



## Research Article

### EFFICACY OF YAVA KSHARA SUTRA TRANSLIGATION IN THE MANAGEMENT OF ARSHAS (3<sup>RD</sup> & 4<sup>TH</sup> DEGREE HAEMORRHOIDS) - A RANDOMISED CONTROLLED CLINICAL STUDY

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#### ABSTRACT

*Arsha* is named as one of the most common *Guda Vyadhis*. According to *Acharya Vagbhata*, *Arshas* are defined as *Mamsankura*. which obstruct *Guda Marga* and thus affect the person like an enemy. In contemporary terminology, *Arshas* is comparable to piles or hemorrhoids, which represent pedunculated growths due to the engorgement of radicles of superior, middle, and inferior rectal veins. As per the *Sushruta Samhita* text, the management of *Arshas* involves *Bheshaja Chikitsa*, *Kshara Karma*, *Agnikarma*, and *Shastra Karma*. *Chikitsa* of *Arshas* by the use of *Kshara* is minimally invasive as well as cost effective and is a potent alternative for surgical procedures. *Apamarga* (*Achyranthes aspera*) has shown its efficacy in the management of anorectal disorders and has been used widely for *Kshara* preparation. The only limitation to its usage is its seasonal variation in growth; thus, there is a need of alternative *Kshara dravya*. *Yava* (*Hordeum vulgare* Linn.) commonly known for its *Lekhana* action described by *Acharya Sharangadhara*, is employed for *Kshara Sutra* preparation in this study. **Objectives:** To evaluate *Yava Kshara Sutra* as an effective, easily available, and economical alternative to *Apamarga Kshara Sutra* in the management of *Arshas* (3<sup>rd</sup> & 4<sup>th</sup> Degree Haemorrhoids). **Materials & Methods:** A minimum of 40 patients diagnosed with symptoms of *Arshas* attending O.P.D & I.P.D of *Shalya Tantra* Department, S.J.G. Ayurveda Medical College and Hospital, Koppal, Karnataka, selected for the study. **Outcomes:** All 40 patients diagnosed with *Arshas* (3<sup>rd</sup> & 4<sup>th</sup> degree Hemorrhoids) were randomly divided in Group A and Group B and subjected to *Kshara sutra* translavigation procedure of management. **Conclusion:** This case study demonstrates the therapeutic efficacy of *Yava kshara sutra* and comparison with standard *Apamarga kshara sutra* translavigation in the management of *Arshas* (3<sup>rd</sup> & 4<sup>th</sup> degree Hemorrhoids).

#### INTRODUCTION

Hemorrhoids are the anatomical anal cushions present in the anal canal also known as the Corpus Cavernosum Recti. These cushions prolapse internally due to various etiological factors and pathologically present as pedicle like lesions formed by dilated radicles of the superior, middle and inferior rectal veins in the subepithelial region of the anal canal.

Internal Haemorrhoids occur within the anal canal and External Hemorrhoids are situated outside the anal orifice. [1]

Haemorrhoids are correlated to *Arshas* in the contemporary science. According to *Acharya Vagbhata*, *Arshas* are the *Mamsankura* (engorged veins) protruding out and obstructing the *Guda marga* (anal canal) which tortures the person like an enemy [2].

This disease affects males and females with equal predisposition and increased incidence have been observed in the population worldwide. At least 50% of the people over the age of 50 years have some degree of symptoms related to haemorrhoids.[3] With increasing trend of westernization of diet the disease shows advanced prevalence rate (4.4%). The elimination of fibre rich food from the diet shows a

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predilection towards development of piles. Haemorrhoids may occur at any age but mostly seen in the age between 30 to 65 years.<sup>[4]</sup>

According to prolapse haemorrhoids are classified into 4 degrees wherein 3<sup>rd</sup> degree haemorrhoids come out during defecation and do not return by themselves but need to be placed back manually and 4<sup>th</sup> degree haemorrhoids are permanently prolapsed and are characterized by a great deal of discomfort and heaviness in the rectum. Bleeding, prolapse, pain, discharge and anaemia are the common clinical features.<sup>[5]</sup>

Modern therapeutic management for 3<sup>rd</sup> & 4<sup>th</sup> degree Hemorrhoids includes Lord's dilatation, Cryosurgery, Infra-red coagulation, laser therapy, DGHAL (Doppler Guided Hemorrhoidal Artery Ligation), open-Haemorrhoidectomy, closed-haemorrhoidectomy, and Stapled Haemorrhoidopexy<sup>[6]</sup> which have their own disadvantages.

Disadvantages such as starting of profuse watery discharge within 3 hours of Cryosurgery which lasts upto 3 to 4 weeks, significant incidences of incontinence in elderly after Anal dilatation, association of complications such as stricture of anal canal following closed hemorrhoidectomy.<sup>[7]</sup>

Acharya Sushruta has mentioned six types of Arshas they are Vataja, Pittaja, Kaphaja, Raktaja, Sannipataja and Sahaja. Arshas are associated with clinical features such as Mamsankura in Guda, Shula, Vedana, Rakta atisrava, Daha, Guda kandu, Shopha<sup>[8]</sup>. Treatment modality for the management of Arshas<sup>[9]</sup> as advised in Sushruta Samhita are Bheshaj Chikitsa, Kshara Karma, Agnikarma and Shastra Karma. Among these Kshara karma in Arshachikitsa has been advised in Arshas which are Mrudu (soft), Prasruta (broad), Avagadha (deep seated) and Uchrita (bulged up).<sup>[10]</sup>

Apamarga (*Achyranthes aspera*) has shown its efficacy in the management of anorectal disorders and has been used widely for Kshara preparation. The only limitation to its usage is its seasonal variation in

growth; thus, there is a need of alternative Kshara dravya. Yava (*Hordeum Vulgare* Linn.) is one of the Kshara Dravya as mentioned by Acharya Sharangdhara<sup>[11]</sup> which is well known for its Lekhana property in the Chikitsa of Arshas, has been selected as the choice of drug in this study for making of Kshara Sutra.

The efficacy of Yava Kshara Sutra in the management of Arshas (3<sup>rd</sup> & 4<sup>th</sup> degree haemorrhoids) has been analyzed statistically in this study.

## MATERIALS AND METHODS

### Trial Design

The trial type and allocation ratio for this study are randomized parallel group trial and 1:1, respectively. This study is approved by ethical clearance obtained from Shree Jagadguru Gavisiddheshwara Ayurvedic Medical College (Ref. No/2023/448/10). Informed consent was sought before recruiting individuals into this study. The trial was registered with the central trial registry of India (CTRI/2025/06/089255).

### Eligibility Criteria for Participants

#### Inclusion Criteria

Patient of either gender aged between 20-65 years diagnosed with Arshas (3<sup>rd</sup> & 4<sup>th</sup> degree Hemorrhoids).

#### Exclusion Criteria

Hemorrhoids associated with fistula in ano, fissure in ano, Crohn's disease, ulcerative colitis, immune compromised patients, systemic conditions such as diabetic, hypertensives, TB, patients testing positive for Human Immune Deficiency Virus, Hepatitis B, patients with anemia with Hemoglobin less than 8g, with 1<sup>st</sup> and 2<sup>nd</sup> degree hemorrhoids.

#### Collection of Data

The cases of 3<sup>rd</sup> and 4<sup>th</sup> degree internal Haemorrhoids from the OPD of Shree Jagadguru Gavisiddheshwara Ayurvedic Medical College meeting the inclusion and exclusion criteria were assigned in groups as depicted in Table-1.

**Table 1: Details of Intervention**

S.No	Details	Trial Group A- 20 Patients	Control Group B- 20 Patients
1.	Intervention	Yava Kshara Sutra Transligation	Apamarga Kshara Sutra Transligation

### Source of Drug

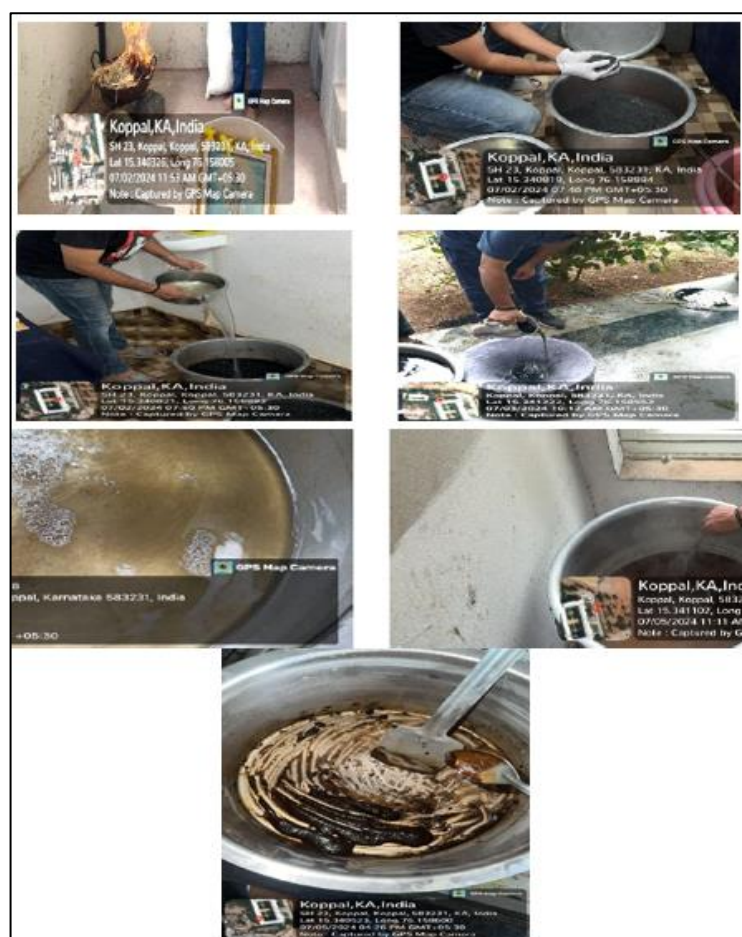
**Raw drugs** - Apamarga and Yava as shown in Table-2 were identified and authenticated by Department of Dravyaguna were collected from the source of availability and the Kshara was prepared according to the classical references at our college pharmacy and same was used for the preparation of Kshara Sutra.

**Table 2: Drugs used in the preparation of *Kshara sutra* & pharmacological Properties <sup>[12]</sup>**

S.No.	Ingredients	Botanical Name	Part Used	Karma
1.	Yava	<i>Hordeum vulgare</i>	Panchanga	Kapha hara, Ruksha, Shita, Guru, Lekhana, Susukshma, Sheeghrapaki, Agnideepaka
2	Apamarga	<i>Achyranthes Aspera</i>	Panchanga	Kaphaghna, Laghu, Teekshna, Ruksha, Usna

### Preparation of *Kshara*

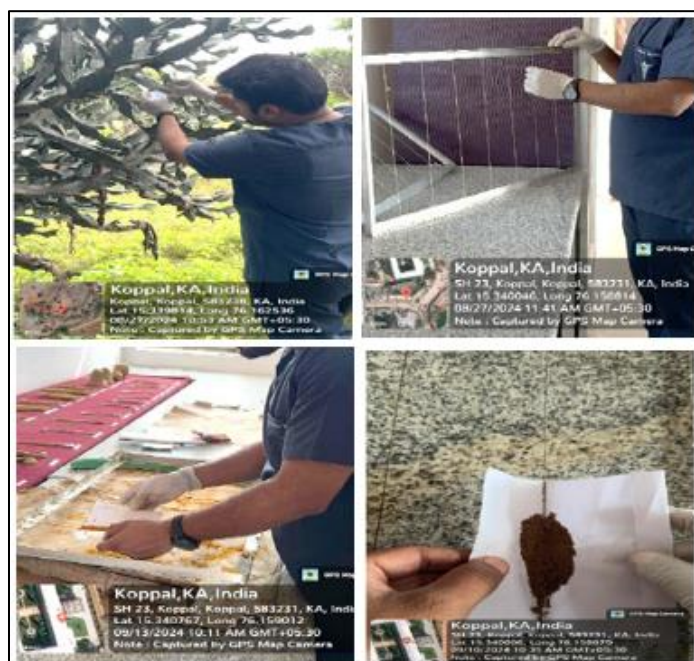
As shown in Figure-1 *Panchangas* of the *Yava* (*Hordeum vulgare*) /*Apamarga* (*Achyranthes Aspera*) were collected in moist form and cut into small pieces and dried in shadow. The *Panchangas* of the dried *Yava*/*Apamarga* were heaped on a clean stone slab and ignited with *Tila nala* and was allowed to burn completely into ash, then ash was allowed to cool (*Swanga sheeta*). Then ash was collected and soaked in 6 times (as per volume) of the water and stirred well, then kept undisturbed overnight. Next day morning the supernatant liquid portion was decanted into another container and the sedimented portion was discarded. Then this was filtered for 21 times and residue was discarded. Then filtrate is heated on low flame and stirred continuously to get homogenous *Kshara* paste. Later, this *Kshara* paste is shifted to small wok and heated on low flame until it converts into powder form.

**Figure 1: Preparation of *Kshara***

### Preparation of *Kshara sutra*

As shown in figure-2 Barbour thread no. 20 was taken and *Snuhi Ksheera* was applied 11 times, after complete drying of each previous coating. The same was done using the *Snuhi Ksheera* with *Yava*/*Apamarga mridu* *Kshara* for 7 times and last 3 coatings will be done by using *Snuhi Ksheera* with *Haridra Churna*.

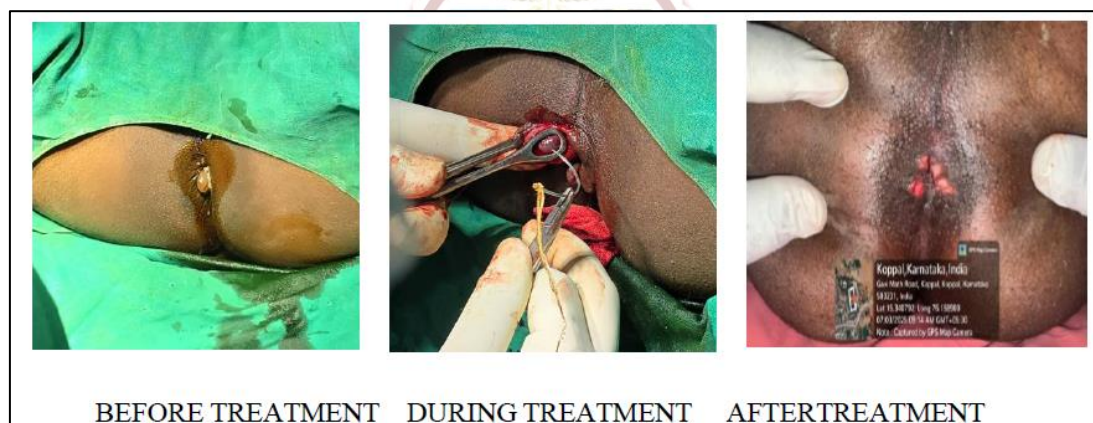




**Figure 2: Kshara Sutra Preparation**

## Methodology

Patients fulfilling the inclusion criteria were selected and were posted for the procedure after appropriate clinical examination and investigations. Proper informed consent was taken and after pre-operative preparation of patient, procedure of *Kshara sutra* transligation at the base of hemorrhoids was performed as shown in figure.3 followed by post operative care and assessment.



**Figure 3: Kshara Sutra Transligation**

## Outcome measures

### Primary Outcome

Observation of the effects of *Kshara sutra* transligation were observed on the pile mass and anal mucosal surface. These observations were recorded clinically while assessing any other adverse drug reaction.

### Sample size and Randomization

40 samples were taken for the study, 20 in each group was randomized in simple random technique based on order of presentation in our clinical department. Alternation of patients was done randomly under the supervision of guide. The estimated duration of trial was for 1 year.

## Statistical Measures

Fridman's test, Bonferroni test, Mann whitney U test was used to compare group A and group B for primary outcome. The parameters included in statistical analysis were pain, bleeding per rectum, mucoid discharge, pruritus ani and fall of mass.

### Assessment criteria

#### Subjective parameters

##### 1. Bleeding

Grade 0 – No bleeding

Grade 1 – Mild bleeding; occasional episodes (during defecation)

Grade 2 - Moderate bleeding; frequent episodes (during defecation)

Grade 3 - Severe bleeding; persistent bleeding even without defecation with fall in Hb level (<10 gm/dL); requiring haematinics.

Grade 4 - very severe bleeding; bleeding in the form of jets and splashes with severe fall in Hb level (<8 gm/dL); requiring blood transfusion.

## 2. Pain

Grade 0 - No pain

Grade 1 - Mild pain (Pt. able to tolerate, subsides with rest)

Grade 2 - Moderate pain (Pain subsides with the use of analgesics)

Grade 3 - Severe pain (Pain doesn't subsides even after taking analgesics)

## 3. Mucoïd Discharge

Grade 0 - No noticeable mucus discharge

Grade 1 - Occasional clear mucus on wiping/toilet paper; no pad/undergarment change needed

Grade 2 - Moderate (visible underwear staining; sometimes needs to change undergarment)

Grade 3 - Severe (continuous discharge; requires pad; perianal skin irritation; interference with activities/sleep)

## RESULTS

## 4. Pruritis Ani

Grade 0 - Absent

Grade 1 - Mild (Occasional, no sleep disturbance)

Grade 2 - Moderate (daily, may disturb activities)

Grade 3 - Severe (constant, sleep disturbed, excoriation present)

## Objective parameters

1. **Falling of pile mass along with *Kshara sutra* duration (in terms of days)**

## Demographic detail and base line data

Out of 40 patients enrolled in the study, 24 were males and 16 females, with maximum patients between 39-47 years age in both the groups. While majority 32 patients had *Mandagni*, it was also observed that maximum of 25 patients were accustomed to mixed diet.

## Outcome and Estimation

The results evaluated using subjective and objective variables were classified under four groups as poor response, mild response, moderate response and good response. Poor was with less than 25% of reduction, more than 25-49% was with mild reduction, moderate response was with 50-75% reduction and good response was with more than 75% reduction in subjective and objective parameters.

**Table 3: Mean scores of subjective, objective parameters between groups**

Parameters	Group A					Group B				
	BT-1 <sup>st</sup> day	AT-3 <sup>rd</sup> day	FU-5 <sup>th</sup> day	FU-7 <sup>th</sup> day	%	BT -1 <sup>st</sup> day	AT 3 <sup>rd</sup> day	FU-5 <sup>th</sup> day	FU-7 <sup>th</sup> day	%
Bleeding	2.50	1.15	0.70	0.10	96%	2.40	0.90	0.45	00	100%
Pain	2.10	1.20	0.75	0.25	88%	2.10	1.00	0.50	0.05	97.6%
Mucoïd discharge	1.50	0.45	0.20	0.05	96.7%	1.55	0.35	0.10	0.00	100%
Pruritus ani	1.20	0.60	0.45	0.20	83.3%	1.25	0.45	0.30	0.10	92%

## Subjective Parameters

### Effect on Bleeding

**Table 4: Comparisons Between Group A (Trial) with Group B (Control) in Bleeding**

Observations Recorded on	Descriptives			Mean Diff. & (% Diff. from pre phase)	Mann-Whitney U				
	Group	Mean Score $\pm$ SD	Median Value		U Statistic	Effect Size	Z	P	Remarks
AF1 -3 <sup>rd</sup> Day	A (n=20)	1.15 $\pm$ 0.59	1.0	0.25 (8.50%)	158	0.22	1.37	0.17 (>0.05)	NS
	B (n=20)	0.90 $\pm$ 0.55	1.0						
AF2 -5 <sup>th</sup> Day	A (n=20)	0.70 $\pm$ 0.47	1.0	0.25 (9.25%)	150	0.25	1.58	0.114 (>0.05)	NS
	B (n=20)	0.45 $\pm$ 0.51	0.0						
AF3 -7 <sup>th</sup> Day	A (n=20)	0.10 $\pm$ 0.31	0.0	0.10 (4.00%)	180	0.23	1.43	0.152 (>0.05)	NS
	B (n=20)	0.00 $\pm$ 0.00	0.0						

Between the groups findings concerning the bleeding variable suggests that overall Group B (Control) is almost same as Group A (Trial) by mere difference of 4.00% and mean difference was 0.1 at the last AF3 -7<sup>th</sup> Day phase, with a small effect size of  $r = 0.23$  result. Then the Mann-Whitney U Test analysis suggests that there is no significant difference between Groups A and B in terms of their respective reductions in bleeding for all phases like AF1 -3<sup>rd</sup> Day, AF2 -5<sup>th</sup> Day and AF3 -7<sup>th</sup> Day. The p-values above the conventional threshold of 0.05 indicate a lack of statistical significance, implying that the observed variations in Bleeding reduction between the two groups are likely due to chance rather than meaningful differences.

#### Effect on Pain

**Table 5: Comparisons Between Group A (Trial) with Group B (Control) in Pain**

Observations Recorded on	Descriptives			Mean Diff. & (% Diff. from pre phase)	Mann-Whitney U				
	Group	Mean Score $\pm$ SD	Median Value		U Statistic	Effect Size	Z	P	Remarks
AF1 -3 <sup>rd</sup> Day	A (n=20)	1.20 $\pm$ 0.52	1.0	0.20 (9.52%)	164	0.20	1.29	0.198 (>0.05)	NS
	B (n=20)	1.00 $\pm$ 0.46	1.0						
AF2 -5 <sup>th</sup> Day	A (n=20)	0.75 $\pm$ 0.44	1.0	0.25 (11.90%)	150	0.25	1.61	0.107 (>0.05)	NS
	B (n=20)	0.50 $\pm$ 0.51	0.5						
AF3 -7 <sup>th</sup> Day	A (n=20)	0.25 $\pm$ 0.44	0.0	0.20 (9.52%)	160	0.28	1.75	0.08 (>0.05)	NS
	B (n=20)	0.05 $\pm$ 0.22	0.0						

Between the groups findings concerning the pain variable suggests that overall Group B (Control) is almost same as Group A (Trial) by mere difference of 9.52% and mean difference was 0.2 at the last AF3 -7<sup>th</sup> day phase, with a small effect size of  $r = 0.28$  result. Then the Mann-Whitney U Test analysis suggests that there is no significant difference between Groups A and B in terms of their respective reductions in pain for all phases like AF1 -3<sup>rd</sup> day, AF2 -5<sup>th</sup> day and AF3 -7<sup>th</sup> day. The p-values above the conventional threshold of 0.05 indicate a lack of statistical significance, implying that the observed variations in pain reduction between the two groups are likely due to chance rather than meaningful differences.

#### Effect on Mucous Discharge

**Table 6: Comparisons Between Group A (Trial) with Group B (Control) in Mucous Discharge**

Observations Recorded on	Descriptives			Mean Diff. & (% Diff. from pre phase)	Mann-Whitney U				
	Group	Mean Score $\pm$ SD	Median Value		U Statistic	Effect Size	Z	P	Remarks
AF1 -3 <sup>rd</sup> Day	A (n=20)	0.45 $\pm$ 0.61	0.0	0.10 (7.42%)	187	0.07	0.43	0.665 (>0.05)	NS
	B (n=20)	0.35 $\pm$ 0.49	0.0						
AF2 -5 <sup>th</sup> Day	A (n=20)	0.20 $\pm$ 0.41	0.0	0.10 (6.88%)	180	0.14	0.87	0.382 (>0.05)	NS
	B (n=20)	0.10 $\pm$ 0.31	0.0						
AF3 -7 <sup>th</sup> Day	A (n=20)	0.05 $\pm$ 0.22	0.0	0.05 (3.33%)	190	0.16	1.00	0.317 (>0.05)	NS
	B (n=20)	0.00 $\pm$ 0.00	0.0						

Between the groups findings concerning the mucous discharge variable suggests that overall Group B (Control) is almost same as Group A (Trial) by mere difference of 3.33% and mean difference was 0.05 at the last AF3 -7<sup>th</sup> day phase, with a small effect size of  $r = 0.16$  result. Then the Mann-Whitney U Test analysis suggests that there is no significant difference between Groups A and B in terms of their respective reductions in mucous discharge for all phases like AF1 -3<sup>rd</sup> day, AF2 -5<sup>th</sup> day and AF3 -7<sup>th</sup> day. The p-values above the conventional threshold of 0.05 indicate a lack of statistical significance, implying that the observed variations in mucous discharge reduction between the two groups are likely due to chance rather than meaningful differences.

**Effect on Pruritis Ani****Table 7: Comparisons Between group A (Trial) with group B (Control) in pruritus ani**

Observations Recorded on	Descriptives			Mean Diff. & (% Diff. from pre phase)	Mann-Whitney U				
	Group	Mean Score $\pm$ SD	Median Value		U Statistic	Effect Size	Z	P	Remarks
AF1 -3rd Day	A (n=20)	0.60 $\pm$ 0.50	1.0	0.15 (14.00%)	170	0.15	0.94	0.348 (>0.05)	NS
	B (n=20)	0.45 $\pm$ 0.51	0.0						
AF2 -5th Day	A (n=20)	0.45 $\pm$ 0.51	0.0	0.15 (13.50%)	170	0.15	0.97	0.333 (>0.05)	NS
	B (n=20)	0.30 $\pm$ 0.47	0.0						
AF3 -7th Day	A (n=20)	0.20 $\pm$ 0.41	0.0	0.10 (8.67%)	180	0.14	0.87	0.382 (>0.05)	NS
	B (n=20)	0.10 $\pm$ 0.31	0.0						

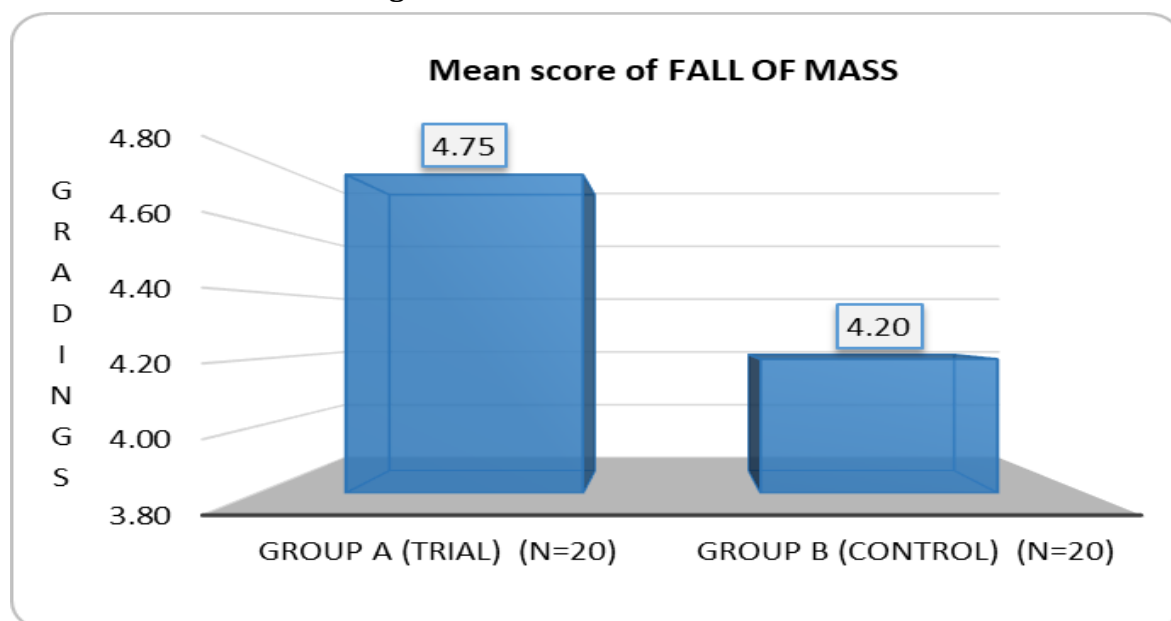
Between the groups findings concerning the pruritus ani variable suggests that overall Group B (Control) is almost same as Group A (Trial) by mere difference of 8.67% and mean difference was 0.1 at the last AF3 -7<sup>th</sup> day phase, with a small effect size of  $r=0.14$  result. Then the Mann-Whitney U Test analysis suggests that there is no significant difference between Groups A and B in terms of their respective reductions in pruritus ani for all phases like AF1 -3<sup>rd</sup> day, AF2 -5<sup>th</sup> day and AF3 -7<sup>th</sup> day. The p-values above the conventional threshold of 0.05 indicate a lack of statistical significance, implying that the observed variations in pruritus ani reduction between the two groups are likely due to chance rather than meaningful differences.

**Objective Parameter****Assessment of Fall of Mass****Table 8: Comparisons Between Group A (Trial) with Group B (Control) in Fall of Mass**

Groups	Mean Score $\pm$ SD	Median Value	Mean Diff.	Grade wise frequency with percentage distribution				
Group A (Trial) (n=20)	4.75 $\pm$ 0.97	5.0	0.55	3 Grade (n=2 (10%)); 4 Grade (n=6 (30%)); 5 Grade (n=7 (35%)); 6 Grade (n=5 (25%)); 0				
Group B (Control) (n=20)	4.20 $\pm$ 1.11	4.0		3 Grade (n=7 (35%)); 4 Grade (n=5 (25%)); 5 Grade (n=5 (25%)); 6 Grade (n=3 (15%)); 0				
Mann-Whitney U test								
Groups Comparison			Effect % Diff.	U Statistic	Effect size	Z Test Statistic	P	Remarks
Group B (Control) effective > Group A (Trial)			11.6%	142	0.26	1.62	0.121 (>0.05)	NS

Between the groups findings as shown in Figure-2 suggests that overall Group B (Control) is slightly better than Group A (Trial) by 11.58%. But the Mann-Whitney U Test analysis suggests that there is no significant difference between Group A (Trial) with Group B (Control) in terms of their respective reductions in fall of mass. The p-values above the conventional threshold of 0.05 indicate a lack of statistical significance, implying that the observed variations in fall of mass reduction between the two groups are likely due to chance rather than meaningful differences.



**Figure 2: Mean score of Fall of mass****Overall Response****Table 9: Overall response**

Overall Response AF 3 <sup>rd</sup> -7 <sup>th</sup> Day							
Response Rates	Response	Group A (Trial)		Group B (Control)		Mann-Whitney U Test	
		Frequency	%	Frequency	%	Test Statistics	Value
(0%-25%)	Poor response	0	0%	0	0%	<i>U</i>	170
(25%-50%)	Mild response	0	0%	0	0%	Effect Size	0.28
(50%-75%)	Moderate response	1	5%	0	0%	<i>Z</i>	1.78
(75%-99%)	Marked response	7	35%	3	15%	<i>P</i>	>0.05 (0.075)
(99%-100%)	Complete response	12	60%	17	85%	Remarks	NS
Total		20	100%	20	100%	NS -non-significant	

The overall response FU -7<sup>th</sup> day distribution of responses shows that both groups had similar outcomes, with a significant proportion of subjects in both the marked and complete response categories in both the groups Group A (Trial) and Group B (Control). Even though Group B (Control) have slightly more subjects in the complete response category and slightly fewer in the marked response category compared to Group A (Trial). Additionally, Group A (Trial) have groups have 1 subject in moderate response category.

The Mann-Whitney U Test for independent groups, is used to assess the overall differences between the two groups Group A (Trial) and Group B (Control) at the completion FU -7<sup>th</sup> day phase by considering combined observations of all the subjective and objective parameters between the groups Group A (Trial) and Group B (Control). The findings; test statistic (*U*) is calculated as 170, and the corresponding *Z*-value is 1.78. The *p*-value for this comparison is reported as 0.075, denoting a statistically No-Significant differences between the groups, with a small effect size of *r*= 0.28 result. Hence both the drugs are equally effective with minimal differences in the mean scores observed as shown in Table-4.

**Table 10: Comparing Mean Scores of Groups**

Parameters	Group A (Mean Score)	Group B (Mean Score)	P Value
Bleeding	0.10	0.00	<0.05
Pain	0.25	0.05	<0.05
Mucoid discharge	0.05	0.00	<0.05
Pruritic ani	0.20	0.10	<0.05
Fall of Mass	4.75	4.20	<0.05



## DISCUSSION

The traditional techniques for preparing *Kshara sutra* are detailed by Acharya Chakrapani in his work Chakradutta<sup>[13]</sup>. *Kṣhara Sūtra* transliteration combines mechanical ligation with chemical cauterization. Mechanistically, the procedure causes gradual vascular compression of the haemorrhoidal pedicle, leading to localized ischemia followed by necrosis of the pile mass <sup>[14]</sup>; at the same time, it utilizes the *Lekhana* and *Ruksha* characteristics of *Yava Kshara* to reduce oedema while the *Kapha-hara* <sup>[15]</sup> effect alleviates mucous discharge. The *Śodhana* and *Utkleśana* properties inhibit infection and allow gradual sloughing of the hemorrhoidal stump. The *Śita* and *Guru gunas* reduce excessive inflammation. *Agnideepaka* and *Śighrapaki* also help in subsiding inflammation, while *Ropana* effects of *Kshara* <sup>[16]</sup> promote healthy granulation and fibrous adhesion of the mucosa. Collectively, these measures diminish bleeding and discharge, while also fixating the prolapsed mucosa to the anal musculature which helps to decrease the risk of recurrence.

The physio and phytochemical analysis as shown in Figure-3 indicates a dual mode of action. The alkaline and mineral-dense matrix causes debridement in the form of protein denaturation and lipid saponification. This results in tissue necrosis followed by debridement of the necrotic material which aids in achieving adequate haemostasis. Semi-polar phytochemicals such as flavonoids, terpenoids, saponins, alkaloids exhibit antioxidant, anti-inflammatory effects thereby facilitating reduction in microbial load. The fibroblast, keratinocyte, and collagen activity causes tissue contraction leading to fixation of the mucosa and localised tissue repair.

## CONCLUSION

Taking account of the effects of the trial drug, it can be concluded that the intrinsic properties of *Yava Kṣhara* such as *Utkleśhana*, *Lekhana*, *Śodhana*, and *Ropana* offer a rational pharmacological basis for its use. Rich in alkaline bioactive constituents, exerts controlled caustic action on pathological tissue, facilitating gradual sloughing of haemorrhoidal mass while simultaneously promoting wound healing. The comparative evaluation of both groups showed improved therapeutic outcomes among participants and the results were statistically comparable. The observed results are derived from procured data analysis and needs further exploration.

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