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ANATOMICAL DISTRIBUTION OF SHUSHKA AND ARDRA ARSHA ACROSS CLASSICAL GUDA VALIS: A CROSS-SECTIONAL PROCTOSCOPIC STUDY

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ABSTRACT:
Background: Classical Ayurvedic texts describes three functional Guda Valis within the anorectal region: Pravahini, Visarjaniand Samvarani. Arsha is broadly correlated with hemorrhoidal disease and is clinically classified as Shushka (non-bleeding piles) and Ardra Arsha (bleeding piles). Whether these phenotypes show site-specific distribution across the Guda Valis has not been evaluated in a clinical cohort.
Objective: To assess the anatomical distribution of Shushka and Ardra Arsha across the three Guda Valis and examine associations with grade and anatomical position.
Methods: This is Single-centre cross-sectional study included 80 patients aged 25-50 years with clinically diagnosed Arsha. Participants undervent structured Ayuvedic assessment, inspection, digital rectal examination and proctoscopy. The primary analysis tested the association between Guda Vali location and Arsha type. Pearson chi-square, Fisher exact and Monte Carlo chi-square tests (10,000 simulations for sparse multi-category tables) were used, with a two-sided significance level of 0.05.
Results: Ardra Arsha was present in 54/80 participants, while 26/80 had Shushka Arsha. The predominant location was Samvarani Vali (71.3%), followed by Visarjani(26.3%) and Pravahini (2.5%). Distribution of Shushka and Ardra Arsha did not differ significantly across the Valis. Vali location was associated with grade of Arsha. Grade distribution differed between Shushka and Ardra groups, although the pattern was not a monotonic shift toward advanced grades. Burning was reported in 20/54 Ardra cases and 4/26 Shushka cases.
Conclusion: In this clinic-based sample, Guda Vali location did not distinguish bleeding from non-bleeding Arsha. However, the marked concentration of cases in the Samvarani Vali and the association of Vali location with special presentation and grade support the clinical relevance of anatomical mapping. Multicentre studies using a standardized proctoscopic atlas, assessor- reliability testing and objective imaging are needed.
KEYWORDS: Guda Vali, Arsha, Hemorrhoids, proctoscopy, Samvarani, cross-sectional study, anorectal ring

INTRODUCTION

Hemorrhoidal disease is a common anorectal condition arising when the normal anal cushions become enlarged, displaced or symptomatic. Current models emphasize a combination of vascular engorgement, deterioration of supporting connective tissue, downward sliding of the cushions, mucosal prolapse and altered anal pressure rather than simple varicosity alone.1-4 The clinical burden is substantial, although prevalence estimates vary widely with population, definition and diagnostic method. A recent global synthesis reported a pooled point prevalence of approximately 26%, while contemporary guidelines continue to stress careful clinical examination because rectal bleeding and anorectal symptoms have important differential diagnosis.1-5

Constipation and disordered defecation are frequently discussed in relation to hemorrhoidal disease. A systematic review found functional constipation to be more common among patients with hemorrhoids than among controls and also noted higher basal anal pressures in manometric studies.6 Nevertheless, causality remains incompletely resolved, and cross-sectional observations must be interpreted as associations rather than proof of a directional mechanism. Large screening cohorts also show that hemorrhoidal disease is heterogeneous and associated with a mixture of demographic, lifestyle and metabolic factors.7

In Ayurved, Rachana Sharir describes Guda as a functionally specialized terminal segment of the alimentary tract. In Sushruta Samhita, three internal folds or zones are named Pravahini, Visarjani and Samvarani, traditionally associated with propulsion, expulsion and closure or continence, respectively.8 Contemporary Ayurvedic anatomical literature has proposed correlations between these descriptions and components of the lower rectum, anorectal junction and sphincter complex; however, these correlations are interpretive and should not be treated as exact one-to-one structural identities.9-11

Arsha is a classical disorder of the Guda region and is broadly correlated with hemorrhoidal disease. Two clinically important presentations are Shushka Arsha, characterised as dry and non-bleeding, and Ardra Arsha, characterised as moist or bleeding. This classification captures a clinically recognizable distinction but also creates an important analytical constraint: bleeding is part of the phenotype definition and therefore cannot be

treated as an independent validating outcome. While Arsha has been extensively studied in relation to symptoms and management, the anatomical distribution of these two phenotypes across the three Guda Valis has received little clinical investigation.

The present study therefore assessed patients with Arsha using a structured Ayurvedic evaluation combined with inspection, digital rectal examination and proctoscopy. The primary objective was to determine whether Shushka and Ardra Arsha differed in distribution across Pravahini, Visarjani and Samvarani Valis. Secondary analyses explored relationships between Vali location, anatomical position, grade and selected clinical characteristics. The prespecified null hypothesis was that the proportion of Shushka and Ardra Arsha would not differ across the three Valis.

MATERIALS AND METHODS

2.1 Study design and reporting

A single- centre cross sectional observational study was conducted in the Department of Shalya Tantra in collaboration with the Department of Rachana Sharir, Ch. Brahm Prakash Ayurved Charak Sansthan, Khera Dabar, New Delhi. The study duration was 12 months. This manuscript was prepared with reference to the STROBE recommendations for cross-sectional studies.12

2.2 Ethics and registration

The Institutional Ethics Committee approved the protocol (CBP-IEC/2024/RS/MD/05). The study was prospectively registered with the Clinical Trials Registry-India (CTRI/2025/03/083480). Written informed consent was obtained before clinical and proctoscopic examination. The study was conducted in accordance with applicable institutional ethical standards.

2.3 Study Population

Patients aged 25-50 years with previously or newly diagnosed Arsha, irrespective of sex, grade, caste or religion, were eligible when they consented to digital rectal examination and proctoscopy and provided reliable contact details. Patients were excluded if Arsha coexisted with fissure-in-ano, fistula-in-ano or rectal prolapse; if secondary complications were present; or if they had diabetes mellitus, tuberculosis, human immunodeficiency virus infection, hepatitis B, congenital disease, malignancy or pregnancy-associated piles. Patients outside the prespecified age range were also excluded.

The dissertation records simple random sampling among eligible clinic attendees. A total of 80 enrolled patients completed the assessment and were included in the analysis, no missing outcome data were reported.

2.4 Sample size calculation

The target sample was calculated using the single-proportion formula $n=Z^2p(1-p)/d^2$, with $Z=1.96$, an assumed proportion of 5% and absolute precision of 5%. The calculated sample was 72.99 and was rounded upward to 80. Because the analysis was ultimately based on cross-tabulated subgroups rather than estimation of a single overall prevalence, sparse cells remained possible, particularly for the Pravahini category.

2.5 Clinical assessment and variable definitions

A structured case-research proforma captured sociodemographic characteristics, dietary and bowel habits, selected Ayurvedic variables including Kostha and Prakriti, symptom profile and disease history. Local examination comprised visual inspection, digital rectal examination and proctoscopy. The examiner documented site, anatomical position, number and surface of pile masses, sphincter tone, tenderness, bleeding, pain, itching, burning, discharge, inflammation and conventional hemorrhoidal grade.

Arsha type was classified as Shushka when the lesion was dry/non-bleeding and as Ardra when a bleeding or moist phenotype was present, according to the study's classical clinical criteria. Anatomical position was recorded as Bahya (external), Abhyantar (internal) or Ubhayata (combined internal–external). Grades I–IV were assigned using the standard prolapse-based clinical classification.

For Guda Vali mapping, the anorectal passage was interpreted as three successive functional zones derived from the classical description of a 4.5-Angula Guda with Valis at approximately 1.5-Angula intervals [8]. Pravahini was treated as the proximal lower-rectal/propulsive zone, Visarjani as the intermediate evacuation zone, and Samvarani as the distal closure/continence zone near the anorectal ring and dentate-line region. The mapping was functional and topographic, not an assertion that each Vali is identical to one isolated modern structure. During proctoscopy, the predominant lesion was assigned to the corresponding proximal, middle or distal zone. The dissertation does not provide a sufficiently detailed reproducibility algorithm for boundary adjudication; this is addressed as a limitation.

Image 1. Insertion of Proctoscope in the Anal Canal

Image 2. Proctoscopic examination of Anal Canal

2.6 **Outcomes**

The primary outcome was the association between Guda Vali location (Pravahini, Visarjani or Samvarani) and Arsha type (Shushka or Ardra). Secondary outcomes included associations of Arsha type with grade and symptoms, and associations of Vali location with anatomical position and grade. The distributions of demographic, behavioral, constitutional and clinical variables were summarized descriptively.

2.9 Statistical analysis

Categorical variables were summarized as frequencies and percentages. Associations were evaluated using Pearson's chi-square test. Fisher's exact test was used to confirm selected 2×2 analyses when cell counts were small. For sparse multi-category contingency tables, chi-square p values were estimated by Monte Carlo simulation with 10,000 replicates. All tests were two-sided and $p<0.05$ was considered statistically significant. Because secondary comparisons were exploratory and no multiplicity correction was prespecified, their p values should be interpreted cautiously.

RESULTS

3.1 Participant profile

All 80 enrolled participants were analyzed. Twenty-two participants (27.5%) were aged 25–32 years, and 29 each (36.25%) were aged 33–41 and 42–50 years. Men comprised 71.25% of the cohort, 78.75% resided in urban areas and 91.25% reported sedentary or moderately active work. Constipation was present in 70 participants (87.5%; 95% CI 78.5–93.1). Vishamashana and Adhyashana together accounted for 81.25% of recorded dietary patterns, while Ati Snigdha Ahara was the most frequently recorded single Nidana (41.25%). Vata-containing dual Prakriti categories predominated, with Vata–Pitta in 50.0% and Vata–Kapha in 26.25%.

Table 1. Selected characteristics of the study population (N=80)

Characteristic	**Category**	**n (%)**
Age, years	25–32	22 (27.50)
	33–41	29 (36.25)
	42–50	29 (36.25)
Sex	Male	57 (71.25)
	Female	23 (28.75)
Habitat	Urban	63 (78.75)
	Rural	17 (21.25)
Nature of work	Sedentary	34 (42.50)
	Moderate physical activity	39 (48.75)
	Heavy labour/other	7 (8.75)
Dietary timing pattern	Samashana	15 (18.75)

Characteristic	Category	n (%)
	Vishamashana	35 (43.75)
	Adhyashana	30 (37.50)
Bowel habit	Constipation	70 (87.50)
	Other	10 (12.50)
Predominant Nidana	Ati Snigdha Ahara	33 (41.25)
	Ruksha Ahara	20 (25.00)
	Adhyashana	13 (16.25)
	Ati Guru Ahara	10 (12.50)
	Vega Dharana	4 (5.00)
Prakriti	Vata–Pitta	40 (50.00)
	Vata–Kapha	21 (26.25)
	Pitta–Kapha	17 (21.25)
	Single-Dosha categories	2 (2.50)

3.2 Distribution of Arsha type and anatomical findings

Ardra Arsha was identified in 54 participants (67.5%), and Shushka Arsha in 26 (32.5%). Samvarani was the predominant Vali location (57, 71.25%), followed by Visarjani (21, 26.25%) and Pravahini (2, 2.5%). Internal and combined internal–external anatomical positions each accounted for 45.0%, while purely external lesions accounted for 10.0%. Grade II was the commonest grade (50.0%), followed by Grade I (26.25%), Grade IV (13.75%) and Grade III (10.0%).

Table 2. Clinical and anatomical distribution of Arsha (N=80)

Domain	Category	n (%)
Arsha type	Shushka	26 (32.50)
	Ardra	54 (67.50)
Guda Vali	Pravahini	2 (2.50)
	Visarjani	21 (26.25)
	Samvarani	57 (71.25)
Anatomical position	Bahya	8 (10.00)
	Abhyantar	36 (45.00)
	Ubhayata	36 (45.00)
Modern clinical site	Internal	37 (46.25)
	External	8 (10.00)
	Internal–external	35 (43.75)
Grade	I	21 (26.25)
	II	40 (50.00)
	III	8 (10.00)
	IV	11 (13.75)
Burning	Present	24 (30.00)

Domain	Category	n (%)
	Absent	56 (70.00)
Sphincter tone	Normal	40 (50.00)
	Decreased	21 (26.25)
	Increased	19 (23.75)

3.3 Primary analysis: Guda Vali location and Arsha type

Both phenotypes occurred most often in Samvarani. Among the 57 Samvarani cases, 36 were Ardra and 21 were Shushka; among 21 Visarjani cases, 17 were Ardra and 4 were Shushka; the two Pravahini cases comprised one of each type. The distribution did not differ statistically across the three Valis (χ^2=2.501, df=2, Monte Carlo p=0.2535). The corresponding Cramér's V, calculated from the reported contingency table, was 0.177, indicating a small association. The prespecified null hypothesis was therefore not rejected.

Table 3. Association between Guda Vali location and Arsha type

Guda Vali	Shushka, n	Ardra, n	Total, n (%)
Pravahini	1	1	2 (2.50)
Visarjani	4	17	21 (26.25)
Samvarani	21	36	57 (71.25)
Total	26	54	80 (100.00)

Statistical test: chi-square with Monte Carlo p value (10,000 simulations); χ^2=2.501, df=2, p=0.2535.

3.4 Exploratory associations with Arsha type

Grade distribution differed between Shushka and Ardra groups (χ^2=8.182, df=3, Monte Carlo p=0.0320). The pattern was driven principally by a higher relative frequency of Grade I in Ardra (19/54, 35.2%) than Shushka (2/26, 7.7%), and a higher relative frequency of Grade II in Shushka (18/26, 69.2%) than Ardra (22/54, 40.7%). Combined Grade III–IV disease was similar in the two groups (24.1% in Ardra versus 23.1% in Shushka), so the association should not be described as a simple monotonic increase in severity among Ardra cases.

Burning was present in 20/54 Ardra cases (37.0%) and 4/26 Shushka cases (15.4%), yielding χ^2=3.918, df=1, p=0.0478. This borderline result was not adjusted for multiple comparisons and should be considered exploratory. Bleeding showed a perfect association with type because bleeding status formed part of the Shushka–Ardra case definition; it was therefore treated as a classification check rather than an independent biological finding. Age, sex, habitat, diet, Kostha, bowel habit, disease chronicity, Prakriti, sphincter tone and itching were not significantly associated with type in the reported bivariate analyses.

Table 4. Selected associations with Shushka and Ardra Arsha

Variable/category	Shushka, n (%) (n=26)	Ardra, n (%) (n=54)	Test result
Grade I	2 (7.69)	19 (35.19)	
Grade II	18 (69.23)	22 (40.74)	
Grade III	2 (7.69)	6 (11.11)	
Grade IV	4 (15.38)	7 (12.96)	χ^2=8.182; df=3; p=0.0320*
Burning present	4 (15.38)	20 (37.04)	
Burning absent	22 (84.62)	34 (62.96)	χ^2=3.918; df=1; p=0.0478†

*Monte Carlo chi-square p value (10,000 simulations). †Pearson chi-square, also checked by Fisher exact test in the dissertation.

3.5 Guda Vali location and grade

Vali location was also associated with grade (χ^2=25.311, df=6, Monte Carlo p<0.001; reported simulated p=0.0008). All 11 Grade IV lesions occurred in Samvarani; however, both Pravahini lesions were Grade III, illustrating the instability introduced by the very small Pravahini cell. The calculated Cramér's V values were

0.352 for anatomical position and 0.398 for grade, consistent with moderate associations in this dataset.

Table 5. Associations of Guda Vali location with grade

Guda Vali	Grade I	Grade II	Grade III	Grade IV	Total
Pravahini	0	0	2	0	2
Visarjani	8	10	3	0	21
Samvarani	13	30	3	11	57

Statistical tests: anatomical position, $\chi^2=19.877$, df=4, p=0.0052; grade, $\chi^2=25.311$, df=6, p<0.001 (reported Monte Carlo p=0.0008).

4. DISCUSSION

4.1 Principal findings

This study translated a classical anatomical concept into a clinical proctoscopic framework and tested a clearly defined primary hypothesis. Ardra was more frequent than Shushka in the clinic-based cohort, and almost three-quarters of all cases were assigned to Samvarani. Despite this concentration, the relative proportions of Shushka and Ardra did not differ significantly across Pravahini, Visarjani and Samvarani. The principal negative result is scientifically important: within the limits of this sample and mapping method, Vali location did not discriminate bleeding from non-bleeding phenotype.

Secondary analyses suggested that Vali location was related to the spatial form and grade of disease. Visarjani was predominantly associated with internal lesions, while all purely external lesions and all Grade IV lesions were recorded in Samvarani. These patterns are anatomically plausible because the distal anorectal region contains the anal cushions, transition zones and sphincteric structures that govern prolapse, closure and visible external extension2-5. Nevertheless, plausibility should not be mistaken for proof. The cross-sectional design, sparse cells and interpretive mapping prevent causal statements such as “Vali location determines severity.” The defensible conclusion is that grade and anatomical position differed by assigned Vali in this cohort.

4.2 Interpretation of the primary outcome

The absence of a significant Vali-by-type association may indicate that local anatomical level is not the main discriminator between Shushka and Ardra. Both phenotypes can arise within the same zone, while vascular fragility, mucosal trauma, inflammation and patient-level factors may influence whether bleeding is clinically evident. An equally important explanation is limited statistical resolution: only two participants were assigned to Pravahini, producing wide uncertainty and a low-information comparison. The small Cramer’s V supports a weak observed relationship, but a non-significant result does not establish equivalence.

A further conceptual issue is that Ardra and Shushka were defined largely through bleeding status. This makes the phenotype clinically practical, but it narrows the biological construct and explains why bleeding showed a perfect statistical association with type. Future work should use a multidimensional, prespecified phenotype that separates bleeding intensity, moisture or discharge, mucosal appearance, prolapse, thrombosis and inflammatory signs. Such an approach could test whether classical categories map onto clinically distinct clusters rather than a single defining symptom.

4.3 Samvarani predominance and anatomical correlation

The marked predominance of Samvarani is the study’s most striking descriptive finding. In the working anatomical model, Samvarani is the lowermost functional zone near the dentate-line/anorectal-ring region and corresponds most closely to closure and continence. This region also contains the structures through which internal cushion descent becomes clinically visible, and it is exposed to repeated shear, mucosal prolapse and pressure during defecation2-4. These features provide a credible framework for the observed concentration of lesions.

However, classical Guda Valis should be understood as integrated functional zones, not as fixed modern anatomical lines9-11. Transverse rectal folds vary among individuals, and the boundaries of the anorectal ring, dentate line and sphincteric components cannot be reduced to patient-specific Angula intervals without validation. The present study therefore supports the clinical usefulness of a distal–middle–proximal mapping scheme, but it does not establish definitive structural homology. A standardized atlas validated against endoanal ultrasonography, MRI defecography or surgical anatomy would make this concept more reproducible.

4.4 Constipation and clinical profile

Constipation was recorded in 87.5% of participants, a finding consistent with literature showing greater co-occurrence of functional constipation and hemorrhoids and higher anal pressures among affected patients6. Repeated straining and impaired relaxation may increase stress on the anal cushions, although this study cannot establish directionality because it had no non-Arsha comparison group and measured exposure and disease simultaneously. The high frequency may also reflect referral patterns in an anorectal clinic and the way bowel habit was elicited.

The cohort was predominantly male, urban and engaged in sedentary or moderately active work. These observations describe the service population rather than independent risk factors. Several large datasets report different sex patterns and show that associations may vary by age, parity, adiposity and diagnostic setting1,7.

Accordingly, the present demographic proportions should not be generalized as population prevalence or interpreted causally.

4.5 Grade and symptom findings

The significant omnibus association between grade and Arsha type deserves more nuanced interpretation than a statement that Ardra presents at higher grades. Grade I was proportionally more frequent in Ardra and Grade II more frequent in Shushka, whereas the combined proportions of Grades III–IV were nearly identical. The result therefore reflects a redistribution across categories, not a linear severity gradient. This distinction is important for avoiding overinterpretation of an omnibus chi-square test.

Burning was more frequent in Ardra than Shushka, which may be clinically compatible with a more inflamed or irritated bleeding phenotype. Yet the p value was close to the significance threshold, the confidence around the effect is likely broad and multiple exploratory tests were performed without adjustment. This finding should be treated as hypothesis-generating and tested in a larger sample with explicit symptom scales and blinded assessment.

4.6 Strengths and limitations

The study has several strengths. It addressed a clearly identified gap, combined classical Ayurvedic assessment with modern anorectal examination, enrolled a complete 80-patient cohort, used Monte Carlo procedures for sparse categorical tables, registered the protocol and transparently reported a negative primary finding. Reanalysis of the tabulated counts also allows more precise interpretation of the grade association and estimation of effect-size magnitude.

The limitations are substantial. First, the single-centre clinic-based sample, restricted to ages 25–50 years, limits external validity and does not permit estimation of population prevalence. Second, the Pravahini group contained only two participants, making estimates unstable. Third, the proctoscopic mapping of Guda Vali was based on an interpretive functional model; objective boundary criteria, interobserver agreement and examiner blinding were not documented. Finally, the study involved multiple bivariate secondary comparisons without multiplicity correction.

4.7 Implications for research and practice

For clinical documentation, recording the predominant lesion by distal, middle and proximal anorectal zone may add anatomical detail beyond type and grade alone. At present, the data do not justify using Vali location to predict whether Arsha will bleed. They do support further study of whether distal Samvarani involvement is associated with external extension, prolapse or procedural complexity.

Future studies should be multicentric and prospectively powered for the primary Vali-by-phenotype comparison. They should use a written mapping protocol with photographic examples, two independent assessors, inter-rater reliability statistics and objective anatomical validation. A broader age range, consecutive recruitment, non-Arsha controls and multivariable analysis would help separate referral patterns from disease associations. Longitudinal follow-up could determine whether Vali location predicts progression, recurrence or response to Ayurvedic and conventional interventions.

5. CONCLUSION

Among 80 patients with Arsha, Ardra was more common than Shushka and Samvarani was the predominant assigned Guda Vali location. The primary analysis found no statistically significant difference in Shushka–Ardra distribution across the three Valis. Vali location was associated with anatomical position and grade in exploratory analyses, but sparse cells and subjective mapping limit certainty. The findings support Guda Vali as a clinically interesting anatomical framework rather than a proven determinant of hemorrhoidal phenotype or severity. Standardized, imaging-validated and multicenter studies are required before the correlations can be used for prognosis or treatment selection.

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