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A Correlative Study of *Guda* (Anorectal Region) Described in Literatures of *Ayurveda* with Contemporary Knowledge of Anatomy

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Abstract

Background: *Guda* is the terminal part of the large intestine. *Guda* is a passage through which excretes the flatus and faeces. It is one of the *Bahirmukh Srotas, Pancha Karmendriyas, Dashpranayatanas* and also *Muladhara Chakra* which is placed in the pelvic region. *Guda* is characterized as *Moola* of *Purishvaha Srotas* and is also related to *Annavaha Srotas.* **Aim:** To elaborate literary review of *Guda Pradesh* with the correlation of anatomical significance described in *Ayurveda* to contemporary science. **Discussion:** *Acharya Charak* mentioned the *Guda* in one of 15 *Koshthhangas*. He considers two parts that are *Uttar Guda* and *Adhar Guda*. Embryologically it is obtained from *Matrij Bhava*. The total length of the *Guda* is 4 and ½ *Angulas*. There are three *Valies* named *Pravahini, Visarjani* and *Samvarani* which present inside the *Guda* at a distance of one and half *Angulas* from each. *Guda* is related to *Purishdhara Kala*. *Acharya Sushruta* mentioned the *Guda* as a *Marma* and considered it as *Sadhyapranahara Marma*. The diseases related to *Guda* are *Arsha, Bhagandara, Parikartika, Nadivrana, Gudabhramsha, Sanniruddha Guda, Gudavidradhi* etc. *Guda* is one of the *Sthana* of *Apana Vata*, and the best *Chikitsa* of *Vata* is *Basti karma*. *Basti* is administered through the *Guda.* **Conclusion:** In this regard, it is concluded that knowledge of *Guda* as described in *Charak Samhita, Sushruta Samhita*, and *Ashtanga Hridayam* is scattered from here, and it is very helpful for understanding the anatomical positions, diseases and pathogenesis as well as treatment.

Keywords: *Adhar Guda, Guda, Guda Marma, Guda Vali, Purishvaha Srotas, Uttar Guda*

1. Introduction

Ayurveda is *the Upveda* of *Atharvaveda* and is one of the oldest holistic medical systems in the world. The main aim of *Ayurveda* is to protect the health of *Swastha* (healthy person) and cure the *Atura* (patients) from the disease. In *Ayurveda*, *Sharir* is divided into six parts that are 4 *Shakha* (extremities), *Madhyam* (trunk or *Koshthha*), and *Shira* (head and neck).

Discussion about the anatomical details of *Guda* like- embryological development, *Nirukti*, blood supply, function, modern review, applied aspects, and management, etc. are scattered in classical *Ayurvedic Samhitas*.

2. Aim and Objective

To elaborate the literary review of *Guda Pradesh* (anorectal region) with the correlation of anatomical significance

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described in the literature of *Ayurveda* and as well as contemporary science.

3. Method

References and data about *Guda Pradesh* are collected from various *Ayurvedic* textbooks and modern texts. From *Brihatrayi*, previous work done related to *Guda* along with a detailed study of *Ayurveda* as well as modern on the topic was reviewed and relevant information was collected.

4. Discussion

4.1 Anatomy of *Guda*

4.1.1 *Vyutpatti (Gu + da)*

Gu = *Mala* or *Vishthha* and *Da* = To give, the overall meaning is that, the organ which gives *Mala* /faeces[1].

4.1.2 *Nirukti*

In *Ayurvedic Shabda Kosha* "*Guda* is the organ which evacuates *Apana Vayu*".

4.1.3 *Synonym*

Parashar Samhita	-	*Apana, Guda, Payu, Braghana*
Charak	-	*Uttar Guda, Adhar Guda, Sthula Guda*
Sushruta	-	*Gudamandala, Gudavalaya, Payuvalaya, Gudoshta*
Vagbhatta	-	*Gudamarga*
Dalhana	-	*Gudantram*
Amarkosh	-	*Apanam*
Vijayrakshita	-	*Apanah*

4.1.4 *The Embryological Aspect of Guda*

Embryologically it is developed by *Matrij Bhava* (maternal source)[2]. *Antra, Guda* and *Basti* are formed from the essence *(Prasad Bhag)* of *Rakta*, and *Kapha* is digested by *Pitta* along with the help of *Vayu*[3]. Acharya Bhadra Shonak hypothesized in a conference which is coated in *Charak Sharir Sthana* that *Pakvashaya* and *Guda* are those organs which are developed at the very first stage in the foetus. Whereas *Acharya Atreya* disproves his hypothesis and explains the ultimate opinion of lord *Dhanwantri* that all organs developed simultaneously from the beginning[4].

4.1.5 *Measurement of Guda*

Acharya Sushruta and *Vagbhatta* mentioned the total length of *Guda* is 4 and ½ *Angulas*[5]. The *Parimana* of *Guda* is *Atmpanitala* (palm of hand) which is described by *Acharya Vagbhatta*[6]. *Acharya Dalhana* recognized one *Angula* is the maximum width of a thumb[7], which is practically equal to 2 cm. Therefore, all over the length of *Guda* is 4.5 *Angulas* or 9 cm, and the total length of the rectosigmoid junction to the anal verge is 16.5 cm.

4.2 Location (*Sthana*)

Acharya Sushruta mentioned that *Guda* is attached to *Sthulantra* (large intestine)[8]. Normal functions of excretion of flatus and faeces are performed by *Apana Vayu*. When it deviates produces *Basti* and *Guda-related* diseases[9].

4.3 *Swaroop*

Guda seems like *Shankha Nabhi* (conch shell) having many spirals in shape, may be correlated with anteroposterior and lateral curvatures of the rectum and anal canal[8].

4.4 Parts of *Guda*

Acharya Charak described the *Uttar Guda* and *Adhar Guda* among the 15 *Koshthhangas* and *Gudoshthha*[10]. *Acharya Chakrapani* explained that *Uttar Guda* (distal Rectum) is a faecal reservoir and *Adhar Guda* (anal canal) is through which faeces is excreted[11]. As in modern, above the middle Houston valve of the rectum act as a reservoir of faeces, and can be correlated with *Uttar Guda* (distal rectum) and below the middle Houston, the valve helps

Table 1. Part of *Guda* with its modern correlation

S.No	Parts of *Guda*	Modern terminology
1	*Uttar Guda*	The upper part of the rectum and sigmoid colon or Distal Rectum
2	*Adhar Guda*	The lower part of the rectum and anal canal
3	*Gudoshthha*	Anal orifice

Table 2. *Guda Vali* with its modern correlation

S.No	*Guda Vali*	Situation	Modern terminology
1	*Pravahini*	Proximal	Middle Houston valve
2	*Visarjani*	Middle	Inferior Houston valve
3	*Samvarani*	Distal	Dentate line

in defecation, can be correlated with *Adhar Guda* (anal canal).

4.5 Description of *Vali*

On the lateral walls of the interior aspect of *Guda*, there are lateral folds, arranged in a spiral way like a palate of an elephant. Each *Vali* is situated at a distance of 1 and ½ *Angula* from the hair margin. *Gudoshthha* (anal orifice) is situated at a distance of half *Yava* (half-finger) in length and first *Vali* present at a distance of one *Angula* from the anal orifice. These three *Valies* are called *Pravahini, Visarjani and Samvarani*[12].

Acharya Vagbhatta considered the same description as *Acharya Sushruta* and specified that the distal-most *Vali Samvarani* is present in one *Angula* distance from *Visarjani*[13].

4.6 The Structure Involved in *Guda* Anatomy

Asthi- In *Guda Pradesh,* there are five *Asthi* which form the *Sroni* are- *Guda*, *Bhaga*, *Trika,* and two *Nitamba Asthi*[14]. Three *Sandhi* which is *Samudga* type related to *Guda*[15]. Three *Peshi* in the *Guda*[16]. And one *Seveni* present in the relation of *Guda*[17].

4.7 Vasculature of *Guda*

There are 700 *Siras* in the body which is mentioned by *Acharya Sushruta*. There are 34 *Siras* present in *Koshtha* and 8 out of 34 *Siras* of *Koshtha* supply the *Guda*, *Medhra* and *Shroni*[18].

There are 10 *Adhogami Dhamanies* which carry *Apana Vata*, *Mutra, Shukra* and *Artava* to their respective organ. Two *Dhamani* out of them carry the function of defecation[19].

4.8 *Guda* in Various Contexts

4.8.1 *Guda as Koshthhanga*

Acharya Charak considered *Guda* in terms of *Uttar Guda* and *Adhar Guda* as under 15 *Koshthhangas*[20].

4.8.2 *Guda as Marma*

Acharya Sushruta mentioned *Guda*as a *Marma* in under *Udargat Marma* and also considered in *Sadyapranahara Marma* as *Agni Mahabhuta* dominant here[21].

Acharya Vagbhatta mentioned *Guda Marma* under *Dhamani Marma*[22]. It is a one in number and if there is injury, sudden death occurs.

4.8.3 *Guda as Srotas*

Acharya Charak considered *Sthula Guda* as one of the *Moola* of *Purishvaha Srotas*[23]. *Acharya Sushruta* has used the term *Guda* as one of the roots of *Purishvaha Srotas*[24].

4.8.4 *Guda as Karmendriya*

Acharya Charak described the *Guda* as under one of *Pancha Karmendriyas* and its function is *Visarga*[25].

4.8.5 *Guda as in Muladhara Chakra*

Muladhara Chakra (inferior hypogastric plexus) presents near *Guda* and genitalia.

4.8.6 *Guda as Pranayatana*

Acharya Charak considered the *Guda* to be one of among *Dashpranayatanas*[26].

4.8.7 *Guda as Vata Sthanam*

Acharya Sushruta considered that *Vata Sthana* (location) is *Shroni* (pelvic region) and *Guda*[27].

4.8.8 *As Basti Chikitsa*

Acharya Arundutta, the commentator of *Ashtanga Hridayam* mentioned that *Basti (Niruha* and *Anuvasana)* is the best *Chikitsa* (treatment) of *Vata* which is administered in *Guda*[28].

4.9 Anatomical Relations

According to *Acharya Sushruta*, *Basti* (urinary bladder), *Basti sira* (head of bladder and fundus), *Paurush* (prostate gland), *Vrishan* (testicles) and *Guda* (ano-rectum) are interrelated and situated inside the cavity of pelvis[29].

Acharya Sushruta commanded in the context of the operation of the *Ashmari* (vesicle calculus) that the surgeon should place his finger into the *Guda* and stabilize the *Ashmari* to make a prominence in the perianal region, which denotes that *Guda* is located very closely posterior to *Basti*[30].

5. Modern Review[31]

Embryologically rectum has two developmental parts, the upper part related to the peritoneum develops from the hindgut and lies above the third transverse fold of the rectum. The lower part devoid of peritoneum develops from the cloaca and lies below the third transverse fold. The upper 15 mm of the anal canal develops from the primitive anorectal canal, and the lower part below the pectinate line (lower 15 + 8 mm) is formed from proctodaeum. Non-continuity of the two parts results imperforates anus.

Anorectum is 15 to 16 cm long and Its extension is from the recto-sigmoidal junction to the anal orifice. All over the length of the rectum is 12 cm and the anal canal is 3.8 cm. The rectum is a continuation of the sigmoid colon and ends in the anorectal ring. Whereas the anal canal extends from anorectal junction to anal orifice. The anal orifice is a part where hair, skin and conjoint longitudinal muscle are present. The rectum, in the upper part, has the same diameter of 4 cm as that of the sigmoid colon, but in the lower part, it is dilated from the rectal ampulla. The muscular layer of the rectum and anal canal is an inner circular and outer longitudinal layer. The mucus membrane of an empty rectum shows two types of folds- longitudinal and transverse. The longitudinal folds are transitory. They are present in the lower part of an empty rectum and are obliterated by distension. The transverse or horizontal folds of Houston's valves are permanent and most marked when the rectum is distended. These are superior, middle and inferior transverse or Houston's valves.

The anal canal is divided into three parts- the upper part is about 15 mm, the middle part is about 15 mm, and the lower part about 8 mm long. The upper part contains 6 to 10 anal columns, anal valves, and an anal sinus. The middle part or pecten contains a transitional zone, the white line of Hilton. Lower cutaneous part lined by true skin containing sebaceous glands, and sweat glands.

The internal anal sphincter is involuntary. It is formed by the thickened circular muscle coat of this part of the gut. It surrounds from the upper end of the canal to the white line of Hiltons. This sphincter is innervated by the autonomic nerve. The external anal sphincter is under voluntary control. It is made up of a striated muscle and is supplied by the inferior rectal nerve and the perineal branch of the 4th sacral nerve. It surrounds the whole length of the anal canal and has three parts- subcutaneous, superficial and deep.

5.1 Conjoint Longitudinal Coat

It is formed by the fusion of the puborectalis with the longitudinal muscle coat of the rectum at the anorectal

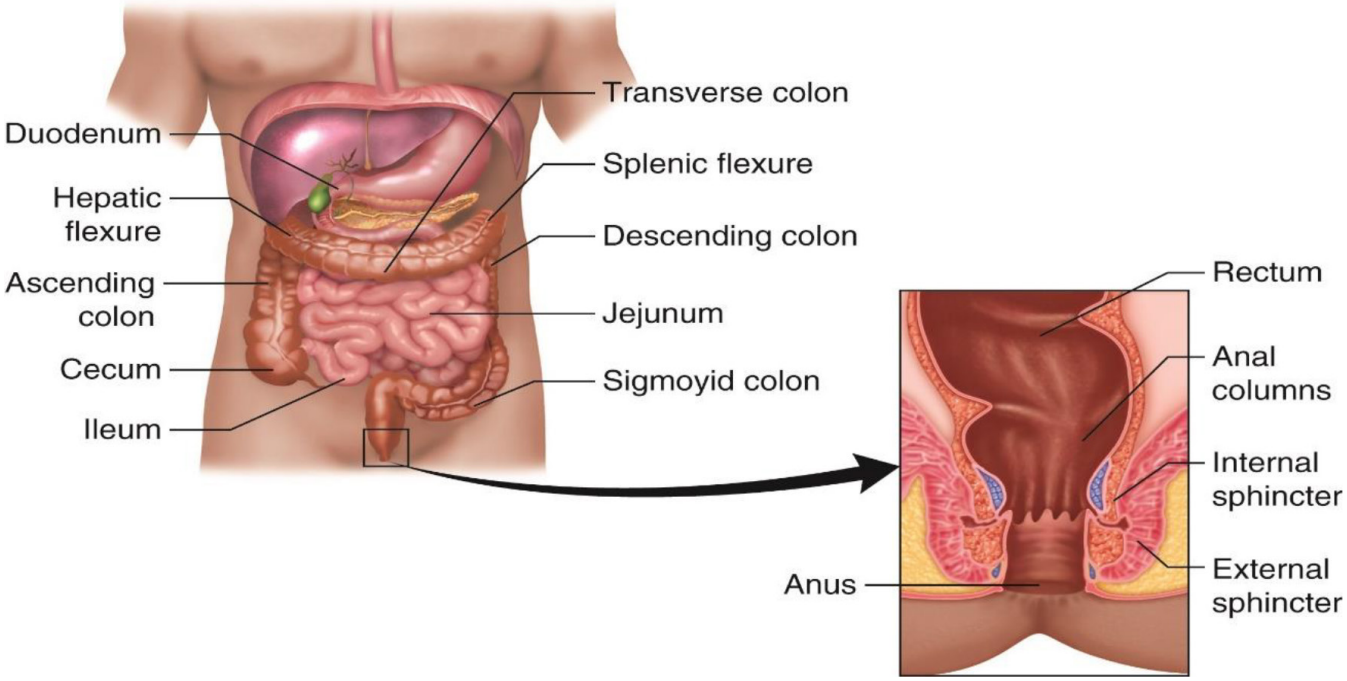


Figure 1. Rectum and anal canal.
https://anatomytool.org/sites/default/files/Unit%209%20D_M4_30.jpg

junction. It lies between the external and internal sphincters.

5.2 Anorectal Ring

This is a muscular ring present at the anorectal junction. It is formed by the fusion of the puborectalis, the uppermost fibres of the external sphincter and the internal sphincter. It is easily felt by a finger in the anal canal. The surgical division of this ring results in rectal incontinence.

5.3 Pelvic Floor Muscle

The pelvic floor or pelvic diaphragm is composed of the muscle fibre of the levator ani, the coccygeus. This muscle supports to sphincteric mechanism in the anal canal, the opening of the anal canal and strengthens the anorectal angle during defecation[31].

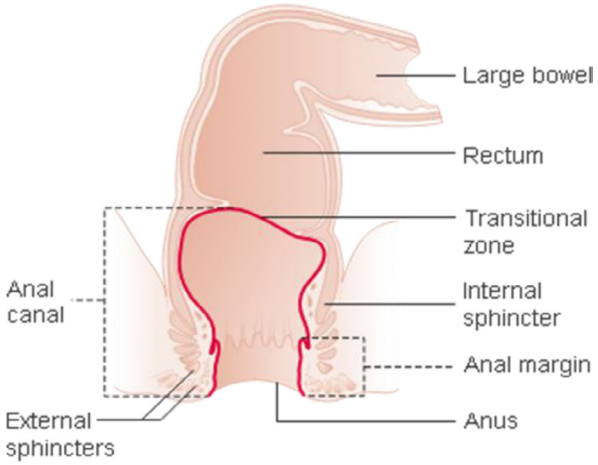


Figure 2. Anal sphincters.
https://upload.wikimedia.org/wikipedia/commons/5/52/Diagram_showing_the_anatomy_of_the_anus_CRUK_282.svg

6. Physiological Concept of *Guda*

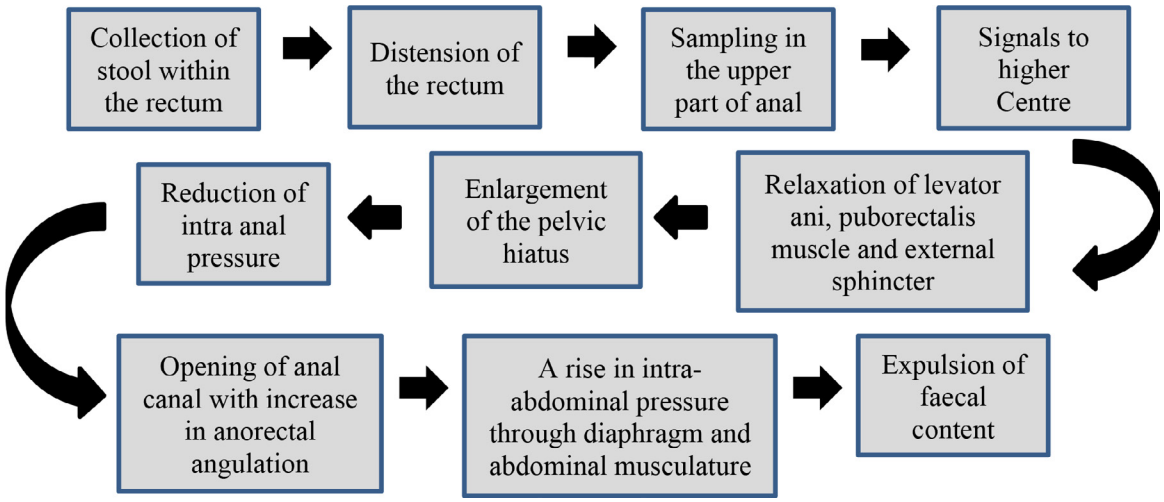
Guda is considered one of the *Pancha Karmendriyas* and its function is to excrete the faeces/ *Mala* from the body[32]. The act of defecation and maintaining continence is accomplished with the help of *Apana Vayu* and the three *Valies*. *Arundatta* and *Gannatha Sen* described that the proximal *Vali* is *Pravahini* which helps in straining and pushing the stool downwards. The *Madhyama Vali* is *Visarjani* which allows the stool to evacuate from the body and *Samvarani* which expels the stool out of the body plays voluntary control and immediately constrict the anus[33].

7. Defecation[34]

The act of defecation is preceded by a wave of peristaltic which passage down the descending and pelvic parts of the colon. The rectum becomes distended by the entry of faeces, which gives rise to the desire to defecate.

7.1 Sequential Steps in Faeces Evacuation[34]

Scheme 1



8. The Pathological Aspect of *Guda*

In the context of *Ayurvedic* literature, the term *"Guda"* denotes both the anal canal and rectum which according to Modern Medical Science is indicated by the united term of ano - rectum. The description of various diseases related to the anorectal region is found in the *Ayurvedic* texts. These are *Arsha* (Hemorrhoids), *Parikartika* (Fissure in ano), *Bhagandara* (Fistula in ano), *Gudabhramsha* (Rectal Prolapse), *Sanniruddha Guda* (Anorectal Stenosis), *Nadivrana* (Sinus), *Guda Vidradhi* (Anal abscess) etc. There are reasons behind anorectal disorders like constipation, indigestion, improper diet, stress, reduced digestive fire *(Mandaagni),* lack of exercise, faulty lifestyle, improper toilet training, spicy food, intake of excess meat etc.

9. Management

Anorectal disorders are the horrent problem of our society today. *Acharyas* mentioned that the root cause of all diseases is *"Mithya Ahara - Vihar* and *Mandaagni",* so for prevention of anorectal disorders, one should take proper diet and follow the *Dincharya*, *Ritucharya, Ratricharya,* and *Sadvritta*. Also, *Yogic* practice should be used for the management of anorectal disorders like- *Mula Bandha, Uddiyan Bandha, Markataasana, Uttanpada asana, Bhujanga asana, Sarvanga Asana* etc. *Mula Bandha* and other *Asanas* stimulate the digestion, and pelvic nerves, relieving constipation, and indigestion and strengthening pelvic floor muscles.

Basti administered through *Guda* and normalized *Apana Vayu* leading to *Vatanulomana* and improving the physiological function of *Vata*. By the use of *Basti Karma*, we can manage our hectic lifestyle and make it a healthy life[35].

10. Conclusion

This review is of strong impression that *Guda*, as described in *Sushruta Samhita*, may be correlated with anorectal region description of the modern literature while the subdivisions of the *Guda* by *Acharya Charak* viz. *Adhar Guda* can be correlated with the lower part of the rectum and anal canal and *Uttar Guda* can be correlated with the distal rectum. In *Ayurveda, Guda* is given great importance which is evident from the fact that the *Guda* is described concerning *Marma, Srotas, Koshthhanga, Karmendriya, Pranayatana, Vata Sthan, Muladhara Chakra*, and in *Basti Chikitsa*. Till date, most of the research and clinical application of *Guda* is focused on diseases of *Guda* as *Bhagandar, Arsha, Parikartika and Basti Chikitsa* while the other applied aspects of *Guda* as *Marma*, *Srotas*, as *Muladhara Chakra, Vata Sthan,* are yet to be explored. This review highlights the *Ayurveda* perspective of *Guda* and unexplored concepts related to *Guda.* There is an immense need for research in the applied aspects of *Guda* as *Marma*, *Srotas*, *Muladhara Chakra, and Vata Sthan.*

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