



## Review Article

### CRITICAL STUDY FOR ANATOMICAL DETERMINATION OF *GUDA MARMA*

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#### ABSTRACT

The terminal part of large intestine and *Moola of Pureeshavastrotas* is known as *Guda*. It is one of the *Bahirmukhstrotas* and also considered as one of the *Karmendriyan*. Charak has mentioned that *Guda* is one of the *Koshtangas*. *Guda* is defined as the passage through which excretion of faeces takes place and is located in the pelvic region and Charaka recognized two parts in it i.e., *Uttara guda* and *Adhara Guda*. It is one among nine *Bahirmukhasrotas* located in pelvic region. It is continuation of large intestines. Embryologically it is derived from *Matrujabhava*. Total length of *Guda* is  $4\frac{1}{2}$  *angula*. There are 3 sphincter situated inside the *Guda* placed one above the other at a distance of  $1\frac{1}{2}$  *angula* from each other and are named as *Pravahini*, *Visarjini* and *Samvarni*. *Pureeshdhara Kala* is related to *Guda* and it is *Moola of Pureeshvahasrotas* and also is *Sadhyopranhara Marma*. The diseases related to *Guda* are *Arsha*, *Bhagandara*, *Gudavidradhi*, *Sannirudh Guda*, *Gudabhransha*.

Objective of the study are comprehensive literary review of *Guda Sharira* with correlation of anatomical features described in Ayurveda to contemporary science. Data related to *Guda Sharira* and diseases were collected from various classics and specimen of rectum and anal canal from cadaveric study.

**KEYWORDS:** *Guda*, *Sadhyopranhara Marma*, Rectum, Anal canal.

#### INTRODUCTION

Ayurveda "the ancient medicine" cherished by the sages, protected and diversified by the modern Ayurvedic scholars has proved to be a boon for the society and for people around the globe. It is the science of life. The basic aim of Ayurveda is to cure *Atura* and to maintain *Svasthya* of the *Svastha*.

In *Sharira* there are some important special *Sthana* called as the "*Sthanaveshesha*" The precaution of such *Sthana* must be taken by Chikitsaka during surgery and such *Sthana* are called as *Marma*. The study of *Marma Sharira* is an important part of Ayurvedic Sharir Rachna. The vital part of the body is called *Marma*. *Marma* is defined as the *Sthana* where *Mansa*, *Sira*, *Snayu*, *Asthi*, *Sandhi* meet together and according to Acharya Sushrut at the points of *Marma* "*Dvadasha Prana*" are situated that is why these points are called vital points.

Out of 107 *Marma Sadyopranhara*, *Marma* are of great importance because trauma to these *Marma* causes immediate death of the person. Knowledge of *Marma* allows the practitioners to influence the flow of *Prana* through both the gross and subtle bodies for the purpose of restoring health and peace of mind. *Guda Marma* is *Sadhyopranhara Marma* according to Rachana Sharir. Its main role is defecation.

Discussion of anatomical details of organ includes location, blood and nerve supply, anatomical relationship, function and *Doshic* relationship. All these details are scattered throughout the classical text.

Keeping in view of ancient Acharyas it becomes important to understand the complete Anatomy of the *Guda* which may be interpreted to come out with higher and more scientific knowledge which will be very helpful and more practically useful to our medical fraternity in modern era. Therefore in order to highlight the comprehensive or to get sound knowledge of the cardinal components, the study of *Guda Marma* along with diseases has been undertaken. The intended work may prove helpful for clinical faculties and academicians.

The detailed description of *Guda* is not clearly mentioned in Ayurvedic text so the main aims and objective of the study would be to correlate *Guda Marma* with modern science, critical study of *Gudasharira*, comprehensive and correlative study of disease of *Guda* and anal canal.

**Definition**

*Guda* is defined as the passage through which excretion of faeces and flatus takes place. The distal part of large intestine (*Antra*) which is four and half fingers in length is called as *Guda*.<sup>[1]</sup> *Shravana* i.e., two ears, *Nayana* i.e., two eyes, *Vadana* i.e., mouth, *Ghrana* i.e., two nostrils, *Guda* and *Mendra* i.e., Urethra they are considered as *Bahyasrotas* which opens on the surface of our body.<sup>[2]</sup>

From above explanation we can consider *Guda* as a tubular structure which opens on the surface of body i.e., on the perineal region. It is formed to carry a specific function so for that reason it is also considered one among the *Karmendriya*.<sup>[3]</sup> *Visarga* i.e., evacuation or excretion of *Purisha* is considered as its specific function.

**Formation of Guda**

It is formed by the best (Prasad Bhag) of blood and *Kapha*, after being digested by *Pitta* with the help of *Vayu*.<sup>[4]</sup>

Acharya Charak has mentioned about two parts of *Guda*:<sup>[5]</sup>

1. *Uttar Guda*
2. *Adhara Guda*

So it is clear that in Samhita Granthas there is limited information about *Guda Marma* and its Rachna Sharira that *Guda* is divided into *Uttara Guda* and *Adhara Guda* but does not classify the exact position of *Guda Marma*. It is explained according to physiological activity.

**Synonym of Guda<sup>6</sup>**

- 1) *Apanam*
- 2) *Payu*
- 3) *Guhyam*
- 4) *Gudvartma*

The lower end of the large intestines, which passes into the flexures of rectum and measures four and half fingers in length is called as *Guda*. Embryologically *Guda* is derived from *Matruja Bhava*.<sup>[6]</sup> *Guda* gets forming along with other body parts early as in the fourth month and fully formed by seventh month of gestation. Anatomical description of *Guda* includes that it is considered one among 15 *Koshtangas*.<sup>[7]</sup> In *Koshtha* it is situated in the *Shroni Pradesha*. *Guda* is situated along with the *Basti* and *Muskha* in *Shroni Pradesha*. They are interrelated with each other.

Acharya Vagbhata has also included *Guda* in *Dashpranayatana*. *Guda* is *Sadyopranhara marma*, *Mansa marma* and *Dhamni marma*.<sup>[8,9]</sup>

It is a part of *Purishvaha srotas* and is a *Moolsthan* of *Purishvaha srotas*.<sup>[10]</sup>

Chakrapani says that *Uttar Guda* is an organ in which *Purisha* is collected while *Adhara Guda* is meant for exertion of *Purisha*. According to Acharya Sushruta it is attached to *Sthoolantra* and is one of the organ that comes in relation with *Basti*.

**Internal Structure of Guda**

Sushrut described that interior of *Guda* contains three *Valis*. There are *Pravahini*, *Visarjini* and *Samvarni*.<sup>[11]</sup> They are situated one above the other at an interval of  $1\frac{1}{2}$  *angula*. They are arranged spirally (*Sankhavartanibha*) and resembles the colour of palate of an elephant (*Gajatalu*).<sup>[12]</sup>

S.No.	<i>Guda Valis</i>	Situation	Approximate modern term
1	<i>Pravahin</i>	Proximal	Middle Houston's valve
2	<i>Visarjini</i>	Middle	Inferior Houston's valve
3	<i>Samvarni Distal</i>	Sphincter	

Acharya Vagbhata has classified further the position of these *Valis*. He named proximal one as *Pravahini* and distal one as *Samvarni* and middle one as *Visarjini*. *Gudoshtha* (anal margin) is situated 1 *Angula* away or distal to *Samvarni*. *Pravahini* is situated most internally  $1\frac{1}{2}$  *angula* to *Visarjini* and *Visarjini* is situated  $1\frac{1}{2}$  *angula* above *Samvarni*. Each *Vali* is 1 finger in length and the distance as said between 2 *Valis* is  $\frac{1}{2}$  finger. Hence the length of *Guda* including *Gudoshtha* is  $4\frac{1}{2}$  finger.<sup>[13]</sup> The length of *Gudoshtha* is  $\frac{1}{2}$  finger.

According to Acharya Sushrut *Guda* is formed by 3 *Peshies*.<sup>[14]</sup> There are 60 *Snayu* in pelvic region and 10 in groin.<sup>[15]</sup> The pelvic region has 5 bones, Out of these 4 are found in anal region, pubic region and hip, one in sacral region.<sup>[16]</sup> Out of total 24 *Dhamanias* 10 spread downwards and go to rectum, pelvis, anus, bladder, penis etc.<sup>[17]</sup> Out of 700 *Shiras* 34 *Vata* carrying *Shiras* are in *Koshtha*, out of them 8 *Shira* are in the anus, pelvis and penis. The rest of the *Shiras* carrying *Pitta*, *Kapha* and *Rakta* are distributed similarly.<sup>[18]</sup> The *Shiras* present are called *Malvaha Siras* and *Vatvaha Siras*.<sup>[19]</sup> *Guda* is made of *Sushir Snayu* and *Samudga Sandhi*.<sup>[20]</sup> The *Dhamnis* taking a downward course carry *Apanvayu*, *Mutra*, *Purish*, *Shukra* and *Artava* to the respective organs such as *Pakvashaya* (intestines), *Kati*, *Guda*, *Basti* and *Mendra*. These organs are situated below the level of *Nabhi*. The two *Dhamnis* attached to *Sthoolantra* performs excretion of the *Purish*.

**Physiological concept of Guda**

*Guda* is described as one of the *Panchkarmendriya* and its function is to excrete the mala from the body. Acharya Charak also regards the *Guda* and *Pakvashaya* are seats of *Apanvayu*. The

*Apanvayu* helps in expulsion of *Vata*, *Mutra*, *Purish*, *Shukra* and *Garbha*. In case this *Vayu* is vitiated the disease of *Basti* and *Guda* are said to occur.

In Ayurveda the excretory mechanism is described in lucid manner. The proximal *Vali*. *Epravahini* helps in compression and pushing the stool downwards, *Visarjini*, the second *Vali* relaxes during this process and allows stool to pass down. The distal most *Vali samvarni* which expels the stool out and constricts immediately so that the continuity of stool cuts down and falls down. Thus the 3 *Valis* and *Apanvayu* are solely responsible for the mechanism of defecation.<sup>[21]</sup> *Guda* is related to *Purishdharakala*, where *Saarakittavibhajana* takes place.

According to Ashtang Sangrah *Guda* is considered as *Mahamarma*.

### Dimension of Guda Marma

Its dimension is equal to palm of the particular person. According to Acharya Sushruta it is *Mushthi Praman*.<sup>[22]</sup> Some terms are related to *Guda* like:-

- 1) ***Gudopastha Pradesha*** – Meaning Perineum region related to manifestation of pain in *Tuni*, *Pratituni*.
- 2) ***Guda Parshava Kshetra***- Meaning ischio rectal fossa where *Bhagandara pidikas* occur.
- 3) ***Guda Mandala*** – circular area of anus.
- 4) ***Gudashraya Roga*** – Disease which takes origin or manifest in *Guda* like *Arsha*, *Bhagandara*.
- 5) ***Gudankura*** – Bud like structure in *Guda* (*Arsha*)
- 6) ***Guda Alaya*** – *Alaya* means seat and *Guda* in the seat of *Apana Vayu*.
- 7) ***Gudosta*** – Anal verge.

In the Nidana Sthana of Sushruta, it has been told that *Basti*, *Bastisira*, *Paureesha*, *Granthi*, *Vrishana* and *Guda* are related to one another and are present in *Gudasthivivara*.<sup>[23]</sup>

While explaining importance of *Guda* Charaka tells, the given *Taila* through *Guda* pervades through *Shira*, *Dhamni* and reaches to the different parts of *Srotasas*. Just like water poured at the *Moola* of tree, by this concept it is explained that *Guda* is *Moola* of *Sharira* whatever *Dravya* is given through the *Guda* it reaches to all over the body.<sup>[24]</sup>

### Material and Method

References and data about *Gudamarma* is collected from various Ayurvedic text and modern text. From Brihatrayis and Laghutrayis and other classical books including journal and articles, scientific papers and the previous work done in related topic along with details of modern science on the subject was reviewed and relevant information was collected. They were analysed scientifically and discussed emphatically.

Books from our library and from the Uttaranchal Ayurvedic College were used in collection of data. Relevant information from related websites was collected. Rectum and anal canal of two cadavers were dissected and various parts were observed.

### Cadaveric study

For the cadaveric study the dead body was taken and dissected in the college of Himaliya Ayurvedic College and Hospital. It was a female cadaver. In the Samhitas the length of the *Guda* is four and half *Angul* i.e., approximately 9cm. According to modern anatomy the total length of the rectum is 12 cm and the length of the anal canal is 3 cm. So the total length of the rectum and anal canal is 15 cm in cadaveric study the following structures were found the upper two third of the rectum is related to the recto uterine pouch and the lower one third of the rectum is related to the lower part of vagina. The anal canal starts from the ano- rectal junction and ends at the anus, it is a vertical slit between two buttocks. It is situated 4cm below and in front of the tip of coccyx. The rectum begins as the continuation of sigmoid colon and ends by becoming continuous with the anal canal at the anorectal junction. In the rectum there were transverse folds of the rectum (Houston valves), Functionally rectum consists of two parts one above the middle fold and one below the middle fold. Upper part contains faces and lower part is empty. The rectal ampula was also seen.

### Literary study

In the literary review it is found that though anatomically the length of rectum and anal canal is 15cms according to modern view but according to Ayurvedic view the length of *Guda* is  $4^{1/2}$  *Angula* which is roughly 9cms so only lower 6cms of rectum and 3cms of anal canal is considered as *Guda*. As far as definition of *Marma* is concerned which says that *Marma* are the points which are vulnerable to injuries and may lead to complication, severe pain and even death due to trauma at these points. We can see that all the diseases which occur in the *Guda* region causes severe pain which is prominent symptoms of all the diseases mentioned. They can even cause death due to massive blood flow it not treated promptly as in anorectal cancers. Massive blood flow can cause vasovagal shock and death due to injury in *Gudamarma*.

### DISCUSSION

*Guda* is derived from *Matraja Bhava*, and *Matrajabhava* or *Avyavas* are *Jaliya* hence highly vascular. According to Chakrapani *Uttar Guda* is an organ where *Pureesha* is collected and *Adhara Guda* is meant for excretion of faeces. This shows rectum

and anal canal are clearly brought about in the reference of *Uttara Guda* and *Adhara guda*.

The terminal part of *Sthulantra* and *Moola* of *Pureesvahasrotas* is known as *Guda*. Acharya Charak mentioned *Moola* of *Pureeshvahasrotas* are *Sthulaguda* and *Pakvaashaya*, but Acharya Sushrut stated *Guda* and *Pakvashaya* are the *Moola* of *Pureeshvahasrotas*. *Guda* indicates the whole length of rectum and anal canal and *Pakvaashaya* may be considered as whole length of large intestines except rectum and anal canal.

Sushruta and Vagbhata have mentioned the length of *Guda* as four and half *Angula*. The measurement of one *Angula* is approximately 2 cm and on the basis of this total length of *Guda* is approximately 9 cm. It is known that average length of anal canal is 3 cm. Then the extent of *Guda* includes that of the anal canal plus lower 6 cm of rectum. Sushrut has described that the interior of the *Guda* contains three *Valis* which can be correlated to the modern anatomical parts. They can be related to horizontal folds in the rectum (Houston's valve) namely middle and the lower folds. The distance between each fold is about 2.5 cm which is approximately one and half *Angula*.

According to *Gadnathsenpravahini* can be considered as lower Houston valve, *Visarjini* to column of *Morgagni* and *Samvarni* to ano-rectal ring. According to G.D Singhal *Valis* are correlated to sphincter. In my view upper part of the rectum is considered as *Pureeshdhara/Pakwashaya/Sthoolantra* and not considered as *Guda*. The lower part of rectum is 6 cm i.e., where the desire of defecation occurs, this is the area of *Pravahini*. In the middle rectal valve there is no peritoneum, no mucous membrane but rich in stretch sensitive nerve endings. Process of defecation is stimulated here and hence can be correlated to *Pravahinivali*. On the basis of measurements given in Ayurvedic Classics *Samvarini* lies 2cm above the anal verge interiorly. This is the area of ano-rectal ring, external sphincter hence *Samvarini* can be correlated to external and internal sphincters which maintains the content. *Visargini* can be related to inferior rectal valve.

Physiologically the three types of *Valis* have three different function. During defecation the rectal muscle contracts along with chest muscle, diaphragm abdominal wall muscle, and pelvic diaphragm and exerts pressure on the digestive tract this function can be correlated to the *Pravahana karma* of *Pravahinivali*. After the parasympathetic stimulation opens the internal sphincter and voluntary relaxation opens the external sphincter, thereby faeces expelled through anus. This function can be corrected to the *Visarjan karma* of *Visarjinivali*. And at last the

passage of faeces the sphincters come to normal position that is they constrict. This can be correlated to *Aakshepana Karma* of *Samvarnivali*.

According to Acharya Charaka, the *Guda* is divided into 2 parts, one upper part where *Pureesha* is collected known as *Uttara Guda*, other lower part where *Pureesha* is expelled out is known as *Adhara Guda*. The rectum has two functional parts, the upper part related to peritoneum develops from hind gut and lies above the middle fold of rectum and it acts as the reservoir of the fecal matter. The lower part devoid of peritoneum develops from the cloaca and lies below the middle fold. It is usually empty in normal individuals. Being sensitive its distension causes desire to defecate. Hence *Uttarguda* can be related to the part of rectum above the middle fold and *Adhara guda* to remaining part of rectum and whole anal canal where faeces is expelled out.

*Gudamarma* is *Saadyoprahara marma*. We can relate it to modern anatomy in the following ways. We know the importance of structures above and below the pectinate line portal venous system lies above the pectinate line and systemic venous system below the pectinate line. So trauma to this places can cause:-

Vasovagal shock, hypovolumic shock due to trauma at pectinate line and due to profuse bleeding hypovolumic shock occurs causes death, anal incontinence can cause anal stricture which can cause death of the person. During *Bastikarma* if *Bastinetra* is sharp it can injure *Guda* leading to vasovagal shock. If ano-rectal region gets traumatized may lead to peritonitis, internal haemorrhage, septicemia, toxemia.

Acharya Sushrut has considered *Guda* as *Mansa marma* and Acharya Vagbhata has considered it, under *Dhamni marma*. The work of both Acharyas in my view is correct because if we see according to modern anatomy the very important portocaval anastomosis and systemic venous system is found in this particular place. Rectal artery, inferior rectal vein, middle rectal vein, haemorrhoidal arteries and veins, and communication between external and internal venous plexus is found here any trauma may lead to massive blood loss, which can cause death. So Acharya Vagbhata view can be justified.

In the review of *Mansa Dhatu* Acharya Charaka explained *Arshavyadhi*, which is *Mansapradoshajvyadhi* and its *Adhishthan* is *Gudavali*. In the review of *Guda* in *Bhagandaravyadhi* Sushrut explained that due to apathy *Sewan* in the area around anal region red colored *Pidika* are formed due to *Rakta* and *Mansadushti* which is called *Bhagandara*. He also mentioned *Mansankur* like structure called *Arsha* to develop in *Guda pradasha*.

Both the diseases are *Mansapradoshaj*. We also see that the fibers of the longitudinal muscle passes both inwards through the internal sphincter and also outwards between portion of external sphincter muscles, most probably accounts for the roots by which infection extends directly from the anal canal into the perianorectal tissues to form an abscess or fistula-in-ano.

The abscess takes the line of least resistance along a facial plane or other anatomical pathway may track from ischiorectal space along the fibers of the longitudinal muscle in between fasciculate of both the external and internal sphincter muscle to burst into the anal canal. It is not uncommon to find an abscess or fistula extending upwards between the external and internal sphincter muscle. This extension must occur along the main portion of the longitudinal muscle. Such an abscess displaces the external sphincter group outwards away from the internal sphincter and may enter the anal canal at any level by extending through the internal sphincter along a fasciculus of longitudinal muscle. The multiple extension of the longitudinal muscle through the external sphincter may also explain the not uncommon occurrence of more than one internal opening. Thus we see that the diseases of *anal canal* are occurring mainly in musculature so by this point, view of Acharya Sushruts explanation of *Guda* being a *Mansa marma* can be justified

#### CONCLUSION

- *Guda* may be correlated to Rectum and anal canal.
- *Uttara Guda* may be correlated to upper part of rectum and *Adhar Guda* to the lower part of Rectum and anal canal.
- 3 types of *Valis* may be correlated to the horizontal folds of the rectum and anal sphincter.
- The length of the *Guda* includes lower 6cms of *rectum* including middle and inferior rectal folds (valve) and 3cms of anal canal.
- *Gudaushta* may be correlated to Anus.
- The total length of *Guda* is  $4^{1/2}$  *angula* which includes 3 cm of anal canal and 6 cm of rectum.
- *Gudamarma* is both *Dhamni* and *Mansa marma*.
- *Guda* is a *Sadyopranhara marma*.
- Physiologically *Samvarni* and *Visarjini* can be correlated to external and internal sphincter.
- *Guda* is one among 15 *Koshtangas*.
- *Guda* is an important seat of *Prana* therefore included in *Dashpranayatanas*.

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