomy with *Arkakshir* based *Ksharsutra* ligation under spinal anaesthesia. Since post-operative day 1, patients were advised for Sitz bath with *Triphala* decoction daily twice a day. Daily dressing with betadine was done. Proper Laxative *Gandharvahrithakivati* 2 HS was given to relieve constipation. One week later old *Ksharsutra* was replaced with the new one with gradual tightening of *Arkakshir* based *Ksharsutra* by rail-rolled technique. **Result:** Encouraging effects of partial fistulectomy with *Arkakshir* based *Ksharsutra* was noted. Pain, discharge, post-operative wound was significantly reduced. Average Unit Cutting Time (UCT) of fistula tract was 7.68 days/cm. Incontinence and recurrence weren't found in any case in this study. **Conclusion:** Partial fistulectomy with *Arkakshir* based *Ksharsutra* application is said to be the safe and best procedure which promotes early wound healing with sphincter saving method and least recurrence rate.

**KEYWORDS:** Fistula-in-ano, Partial fistulectomy, *Arkakshir*, *Ksharsutra*, *Snuhikshir*.

**INTRODUCTION**

In Ayurveda, *Bhagandara* (Fistula-in-ano) is included under the *Ashtomahagada* (eight major diseases) because it is difficult to manage medicinally as well as surgically<sup>[1]</sup>. In Ayurveda, Acharya has stated pathogenesis of *Bhagandara*; that painful pustule is formed in the one or two finger vicinity of anal canal by vitiating *Rakta* and *Mansa*<sup>[2]</sup>. In *Apakwaavastha* (immature stage) it is known as *Pidaka* and when it becomes *Pakwa* (pus formation) and causes *Daran* (tearing) of *Bhaga* (Perineal), *Guda* (rectum) and *Basti* (pelvis) *Pradesha* it is called as *Bhagandara*<sup>[3,4]</sup>. As per modern science, fistula-in-ano is a track lined by unhealthy granulation tissue and communicating two epithelial lined surfaces which opens deeply into the anal canal or rectum and superficially on the skin around the anus<sup>[5]</sup>. Fistula-in-ano is chronic infectious condition which is due to cryptoglandular infection characterized by chronic purulent discharge in perianal region<sup>[6,7]</sup>. Fistula-in-ano does not heal because of two reasons, Fecal material can enter the primary opening of tract and another Inter-sphincteric fistula tract is compressed

between internal and external sphincter, causing closed septic foci and persistent sepsis<sup>[8]</sup>. In modern era, there are many treatment modalities available like fistulotomy, fistulectomy, Ligation of intersphincteric fistula tract (LIFT), Video assisted anal fistula treatment (VAAFT), fibrin glue, Fistula plug<sup>[9]</sup> but they have their own limitations. Sushruta stated the effect of *Kshar* (Alkaline ash) in *Bhagandara*<sup>[10]</sup>. Also, the Acharya Charaka mentioned *Eshan* (probing) followed by *Patankarmain Bhagandara*<sup>[11]</sup>. Chakrapani and Bhavamishra elaborated the preparation and application of *Ksharsutra* in *Bhagandara* (Fistula-in-ano)<sup>[12,13]</sup>. *Ksharsutra* is the potent treatment in *Bhagandara* routinely practiced by Ayurvedic surgeons but time period required to cut the tract is too long. Hence now-a-days this procedure is modified as partial fistulectomy with *Ksharsutra* ligation. In this process partial fistulectomy is done up to the sphincter muscle and remaining track is ligated by *Ksharsutra* to avoid the cutting of sphincter muscle at a time. In this pilot study 15 patients of *Bhagandara* (Fistula-in-

ano) were enrolled and treated with Partial Fistulectomy with *Arkakshir* based *Ksharasutra* application. *Ksharasutra* was prepared as per API guidelines. *Sunhikshir* is replaced by *Arkakshir* and remaining ingredients as same as standard *Ksharsutra* preparation.

#### MATERIAL AND METHODS

15 patients of *Bhagandara* were enrolled from OPD of the dept. of Shalya Tantra, Pakwasa Samanway Rungalaya, Nagpur, and admitted in Shalya ward for surgical intervention.

#### Inclusion Criteria

1. The patients having inter-sphincteric, trans-sphincteric, supra-sphincteric fistula-in-ano.
2. The patients in age group between 18-60 years.

#### Exclusion Criteria

1. Patient having subcutaneous fistula-in-ano.
2. Patient having uncontrolled DM and HTN.
3. Secondary fistula due to Crohn's disease, Tuberculosis, Carcinoma of Rectum and anal canal, Ulcerative Colitis.

#### Procedure of preparation of *Ksharsutra*

##### *Ksharasutra* was prepared as per API guidelines

Linen thread no.20 was taken<sup>[14]</sup>. The Latex of *Arkakshir* collected in morning hours was coated with *Arkakshir* and kept in Cabinet for drying. This procedure was repeated for 11 times for 11 days. Then *Apamargkshar* coated after coating of *Arkakshir* for 7 times then 3 coatings of *Arkakshir* and *Haridra* were given. Every time after coating *Sutra* was dried in *Ksharsutra* cabinet. Cabinet was closed properly and hot air was blown in order to dry the thread. The order of 21 coatings was as follows<sup>[15]</sup>:

*Arkakshir* = 11

*Arkakshir* + *Apamargkshar* = 07

*Arkakshir* + *Haridra* = 03.

#### Procedure of Partial fistulectomy with *Ksharsutra*

**Pre-operative:** Informed written consent was taken. Proctoclysis enema was given at night for bowel

preparation. Parts preparation was done. Injection Tetanus Toxoid 0.5ml IM and Xylocaine Sensitivity test was done.

#### Operative procedure:

Under all aseptic precaution and under spinal anesthesia with patient in lithotomy position painting and draping was done. Suitable metallic probe inserted from external opening to internal opening of fistula-in-ano. Incision was taken over the fistula tract and partial fistulectomy was done upto anal sphincter muscle. After that in remaining fistulous tract, *Ksharsutra* was ligated [Figure 2]. After proper hemostasis wound was packed with betadine gauze and applied T-Bandage.

**Post-operative:** Since post-operative day 1, patients were advised for Sitz bath with *Triphala* decoction daily twice a day. Daily dressing with betadine was done. Proper Laxative *Gandharvaharitakivati* 2 HS was given to relieve constipation. One week later, old *Ksharsutra* was replaced with the new one with gradual tightening of *Arkakshir* based *Ksharsutra* by 'rail- road' technique.

#### Duration of Therapy

Length of tract varies from patient to patient; therefore, fixed duration of the therapy is unpredictable. *Ksharasutra* application was one stage of operation after which the follow up was taken till the healing of the wound and the fistula tract was cut through by *Ksharsutra*.

#### Follow up

Till cutting of fistulous tract and healing of partial fistulectomy wound regular follow up was taken on every 7<sup>th</sup> day. Then follow-up was taken after 6<sup>th</sup> month to check the recurrence.

#### Dietary Regimen

Highly fibrous diet with plenty of water was advised.

#### Criteria for Assessment

Subjective Criteria: 1. Pain 2. Incontinence

Objective Criteria: 1. Discharge 2. Unit cutting time

**Table 1: Assessment Criteria**

Sr. No.	Assessment Parameters	Assessment Criteria	Grade
1	Pain (as per VAS scale)	No pain	0
		Mild (1-3)	1
		Moderate (4-6)	2
		Severe (7-10)	3
2	Incontinence <sup>[16]</sup>	Continence of solid, liquid and flatus	0
		Continence of solid and usually liquid but not flatus	1
		Continence of solid but no control of liquid stool or flatus	2
		Continue fecal leakage	3
3	Discharge (Gauze size: 10X 10cm) <sup>[17]</sup>	No pus discharge	0
		Mild – appearance of discharge with using single	1

	gauze in 24 hours	
	Moderate- appearance of discharge using 2-3 gauze in 24hours	2
	Severe-bappearance of discharge using more than 3 gauze in 24 hours	3

Tract Length: Cutting time and healing of the tract takes place simultaneously. To assess the healing status of wound, U.C.T. is useful<sup>[19]</sup>.

Unit cutting time=  $\frac{\text{total number of days required to cut complete tract}}{\text{Initial length - Final length of tract}}$

Overall Effects of Therapy - Complete relief -- 75% and above  
 Moderate relief -- 50% to 74% improvement  
 Mild relief -- 25% to 49% improvement  
 No relief -- Below 24% improvement

### RESULT AND OBSERVATION:

Data was coded and entered in MS- Excel worksheet and analyzed by appropriate statistical software. The data was statistically analyzed by one-way repeated measure ANOVA test. After the analysis of data, it was observed that the incidence rate of Fistula-in-ano was more in 30-50 years of age group (70.66%), and also males were more prone to this disease (86.67%). In the present study, assessment was done on interval of every 7<sup>th</sup> day, to find out the relief in pain, discharge, incontinence, wound healing by partial fistulectomy with *Arkakshir* based *Ksharsutra* ligation. Subjective parameters were pain and incontinence. Pain was significantly relieved during the course of treatment as shown in Table2. In this study, before treatment score for pain was 3.46 and on 21<sup>st</sup> day it was 0.26. After the procedure, pain was significantly relieved on 7<sup>th</sup> day ( $p < 0.001$ ), on 14<sup>th</sup> day ( $p < 0.0007$ ) and on 21<sup>st</sup> day ( $P < 0.0005$ ) as shown in Table 2. In all patients pain occurred only when *Ksharsutra* was changed and continued for some hours. It was observed that incontinence was not present during and after the treatment in any patient. Discharge before treatment was 2.46 and on 21<sup>st</sup> day it was 0. It was completely relieved after the intervention of treatment, which was statistically highly significant (P value  $< 0.0004$ ).

**Table 2- Results of Parameters**

Sr. No.	Parameter	Time	Mean	Median	SD	Range	Z value	P value	Result
1	Pain	B. T.	3.46	4	0.64	2-4	-	-	-
		1 <sup>st</sup> day	2.8	3	1.42	1-5	1.499	0.1338	19.07%
		7 <sup>th</sup> day	1.93	2	1.03	1-4	3.279	0.0010	44.22%
		14 <sup>th</sup> day	1.26	1	1.09	0-4	3.400	0.0007	63.58%
		21 <sup>st</sup> day	0.26	0	0.45	0-1	3.460	0.0005	92.48%
2	Discharge	B.T.	2.46	3	0.83	1-3	-	-	-
		1 <sup>st</sup> day	1.20	1	0.94	0-3	2.938	0.0033	51.21%
		7 <sup>th</sup> day	0.73	0	0.88	0-2	3.359	0.0008	70.32%
		14 <sup>th</sup> day	0.46	0	0.64	0-2	3.419	0.0006	81.30%
		21 <sup>st</sup> day	0	0	0	0	3.531	0.0004	100%

The UCT is objective parameter assessed on every 7<sup>th</sup> day. Length of *Ksharsutra* was recorded (Table3) after every changing the *Ksharsutra*. Mean and standard deviation values of Unit Cutting Time before and after therapy recorded (Table 4). Complete cutting and healing of fistulous tract occurred within one month in 6 patients. The time required for complete healing in 6 patients was one and half month while in 3 patients it was 2 and half months. In some patients wound size was large, so time required was more for complete healing the wound.

**Table 3 Unit cutting time (UCT) of 15 patients:**

No. of patients	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
UCT	4.7	5	8.5	9.5	9	8.5	8.3	7	9.8	9.2	6	7	6	9	8.7

**Table 4 Mean and standard deviation values of Unit cutting Time before and after therapy**

Parameter	Mean	Median	SD	Range	Z value	P value	Result
UCT	7.68	8.5	3.50	1.7-10.7	3.411	0.0006	100%

As per protocol one follow-up was taken on 6<sup>th</sup> month after complete healing of wound which showed no recurrence of Fistula in ano. No adverse reaction found due to usage of *Arkakshir* based *Ksharsutra* in present study.



**Fig. 1: Local examination of Fistula-in-ano**



**Fig. 2 Partial fistulectomy with Ksharsutra**



**Fig. 3: After Cut down of Ksharsutra**



**Fig. 4: Follow up - Healing of wound**

## DISCUSSION

*Ksharsutra* is the potent treatment in *Bhagandara* routinely practiced by Ayurvedic surgeons. Standard *Apamarga Ksharasutra* is a proven to treat *Bhagandara* (Fistula-in-ano) and it has been standardized in Ayurvedic Pharmacopeia of India (API). Chakrapani has described *Ksharsutra* in management of *Bhagandara*<sup>[18]</sup> and Acharya Sushrut has recommended *Chhedankarma* in *Bhagandara* (*Chhedya Vyadhi*)<sup>[19,20]</sup>. In partial fistulectomy with *Ksharsutra* (KS), both *Chhedankarma* and *Ksharsutra* is used combined in order to reduced pain as well as duration of treatment<sup>[21]</sup>. In the treatment of intersphincteric, trans-sphincteric, supra-sphincteric fistulous tract use of only *Ksharsutra* procedure is time consuming and lengthy. Therefore, partial fistulectomy along with *Ksharasutra* was found very useful because it reduces duration of treatment. In this procedure, the fibrous part of fistula up to the sphincter muscle was excised and remaining tract was ligated by *Ksharsutra*. Partial fistulectomy wound with *Ksharsutra* helps to drain the pus from remaining tract so early healing of wound takes

place. In this study *Snuhikshir* in standard *Ksharsutra* was replaced by *Arkakshir* for coating as it is easily available especially in Nagpur region. It was observed while preparing *Ksharsutra*, *Arkakshir* has strong binding property so *Ksharsutra* does not shed off *Apamarga Kshar* and *Haridra* (*Curcuma longa*). The properties of *Arkakshira* (latex) are *Ushna*, *Snigdha*, *Rasa* is *Tikta*, *Lavan*, *Vipaka* *Katu*, *Virya* *Ushna*, and *Karma* is *Kaphavata Shamak*<sup>[22]</sup>. Various *Nighantu* has described properties of *Arka* (*Calotropis procera* Linn) as *Vranaghna* i.e. wound healing property, *Lekhan* (Debridement), *Kandughna* (antipruritic), *Krimihar* (antimicrobial), *Shophahar* (Anti-inflammatory) properties<sup>[23,24]</sup>. As per recent researches some properties showed resemblance with above said properties. The methanolic extract and hydroxyl groups in the phenolic compounds of *Calotropis procera* exhibit the high radical scavenging property and it has potential source of antioxidants<sup>[25]</sup>. The ethanolic extract of the *Calotropis procera* showed an anti-inflammatory activity in several animal models<sup>[26]</sup>. The aqueous

extract of *Calotropis procera* increases the collagen, DNA and protein synthesis and epithelization which improve the healing process of wound<sup>[27]</sup>. An aqueous and ethanolic extract of *Calotropis procera* possess antimicrobial activity<sup>[28]</sup>. This reduces the chances of infection in fistulectomy wound. *Arkakshir* acts as anti-slough agents resulting curettage of the tract and removes slough or tissue debris (*Lekhana Karma*)<sup>[29]</sup>. *Ksharsutra* made by *Arkakshir* supports the faster cutting as well as healing of the remaining tract because of above said properties. The other drugs used in *Ksharsutra* like *Apamarga* and *Haridra* also possesses following properties. *Apamarg Kshara* (*Achyranthus aspera* Linn.) has shown anti-inflammatory, anti-microbial, analgesic and antipyretic activity<sup>[30]</sup>. Alkaline nature of *Kshara* incinerates dead tissue and control local infection which provide cutting as well as healing. *Haridra* (*Curcuma longa* Linn.) has *Vranaropan* (Wound healing), *Vranashodhak* (Cleaning of wound), *Lekhan* (Scraping) properties which showed anti-septic, anti-toxic and healing activity. Alcoholic extract and sodium curcumin have antibacterial activity and petroleum ether extract has anti-inflammatory activity<sup>[31]</sup>. *Haridra* diminishes reaction of caustics and provide the healthy environment for wound healing<sup>[32]</sup>. *Ksharsutra* has action of excision (*Chhedan*), scraping (*Lekhan*), draining (*Vistravan*), debridement (*Shodhan*), Healing (*Ropan*), bactericidal and bacteriostatic. Due to the anti-microbial action and as seton it allows the proper drainage of pus which leads to proper healing and on other hand cutting effect of the thread incises the tract i.e., it has action of healing and cutting both at same time<sup>[33,34]</sup>. The cutting of fistula tract is also assumed by mechanical pressure of tight *Ksharsutra*. *Gandharvaharitakivati* evacuates the faces and regularizes the bowel movement which also helps to reduce pain at anal region. The conventional fistulectomy has high recurrence rate and chance of loss the sphincter tone. In partial fistulectomy with *Arkakshir* based *Ksharsutra* has reduced the duration of therapy and sphincter saving method for fistula-in-ano.

## CONCLUSION

This study demonstrates that, the partial fistulectomy along with *Arkakshir* based *Ksharsutra* in fistula-in-ano plays vital role in reducing pain, discharge and the most important duration of treatment. Hence, Partial fistulectomy with *Arkakshir* based *Ksharsutra* application is said to be best procedure which promotes early wound healing with sphincter saving method and least recurrence rate.

No adverse reaction found due to usage of *Arkakshira* based *Ksharsutra* in present study.

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