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A randomised controlled clinical study to evaluate the role of *Nirvapana Upakrama* with *Durva* ointment in the management of *Pittaja Dushta Vrana* with special reference to fissure-in-ano

Parvathy Gopan¹, Padma², KM Sweta³, Dhyan Surendranath⁴

¹Post Graduate Scholar, Department of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru, Karnataka, India.

²Associate Professor, Department of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru, Karnataka, India.

³HOD & Professor, Department of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru, Karnataka, India.

⁴Associate Professor, Department of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru, Karnataka, India.

ABSTRACT

Introduction: Fissure-in-ano is an ulcer in the longitudinal axis of lower anal canal. It is having prevalence of about 17.91%. By seeing the signs and symptoms we can consider it as one among the six varieties of *Dushta Vrana* i.e., *Pittaja Dustavrana*. Due to busy life schedules people don't prefer hospitalization and other operative procedures. So, there is a need to find out a new and simpler medicament which enables easy and better storage, preservation and mode of application. Here an attempt was made to study the effect of *Nirvapana Upakrama* in the management of fissure in ano is taken. This *Upakrama* is used for the treatment of *Vrana* accompanied with *Daha*, *Paka*, *Jwara* and having *Pitta Kopa* and *Raktena Abhibhuta*. Since fissure is having the similar symptoms this treatment can be adopted for the management of the same. **Methodology:** A randomized controlled clinical study was conducted over 30 subjects in two groups. Fifteen subjects were advised to apply Diltiazem gel and 15 subjects were advised to apply *Durva* ointment twice daily for a period of 14 days. **Results:** Rapid reduction in pain, burning sensation and length of ulcer was observed in the subjects who were given *Durva* ointment. **Discussion:** *Durva* ointment having *Madura Rasa*, *Snigdha Guna* and *Sheeta Virya* does *Vatapitta Shamana* and pacifies vitiated *Rakta*. *Kashaya rasa* of *Durva* does *Vrana Ropana* and *Rakta Sthambana* which amplifies in ulcer healing and relaxation of the sphincter.

Key words: Fissure-in-ano, *Pittaja Dushta Vrana*, *Durva Ghrita*

INTRODUCTION

Human being suffered various health disorders since ages. Anorectal disorders are one among such ailment attributed to change in lifestyle and food habits. In the present era about 30-40% of the population are suffering from anorectal disorders.^[1] Among them

fissure-in-ano is one of the commonest having prevalence about 17.91%.^[2] It is an ulcer in the longitudinal axis of lower anal canal, commonly occurs in midline posteriorly. It is more common in females.^[3] In men 95% of anal fissure are posterior where as in females it constitutes 80%. "*Parikarthika*"- which literally means "*Karthanavat Shoola*" has been explained as a symptom in *Virechana Vyapat* having *Vata Pitta* predominance along with other symptoms like *Gudadaha* and *Anilasanga*. This has close similarity with "fissure-in-ano", which has symptoms like pain, constipation, bleeding, and itching and canoe type ulcer formation.^[3] When we analyse these signs and symptoms, we can find similarity with *Pittaja Dustavrana* i.e., *Daha*, *Paka* etc.^[4]

Contemporary science offers both conservative as well as surgical management for fissure. Conservative treatments include stretching of anal sphincter, lord's anal dilatation, use of laxatives, topical nitro glyceride

Address for correspondence:

Dr. Parvathy Gopan

Post Graduate Scholar, Department of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research Hospital, Bengaluru, Karnataka, India.

E-mail: sreyasparu95@gmail.com

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application, and diltiazem 2% application. Surgical management like dorsal fissurectomy, lateral anal sphincterotomy, anal advancement flap etc. are also practiced. The major drawback seen in those are - prolonged convalescent period, continuous mucous discharge, hematoma formation, recurrent ulcer formation, risk of damage to the underlying sphincter.^[3] When we look for a solution in *Ayurvedic* perspective, *Shashti Upakrama* mentioned in *Susrutha Chikitsa* comes to lime light. Here 60 modalities starting from *Apatharpana* to *Rakshavidhana Vidhi* are explained in details for the management of *Vrana*. Each of this *Upakrama* has an important role in management of various stages of *Vrana*.^[6] *Nirvapana* is one among *Shashti Upakrama* explained for the treatment of *Vrana* accompanied with *Daha*, *Paka*, *Jwara* and having *Pitta Kopa* and *Raktena Abhibhuta*. Considering the similarity with fissure-in-ano in terms of symptoms, here an attempt to study the effect of *Nirvapana Upakrama* in the management of fissure was made. Here *Acharya* mentioned to use *Seetha Guna Dravyas* macerated in *Ksheera* added with *Ghee* as a *Lepa*^[7] over the *Vrana*. Commenting on the *Sheeta Guna Dravyas* in the context, *Acharya Dalhana* mentioned about *Yoga Durvadi*, which includes *Durva*, *Nalamoola*, *Madhuka*, *Chandana* etc.

As *Durva* is mentioned first and having properties like *Kashaya Rasa*, *Seetha Virya*, *Kapha-Pittahara*, *Raktapitta Samaka* and *Daha Samana*, it was taken here.^[8] Ointment form, ensures easy application, better storage along with preservation makes it user friendly.

Thus, here an attempt to re-introduce and validate *Nirvapana Upakrama* one among *Shashti Upakrama* in an ointment form, which enables acceptance of *Nirvapana Upakrama*.

AIM AND OBJECTIVES

Aim

To evaluate the role of *Nirvapana Upakrama* with *Durva* ointment in the management of *Pittaja Dushtavrana* with special reference to fissure-in-ano.

Objectives

1. To evaluate the role of *Nirvapana Upakrama* with *Durva* ointment in the management of fissure-in-ano.
2. To re-evaluate the role of diltiazem 2% gel in the management of fissure-in-ano.
3. To compare the role of *Durva* ointment and diltiazem 2% gel in the management of fissure-in-ano.

MATERIALS AND METHODS

In this study 30 diagnosed cases of fissure-in-ano who fulfilled the inclusion criteria were selected from Out Patient and In Patients Departments of Shalya Tantra, SSCAS&RH, Bengaluru.

Groups of study

Number of thirty subjects suffering from fissure-in-ano fulfilling the inclusion criteria were selected by simple randomization technique. They were divided into two groups of fifteen each. Each group was given sitz bath followed by *Triphala Choorna* (dose 5-10g) at bed time as constipation is the main factor for fissure-in-ano.

Study Design

A randomized controlled clinical trial in which 30 subjects were divided into 2 groups of 15 each.

Clinical Trial	Group A	Group B
Procedure	Diltiazem ointment was applied twice daily after sitz bath.	<i>Durva</i> ointment was applied twice daily after sitz bath.
Dose	Quantity sufficient to cover the ulcer.	Quantity sufficient to cover the ulcer.
Duration	Two weeks	Two weeks
Follow Up	Fourteen days (21 st and 28 th day to observe any recurrence)	Fourteen days (21 st and 28 th day to observe any recurrence)

Diagnostic criteria

Subjects with classical symptoms of fissure-in-ano were selected for study such as *Guda Daha*, *Karthanavat Peeda*, *Anilasanga* and those having characteristics of *Pittaja Dushta Vrana*.

Inclusion criteria

- Clinically diagnosed cases of fissure-in-ano (Chronic Fissure-in-Ano were taken for the study.)
- Patient irrespective of sex, religion, occupation and economic status. Patients between 21-60 years of age irrespective of both sexes.
- Patients of fissure-in-ano with Diabetes and Hypertension which are under control, were also included in study.

Exclusion criteria

- Fissure-in-ano secondary to ulcerative colitis, tuberculosis, syphilis, crohn's disease, and other systemic diseases pertaining to colon were excluded from the study.
- Previously diagnosed cases of Ca - rectum, Ca - colon and fistula-in-ano.

Assessment criteria

Following subjective and objective parameters will be considered in the study.

1) Subjective parameters

- *Gudagata Karthanavat Peeda* (cutting and burning type of pain at anus.)
- Itching
- Bleeding
- Constipation
- Burning sensation
- Pain assessment VAS Scale

Itching^[9]

Grade 0 - Absent (no itching)

Grade 1 - Mild (Occasional itching)

Grade 2 - Moderate (Frequent itching)

Grade 3 - Severe (Continuous itching)

Burning sensation^[9]

Grade 0 - No burning sensation

Grade 1 - Mild burning sensation

Grade 2 - Moderate burning sensation

Grade 3 - Severe Burning sensation.

Bleeding^[1]

Grade 0 - No bleeding

Grade 1 - Bleeding per anum.

Constipation^[1]

Grade 0 - Easy evacuation / Normal consistency

Grade 1 - Hard stools passed once daily

Grade 2 - Hard stools passed once in 2-3 days

Grade 3 - Very hard stools passed once in 3-4 days

2) Objective parameters**(1) Length of ulcer^[1]**

After gently parting the gluteal region, the fissure will be visualized and the length of ulcer is measured with a cotton swab by keeping it over the ulcer. This is later measured in millimetre.

(2) Sphincter spasm^[1] (by per rectal digital examination.)

Grade 0 - Normal

Grade 1 – Spastic

Method of preparation

Durva ointment was prepared under 3 stages

1. Preparation of *Durva Ghrita*.

2. Conversion of *Durva Ghrita* into *Durva Sikta Ghrita*

3. Making and packing of *Durva* ointment

1. Preparation of *Durva Ghrita*.

Equipment's

Vessels, measuring jar, gas stove, big spoons, wooden spatula, filters, tray, mixer grinder, weighing machine, cora cloth, tripod stand.

Ingredients

Durva Panchanga - quantity sufficient, Milk - 2 litre, *Kalka* - 250gm, *Ghrita* - 1 litre, *Durva Swarasa* - 2 litre, *Madhuchista* - quantity sufficient.

- *Durva Panchanga* was collected. Cleaned and washed properly.
- From this *Durva Swarasa* 2L was prepared and *Durva Kalka* 250gm was prepared.
- 1L *Ghrita* was taken in a clean open vessel, to which prepared *Kalka* was added and boiled in *Mandagni* with constant stirring.
- Into that 2 litre of *Durva Swarasa* was added boiled in *Mandhagni* with constant stirring till *Ghrita Siddha Lakshana* were appreciated.
- After cooling down, *Ghrita* was filtered using a clean cloth and store in an air tight container.

2. Conversion of *Durva Ghrita* into *Durva Sikta Ghrita*

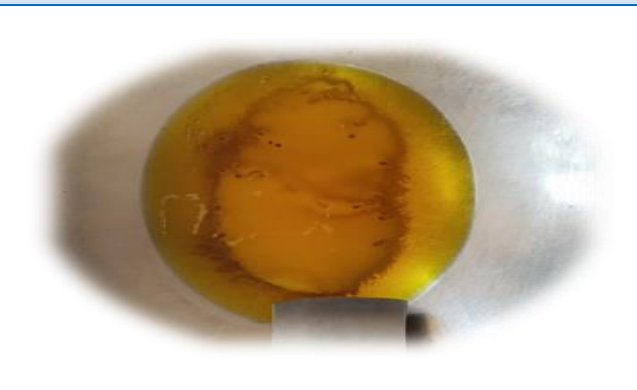
- Filtered liquefied *Madhuchista* was added to warm *Durva Ghrita* in 1:5 ratio respectively to make it a homogeneous mixture - *Durva Sikta Ghrita*.
- A sample of this batch was sent for analysis which are prescribed for *Lepa/ Malahara/ Kalimbu/ Pasai/ Medicated wax/ Cream/ Poultice* mentioned in "Laboratory guide for the analysis of Ayurveda & Siddha formulations", Central council for Research in Ayurveda & Siddha (CCRAS).

3. Making and packing of *Durva ointment*

- The *Durva Sikta Ghrita* was warmed at constant temperature with the help of electric warmer, to maintain the liquid state of the *Ghrita* throughout the process.
- 5ml of *Durva Sikta Ghrita* was poured into containers and allowed to cool down and packing done.



Durva Panchanga



Ghrita



Durva Kalka was added into *Ghrita*



Durva Swarasa was added



Mixture of Ghrita, Durva Kalka, Swarasa and milk



Phenashanti in Ghrita



End product



Durva Ointment

OBSERVATIONS AND RESULTS

Observation during preparation of Durva ointment

- Durva was difficult to pulverize to obtain Swarasa and Kalka.
- 4 kg Durva Panchanga was needed for getting 2L Swarasa and 250 g Kalka.
- Pleasant odour of the preparation was appreciated.

Observations during intervention

- Ointments are the soft semisolid preparations, used for external application to the skin or mucous membrane where medicaments dissolved or suspended or emulsified in the base. (non irritating, uniformly distributed throughout the base, melt at body temperature etc.)^[10]
- Durva ointment seemed to have all the qualities of an ideal ointment.
- Both interventions were easy to apply, non-irritant, maintained adequate moisture and showed no signs of infection.
- It was observed that there was early recurrence in control group.

Results - Analytical result

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Bangalore -560082, Karnataka, INDIA

OINTMENT ANALYTICAL REPORT

Product Name	Durva ointment	Analysis start date	14.02.2022
TEST	RESULTS	SPECIFICATION	TEST METHOD
Physical description	Ointment, green in colour with characteristics odour	Ointment, green in colour with characteristics odour	In-house Method
Acid Value	8.28	NA	In-house Method
Loss On Drying	0.68%	NA	In-house Method
Iodine Value	65.20	NA	In-house Method
Rancidity	Nil	NA	In-house Method
Total fatty matter	97.05%	NA	In-house Method
Thermal stability	Pass	NA	In-house Method
Viscosity	2900000cps Sp94, 0.5rpm	NA	In-house Method
Saponification Value	114.32	NA	In-house Method
Microbiology Test:			
<i>E. coli</i>	Absent	Absent/10gm	In-house Method
<i>Salmonella spp.</i>	Absent	Absent/10gm	In-house Method
<i>Staphylococcus aureus</i>	Absent	Absent/10gm	In-house Method
<i>Shigella spp</i>	Absent	Absent/10gm	In-house Method
<i>Pseudomonas aeruginosa</i>	Absent	Absent/10gm	In-house Method
Total Microbial Count	<10cfu/gm	Limit: NMT 900 CFU/g	In-house Method
Total Yeast & mold	<10cfu/gm	Limit: NMT 100 CFU/g	In-house Method

CONCLUSION: The above tested sample complies with respect to In-house specifications.

Microbiology: *SPK* Analyzed by: *2880* Approved By: *[Signature]*

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Table 1: Between the group comparison (BT & AT) for pain.

Pain	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	14.6	219	99	219	0.638	0.523
	Group B	15	16.4	246				
AT	Group A	15	18	270	75	195	2.408	0.016
	Group B	15	13	195				
FU	Group A	15	16	240	105	225	1	0.317
	Group B	15	15	225				

BT	Group B	15	15.83	237.5	90	210	1.795	0.073
	Group A	15	17	255				
FU	Group A	15	16	240	105	225	1	0.317
	Group B	15	15	225				

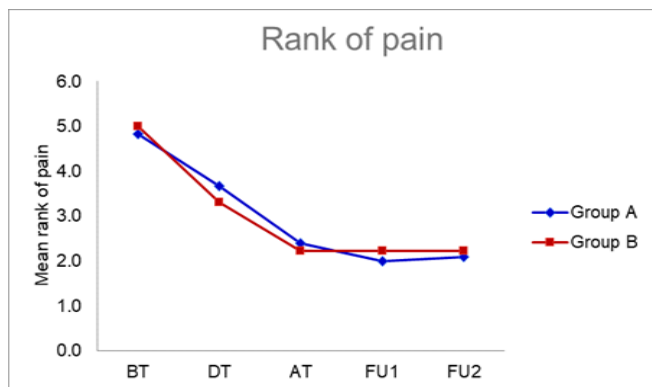
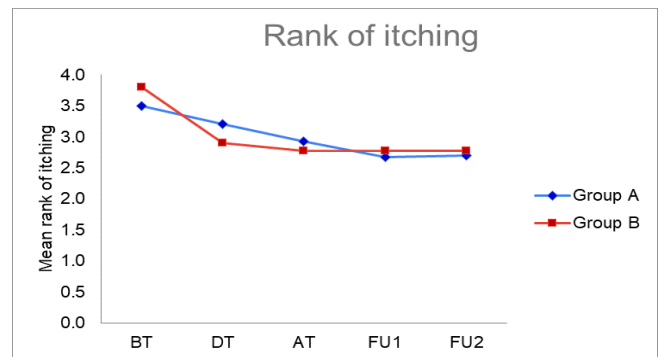


Table 2: Between the group comparison (BT & AT) for itching

Itching	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	15.17	227.5	107.5	227.5	0.249	0.804

Table 3: Between the group comparison (BT & AT) for bleeding

Bleeding	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	15	225	105	225	0.392	0.695
	Group B	15	16	240				
AT	Group A	15	15	225	105	225	1	0.317
	Group B	15	16	240				

FU	Group A	15	16.5	247.5	97.5	217.5	1.439	0.15
	Group B	15	14.5	217.5				

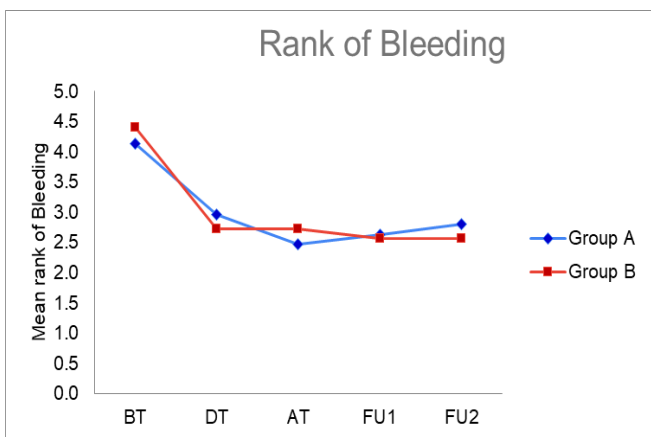


Table 4: Between the group comparison (BT & AT) for burning sensation

Burning Sensation	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	16.4	246	99	219	0.619	0.536
	Group B	15	14.6	219				
AT	Group A	15	18	270	75	195	2.408	0.116
	Group B	15	13	195				
FU	Group A	15	16	240	105	225	1.317	0.177
	Group B	15	15	225				

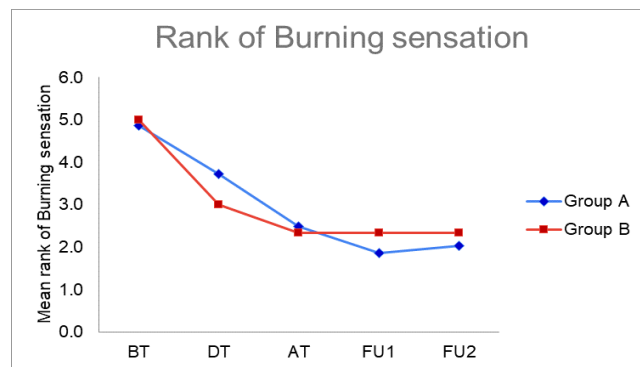


Table 5: Between the group comparison (BT & AT) for constipation

Constipation	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	15.93	239	106	226	0.365	0.715
	Group B	15	15.07	226				
AT	Group A	15	15.5	232.5	112.5	232.5	0	1
	Group B	15	15.5	232.5				
FU	Group A	15	15.5	232.5	112.5	232.5	0	1
	Group B	15	15.5	232.5				

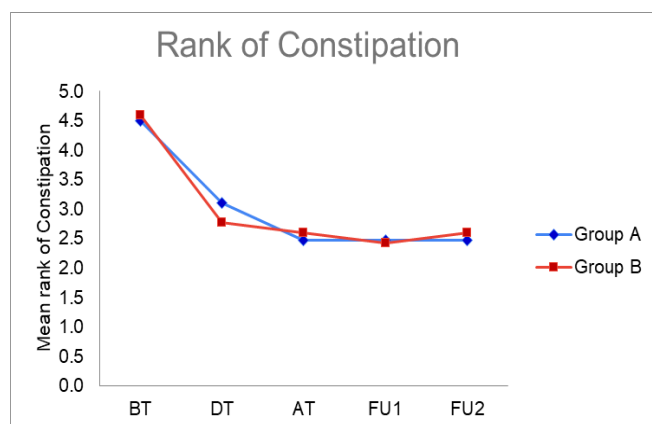


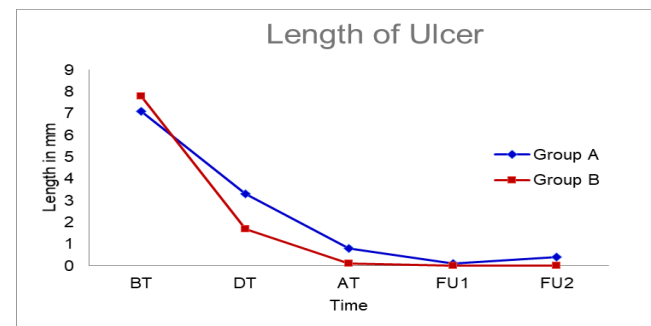
Table 6: Between the group comparison (BT & AT) for sphincter spasm

Sphincter Spasm	Category	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	p
BT	Group A	15	16	240	105	225	0.5988	0.55
	Group B	15	15	225				
AT	Group A	15	16	240	105	225	0.5988	0.55
	Group B	15	15	225				
FU	Group A	15	15.5	232.5	112.5	232.5	0	1
	Group B	15	15.5	232.5				

DT	3.3	2.4	1.7	1.0	2.509	0.018
AT	0.8	1.5	0.1	0.5	1.654	0.109
FU1	0.1	0.3	0.0	0.0	1	0.326
FU2	0.4	1.1	0.0	0.0	1.382	0.178

Table 8: Between the group comparison (BT & AT) for length of ulcer

Change in Length of ulcer (mm)	Group A (n=15)		Group B (n=15)		Unpaired t test	
	Mean	Sd	Mean	Sd	t	p
BT - AT	2.0	0.0	2.0	0.0		
AT - FU2	0.7	0.9	0.1	0.5	1.991	0.056
BT - FU2	2.0	0.0	2.0	0.0		



There was a significant difference before and after the treatment between the groups with high clinical efficacy seen in Group B compared to Group A in respect to subjective and objective parameters.

Limitations

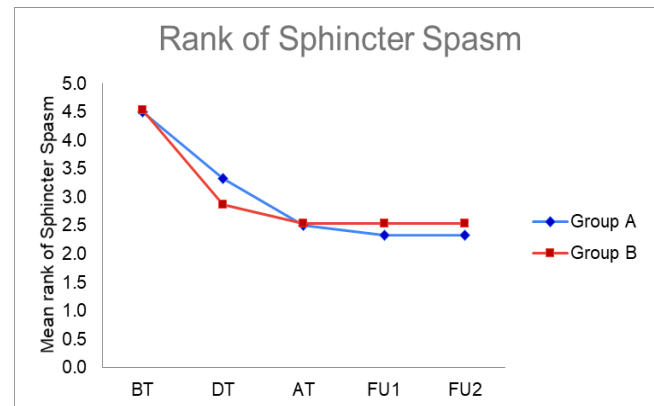
- The adoption of intervention by the subjects were not under the supervision of the principal investigator.
- Availability of fresh *Durva* during all seasons is difficult

Further Scope

- This study is a part of Post Graduate research on small sample. So, it is recommended to be studied on large sample size to create more evidence based data.

Table 7: Between the group comparison (BT & AT) for length of ulcer

Length of ulcer (mm)	Group A (n=15)		Group B (n=15)		Unpaired t test	
	Mean	Sd	Mean	Sd	t	p
BT	7.1	2.0	7.8	2.0	-0.921	0.365

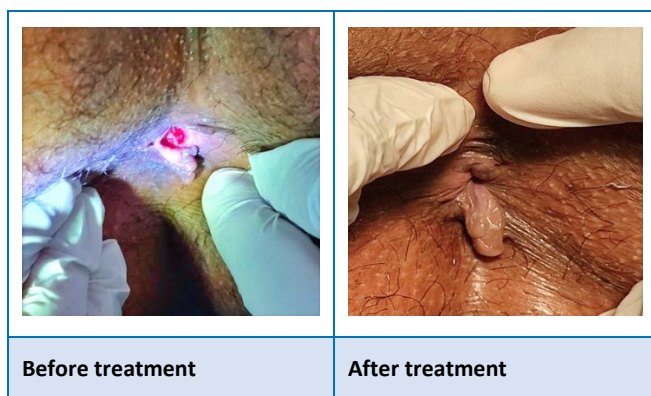


- Along with *Durva* other drugs mentioned by *Acharya* for *Nirvapana Upakrama* can also be tried for proving the efficacy of *Vrana Chikitsa* in the management of fissure in ano.
- Not only *Durva*, combination of all those medicines mentioned in *Misrakadyaya* like *Nalamoola*, *Madhuka*, *Chandana* can be tried as a combination for further study.
- Present study was conducted on chronic fissure-in-ano, similar study can also be concentrated on acute fissure in ano.

Control group



Trial group



DISCUSSION

The pH was slightly acidic. As pH value within the wound milieu directly and indirectly influences all biochemical reactions taking place in the process of wound healing. It has been proven that the surface pH of a wound plays an important role in wound healing as it helps control infection and increase antimicrobial activity, oxygen release, angiogenesis, protease activity, and bacterial toxicity. Hence, pH of the drug may have influenced wound healing.^[11] The presence of required spreadability, viscosity, thermal stability and the absence of rancidity, infers that *Durva* ointment contained right proportion of *Madhuchista* needed for an ointment. The sample was pathogen free and had negligible microbial load, suggestive of safe for therapeutic use.

Pain^[12]

Significant reduction in pain may be due to *Madura Rasa* of *Durva* along with, *Snigdha Guna* of *Goghruta*, *Ksheera* and *Madhuchista* which are the main ingredient of *Durva* ointment, having *Vatahara* property. Also, reduction in pain can be due to presence of Alkaloids, Flavonoids, Saponins and Tannins.

Itching

This may be due to *Kashaya Tikta Rasa* of *Durva* which is helping in the *Kaphahara* property. Bleeding *Raktasthambaka* property along with *Kashaya Rasa*, *Seetha Virya*, *Kapha - Pittahara*, *Raktapitta Samaka* properties of *Durva* helped in reduction of bleeding and also can be due to the presence of Tannins, Saponins, and Glycosides.

Burning sensation^[13]

Nirvapana Upakrama is used for the treatment of *Vrana* accompanied with *Daha*, *Paka*, *Jwara* and having *Pitta Kopa* and *Raktena Abhibhuta*. Here *Acharya* mention to give *Seetha Guna Dravyas* macerated in *Ksheera* added with *Ghee* to be applied as a *Lepa*. Properties of *Durva* like *Kashaya Rasa*, *Seetha Virya*, *Kapha Pittahara*, *Raktapitta Samaka* and *Daha Samana* property along with *Madura Rasa*, *Snigdha Guna*, *Pittahara* and *Dahasamana* properties of *Ghritha* and *Payas* helped in the reduction of burning sensation.

Wound healing^[14]

Vrana Ropana property of *Madhuchista* along with *Kashaya Rasa*, *Seetha Virya*, *Kapha-Pittahara*, *Raktapitta Samaka* property of *Durva* might have led to *Vrana Ropana*. The flavonoids present in *Durva* facilitate the healing process by increase in collagen and protein and decrease in lipid peroxide found during the inflammation.

Sphincter spasm^[12]

Ghritha helps in reduction of the *Rookshata* of *Vata* and maintains normal tone of muscles. Flavanoids which are present in *Durva* having wound healing and *Vedanasthapana* properties helps in relaxation of sphincter. *Durva* is also having *Madura Rasa*, *Seetha Virya* which also aids in the *Vatashamana*.

Summarizing all results

Contemplating all these findings, it can be inferred that *Durva* ointment delivered better results than diltiazem gel in the management of fissure-in-ano.

CONCLUSION

Fissure is a longitudinal split in the anoderm of the distal anal canal which extends from the anal verge proximally towards, but not beyond, the dentate line. It is commonly seen in posterior bed due to direct pressure of stool and also due to less muscular support at the posterior aspect of the anus. In the classics we are not getting the apt correlation for fissure-in-ano as an individual disease; by seeing the signs and symptoms we can consider it as one among the six

varieties of *Dushta Vrana* i.e., *Pittaja Dushtavrana*.^[5] Even though treatment modality includes both conservative and surgical techniques, prolonged convalescent period, continuous mucous discharge, hematoma formation, recurrent ulcer formation, risk of damage to the underlying sphincter and recurrence are the most common drawbacks seen in conventional treatment. Both the groups showed high statistical significance when compared within the group before and after treatment also during follow-up. Rapid reduction in pain, burning sensation and length of ulcer was observed in the subjects who were given trial drug comparing to the control drug. Overall clinical effect size with respect to majority of parameter is much higher in group B comparing to group A, clearly showing its superiority to Group A. Trial Group has shown better clinical and statistically significant result compared to control group. Therefore rejected null hypothesis and accepted alternate hypothesis [H1: The efficacy of *Durva* ointment in fissure-in-ano is better than the group receiving diltiazem gel 2%]

REFERENCES

1. Banu N. Efficacy of Ashtanga Matrabasthi in the management of Parikarthika w.s.r. to Fissure-In- Ano [Dissertation]. Govt.Ayurveda Medical College Mysore, Karnataka: R.G.U.H.S, Bangalore, Karnataka; 2011-12.
2. Ranjit Chaudary, Chirag Shanthi Dausage. Prevalence of Anal Fissure in patients with Anorectal Disorders: A single – centre experience. Journal of Clinical and Diagnostic Research, 2019 Feb; Vol-13(2): PC05-PC07.
3. Das S. A Concise Textbook of Surgery, 10th edition. Kolkata: Dr. S. Das .13; 2018. P.1083-86.
4. Susruta, Susruta Samhita, edited by Vaidya Jadavaji Trikamji Acharya and Narayan Ram Acharya 'Kavyatirtha'. Chikitsasthana.Ch.34, Ver.16. Reprint, 2015 edition, Varanasi: Choukhambha Sanskrit Sansthan, Kashi Sanshrit series 316; 2015.p.523-24.
5. Susruta, Susruta Samhita, edited by Vaidya Jadavaji Trikamji Acharya and Narayan Ram Acharya 'Kavyatirtha'. Chikitsasthana.Ch.1,Ver.8. Reprint, 2015 edition, Varanasi: Choukhambha Sanskrit Sansthan, Kashi Sanshrit series 316;2015.p.397.
6. Susruta, Susrutasamhita, edited by Vaidya Jadavaji Trikamji Acharya and Narayan Ram Acharya

- 'Kavyatirtha'.Chikitsasthana. Ch.1,Ver.49-50. Reprint, 2015 edition Varanasi: Choukhambha Sanskrit Sansthan, Kashi Sanshrit series 316;2015.p.401.
7. Susruta, Susruta Samhitha, edited by Vaidya Jadavaji Trikamji Aacharya and Narayan Ram Acharya 'Kavyatirtha'. Soothrasthan.Ch.37,Ver.4. Reprint, 2015 edition, Varanasi: Choukhambha Sanskrit Sansthan, Kashi Sanshrit series316;2015.p.160.
 8. Tichkule SV, Khandare KB, Shrivastav PP. Proficiency of Khanduchakka Ghrita in the management of Parikarthika: A case report. J Indian Sys Medicine [serial online] 2019; 7:47-50.
 9. Hiremath SG. A Textbook of Bhaishajya Kalpana (Indian Pharmaceutics). 17 Reprint, 2011 edition, Banglore: IBH Prakashana;p.476.
 10. Basavaraj SN, Namdev MS, Bharat Wadher, Sohan Selkar. Acidic Environment and Wound Healing: A Review [Internet]. 2015 Jan;27(1):5-11.
 11. Waldiceu A.VerriJr, Fabiana T.M.C, Vicentini, Marcela M.Baracat, Sandra R.Georgett, Renato D.R.Cardoso, Thiago M.Cunha. Flavonoids as Anti-Inflammatory and Analgesic Drugs: Mechanisms of Action and Perspectives in the Development of Pharmaceutical Forms. Studies in Natural Products Chemistry [Internet]. 2012 Feb; 32(36): 297-330.
 12. Fatemeh E, Mohammadali T, Javad M, Hadi V. Medicinal Plants as Potential Hemostatic Agents. NIH[Internet]. 2020 Dec;23(1):10-23.
 13. Meenakshi, Narendra Singh Shekhawat, Rajesh Gupta, Prof. O. P. Dave. A Comparative Clinical Study Of Durvadi Ghrita And Tankan Kshara In The Management Of Guda-Parikartika (Fissure-in-ano). Wjpmr[Internet], 2017,Aug;3(9) : 270-274.

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