



Conceptual study of Dhamani Sharir in Modern Perspective: A Review Study

Gupta V^{1*}, Altaf ST², Chaudhari P³, Marwaha R⁴

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^{1*} Vrinda Gupta, First Year Post Graduate Scholar, Dept of Rachna Sharir, Pt Khushilal Sharma Govt (Auto) Ayurveda College, Bhopal, Madhya Pradesh, India.


² Sayed Tanveer Altaf, First Year Post Graduate Scholar, Dept of Rachna Sharir, Pt Khushilal Sharma Govt (Auto) Ayurveda College, Bhopal, Madhya Pradesh, India.

³ Pranali Chaudhari, First Year Post Graduate Scholar, Dept of Rachna Sharir, Pt Khushilal Sharma Govt (Auto) Ayurveda College, Bhopal, Madhya Pradesh, India.

⁴ Rita Marwaha, Professor and HOD, Dept of Rachna Sharir, Pt Khushilal Sharma Govt (Auto) Ayurveda College, Bhopal, Madhya Pradesh, India.

Ayurveda is a traditional Indian healing system that has been practiced for more than 5000 years. One of its most important anatomical terms, Dhamani, has been the subject of much debate among scholars. According to classical texts by Acharya Sushruta, Charaka and Vagbhata, Dhamani are thick-walled ducts that transport Rasa (plasma/lymph chyle) and Rakta (blood). Although they are sometimes used interchangeably with Sira (vein) and Srotas (capillary), Acharya Sushruta distinguishes them as arteries because of their pulsatile nature. Ayurveda incorporates modern anatomical structures—veins, capillaries, lymphatics, and nerves—within the terms Sira, Dhamani, and Srotas. The cardiovascular system, which is essential for maintaining life, is represented by Hridaya (heart), Sira, and Dhamani with the heart serving as the central pumping organ. According to Sushruta, ten Dhamanis extend upward, ten downward, and four laterally from the Nabhi (navel), while Acharya Charaka states they originate from the heart. The Urdhvagami Dhamanis (upward) regulate sensory and vocal functions, Adhogami Dhamanis (downward) facilitate excretion, and Tiryaggami Dhamanis (lateral) likely correspond to peripheral blood vessels. The circulatory system consists primarily of arteries, with the heart and veins making up the other major parts. Arteries are tube-like structures that carry fluid to and from all of the body's organs. For the circulatory system, this means blood, and for the lymphatic system, lymph. Arteries primarily regulate how oxygen, nutrients, and hormones are transported throughout our body. Once oxygen is loaded onto the Fe 2+ atom in the middle of hemoglobin, arteries can release new oxygen into the body. Hemoglobin binds to oxygen, which is then transported via the arteries to oxygen-deficient regions. It is then discharged to particular regions via large surface areas called capillaries due to a change in affinity for the oxygen.

Keywords: Dhamani, Artery, Sira, Srotas, Nerve, Heart

Corresponding Author	How to Cite this Article	To Browse
Vrinda Gupta, First Year Post Graduate Scholar, Dept of Rachna Sharir, Pt Khushilal Sharma Govt (Auto) Ayurveda College, Bhopal, Madhya Pradesh, India. Email: vrinda230698@gmail.com	Gupta V, Altaf ST, Chaudhari P, Marwaha R, Conceptual study of Dhamani Sharir in Modern Perspective: A Review Study. J Ayu Int Med Sci. 2025;10(6):320-326. Available From https://jaims.in/jaims/article/view/4439/	

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Introduction

Our great *Acharyas* created and discovered *Ayurveda*, a treasure trove of wisdom. We need to be knowledgeable about *Sharira* and *Ayurveda* in order to comprehend and use this knowledge correctly. The structural entities known as *Sira* and *Dhamani* are responsible for carrying the *Doshas*, which are allocated the *Kriyasamarthya* (action potential). However, the ancient *Acharya* advocated for structural scientific knowledge of life. The knowledge of *Rachana Sharira* (anatomy) is required for students of any system of medicine. Although they have been used interchangeably, they are all distinct. In general *sira* and *dhamani* means blood vessels. Because of the descriptions in the *Sushrut Samhita* about the methods for studying anatomy, cadaver dissection, *Dhamani*, *Sira*, *Srotas*, *Marma* etc., *Acharya Sushruta* is regarded as the father of surgery. He has placed a greater focus on practical knowledge. Words like "*Moola of Srotas*" "*Nabhinadi*," and others are used frequently in the *Sushrut Samhita*. The up-coursing *Dhamani* tend to preserve the body's integrity by carrying out certain bodily functions related to sound, touch, taste, smell, sneezing, laughter, speaking, etc. Flatus, urine, stool, semen, and contained food are all conveyed downward through the descending *Dhamanis*. It is important that the conveyance of *Rasa* is verified to the *Dhamanis* alone. *Dhamanis* spread *Rasa* throughout the body and fill it with air. Conversely, *Dhamanyath Anilapuranath Dhamani* discusses the related construction of arteries in technical terms, but we have to restrict the concept of palpable arteries when we include the word "*Nadi*," which is also an artery.

The *Atharvaveda* refers to *Dhamanis* which are duct with thick wall equivalent to arteries, *Siras* - which are duct with thin wall equivalent to vein and still finer ducts are referred to as *Snayu* similar to capillaries. *Acharya Charaka* starts from the root meaning of *Dhamani*. *Dhamani* is pipe like structure or tubular vessels or canal of the human body which starts from heart or from umbilicus on supported to carry *Rasa*. *Dhamani's* etymological meaning is derived from the Sanskrit verb '*Dhamyatiti*', which means 'to expand'. '*Dhamanaat Dhamanyaha*'[1] says *Acharya Charaka*, 'the one who has the distinguishing traits of pulsation is *Dhamani*'. '*Dhamanat Pooranaat Baahyena Rasaadenetyartaha*'[2]

According to *Chakrapani's* commentary. '*Dhamani* is the hollowed-out one that is filled with *Rasadi*'. It's important to understand the differences between the terms *Dhamana* and *Poorana*. As per the commentary of *Chakrapani* *Dhamani* does *Poorana* (fills) *Karma*, *Srotas* (capillaries) does the *Poshana Karma* and *Sira* (vein) does *Deshantara Gamana*[3] *Karma* (taking away from the site). According to *Vagbhata*, *Sira*, *Dhamani*, and *Srotas* are structures having lumen (*Sharirachidra*).[4] In *Naadi Parisksha Vidhi* (pulse examination), *Sharangadhara* used the term *Dhamani*, and the exact location was given, namely near the root of *Kara Angushta* (root of thumb). The *Jeevasaakshi* is the pulsatile function of these *Naadis*. [5]

There are three layers that make up the arteries in the body. The intima, the artery's first innermost layer, is composed of elastin and smooth muscle with a layer of endothelial cells embedded in it. To get to the proper perfusion site, the oxygen-rich blood must travel via a tube formed by the tunica intima. The nutrient-rich blood can get to the proper location before it releases its oxygen and other nutrients, preventing arterial leakage. The second layer is referred to as the intermediate layer or medium. More smooth muscle in this media layer has the ability to dilate or constrict, modifying the pressures experienced by the artery walls during systolic pumping. The left ventricle will exert more pressure on the walls when the muscle contracts, and the pressure will decrease as the capillaries widen. The adventitia, the outermost layer, is the final one. Vascular nerves, which regulate the smooth muscles in the arteries, depend on the adventitia to connect the arteries to other bodily tissues. In this manner, the arteries are locked in place to maintain a stable and efficient cardiovascular system rather than moving freely throughout body. In body, arteries are classified into two primary types: (1) muscular arteries and (2) elastic arteries. Muscular arteries comprise anatomically identified arteries such as femoral artery, radial artery, and brachial artery. Compared to elastic arteries, smooth muscle cells make up a larger portion of tunica media layer in muscular arteries. Compared to muscle arteries, the aorta and pulmonary arteries, which are closest to heart, have significantly more elastic tissue in their tunica media. This characteristic of elastic arteries enables them to sustain rather steady pressure gradient in spite of heart's continuous pumping action.

Materials and Methods

The literature on *Dhamani* collected from all available classical as well as modern text, the present study depends on the data collected from *Ayurvedic Samhitas* and modern books, national and international journals, previous work done, paper presented, magazines, etc. data studied, reviewed and the appropriate conclusion have been withdrawn from reviewed literature. Scholar tried to identify and understand the term used in ancient literature. This article will be help to know about *Dhamanis* from ancient science.

Development of *Dhamani*

Acharya Sushruta has used the word "*Nabhiprabhava*".[6-8] This is because in the intrauterine period the arteries and the vein start from the fetal umbilicus, thus the word *Nabhiprabhava* came into being. Sometimes the word *Nabhi* is used in the sense of heart but *Charak*, *Ashtansangraha*, *Ashtanghridaya* have shifted their view about the origin of *Dhamanis* from *Nabhi* to *Hridaya*.

- *Charak* has also mentioned in his 30th chapter of *sutrasthana* that *Dhamanis* arise from the heart.[9]
- *Sushruta* safely commented that the *Dhamanis* are vessels that originate from *Nabhi* only during fetal life, post-birth, the *Dhamanis* are directly connected to the heart. The blood vessels develop between the endoderm and the mesoderm of the yolk sac.
- According to *Ashtang Sangraha Sharira* 6/9, there are twenty-four *Dhamani*; they provide nourishment to the entire body, similar to canals carrying water supplying nourishment to a vast plot of land; the *Nabhi* is surrounded by them (*Dhamani*), just as an axle hole is surrounded by spokes (of a wheel); life is designed to dwell at that umbilicus (centre); thus, it is the seat of internal fire.[10]
- *Bhavprakash* further stated that *Dhamanis* are twenty-four in number and are descended from *Nabhi* (24), ten spread upwards, ten below, and four in various directions from among them. These capillaries feature tiny openings through which *Rasa* (nutrients) flow, very similar to the pores found in the blossom stalk of a lotus flower.

Table 1: Number of *Dhamanis* according to Acharyas

1.	Sushruta	24
2.	Charaka	10
3.	Bhavprakash	24
4.	Ashtang Hridaya	24
5.	Kashyapa	200

Discussion

Urdhvagami Dhamanis spreading upward, support (maintain) body by attending to functions such as receiving sensation of *Shabda* (sound), *Sparsha* (touch), *Rupa* (sight), *Rasa* (taste) and *Gandha* (smell); *Praswas* (inspiration), *Ucchwas* (expiration), *Jrimbha* (yawning), *Kshavathu* (sneezing), *Hasita* (laughing), *Kathita* (talking), *Ghosita* (shouting) and such other functions. These after reaching *hridaya* (heart) each one divides into three, thus becoming thirty. By these *Dhamanis* parts of body above umbilicus such as abdomen, flanks, chest, shoulders, neck, arms etc are supported and maintained.[9] *Adhogami Dhamanis* spreading downward purvey flatus, faeces, urine, semen, and menstrual blood etc. downward. These, on reaching *Pittasaya* acting upon essence of foods and drinks (known as *Rasa Dhātu*) produce by heat separates it into *Sara* (essence) and *Kitta* (waste). Purveys it throughout body and nourish body supplying nutrient materials present in essence of food, supply it to *Dhamani* spreading in upward and transverse direction, fill seat of *Rasa* (*Hridaya*) and separate urine, faeces and sweat (from *Rasa*). In between *amashaya* (stomach and small intestines) and *pakvashaya* (large intestine) each one divides into three thus becoming thirty.[10]

The *Tiryaggami Dhamani* expanded outward and split into hundreds of thousands of branches, becoming infinite. These give the impression that the entire body is *Gavaksita*, or full of windows; they are widely knit together, and their mouths, or openings, are connected to the hair follicles, or *Romakupa*. They convey *Rasa*, or chyme/nutrient tissue, both internally and externally, and *Sweda*, or sweat to the outside; through these only the potency of materials (medicines) used in the form of anointing, pouring liquids on the body and application of pastes, get cooked (processed by heat) in the skin, enter inside the body. The sensation of touch both comfortable and uncomfortable are perceived by these only.[11]

Classification of *Dhamani*

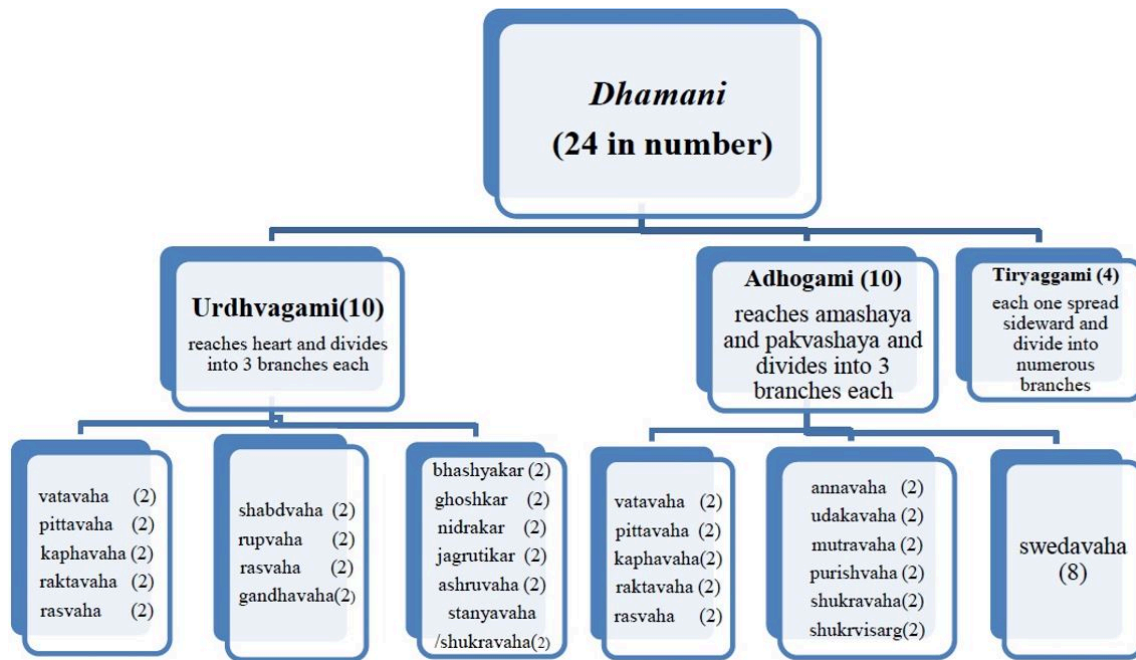


Diagram 1: Classification of *Dhamani*

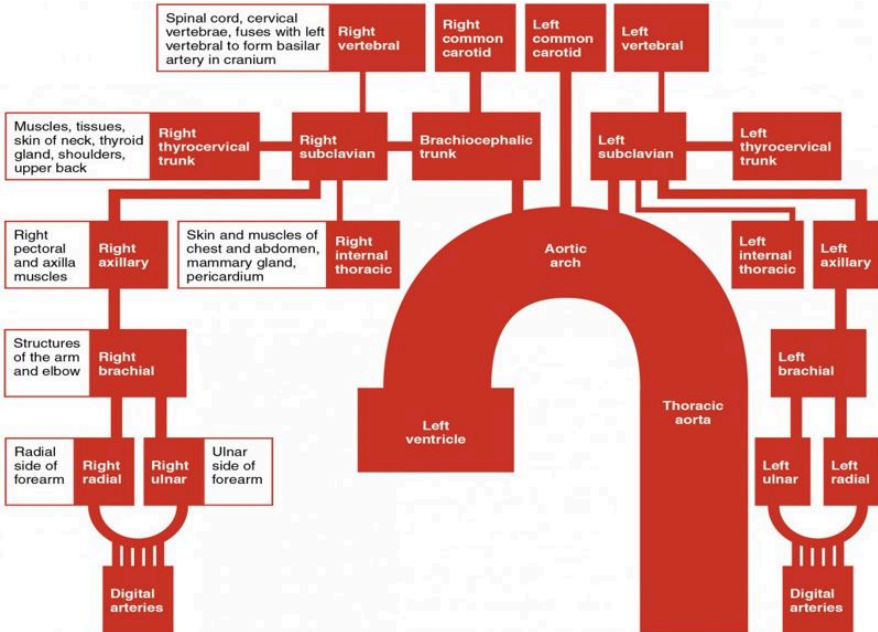
Table 2: *Urdhvagami Dhamani*

SN	Name of Dhamani	No.	Function	Nerve	Artery
1.	Vataavaha	2	Transportation of Vata	—	—
2.	Pittavaha	2	Transportation of Pitta	—	—
3.	Kaphavaha	2	Transportation of Kapha	—	—
4.	Rasavaha	2	Transportation of Rasa from heart to upper region of body	—	—
5.	Raktavaha	2	Transportation of Rakta from heart to upper region of body	—	—
6.	Shabdvaha	2	Carry sensation of Shabd (sound)	Acoustic nerve	Internal auditory artery
7.	Rupavaha	2	Carry sensation of sight	Optic nerve	Central retinal artery
8.	Rasvaha	2	Carry sensation of taste	Branches of glossopharyngeal and lingual nerve	Lingual artery
9.	Gandhvaha	2	Carry sensation of smell	Olfactory nerve	Sphenopalatine branch of internal maxillary artery
10.	Ghoshkar	2	Helps in rhythmic phonation	Inferior laryngeal nerve	Laryngeal arteries
11.	Bhashyakar	2	Helps in speech	Hypoglossal nerve	Sublingual artery
12.	Nidrakar	2	Helps in sleeping	—	—
13.	Jagrutikar	2	Helps in keeping awake	—	—
14.	Ashruvahi	2	Carry and flow of tears	Lacrimal nerve	Lacrimal artery
15.	Stanyavahi /shukravahi	2	Carry milk in breasts in females /carry semen(internally) from breasts in males	Mammary nerve	Mammary artery

Some of modern synonymous terms which are possible for certain *Dhamani* as well as their simultaneous recognition like corresp. nerves as advocated by **Pt. Gangadhar Shastri Ji & Dr. Ghanekar** are given below:

Table 3: Correlation of *Dhamanis* with modern terms

SN	Name of Dhamani	Name A/c to Gangadhar Shastri	Name A/c to Ghanekar
1.	Shabdvaha	Auditory nerves	Internal auditory artery
2.	Rupavaha	Optic nerves	Central retinal artery
3.	Rasvaha	Glossopharyngeal and lingual nerves	Lingual artery
4.	Gandhvaha	Olfactory nerves	Sphenopalatine branch of internal maxillary artery
5.	Ghoshkar	Hypoglossal nerves	Laryngeal arteries
6.	Bhashan	Inferior laryngeal nerves	Sublingual artery
7.	Ashruvahi	Lacrimal nerve	Lacrimal artery
8.	Stanyavahi	—	Mammary artery



Adhogami Dhamani

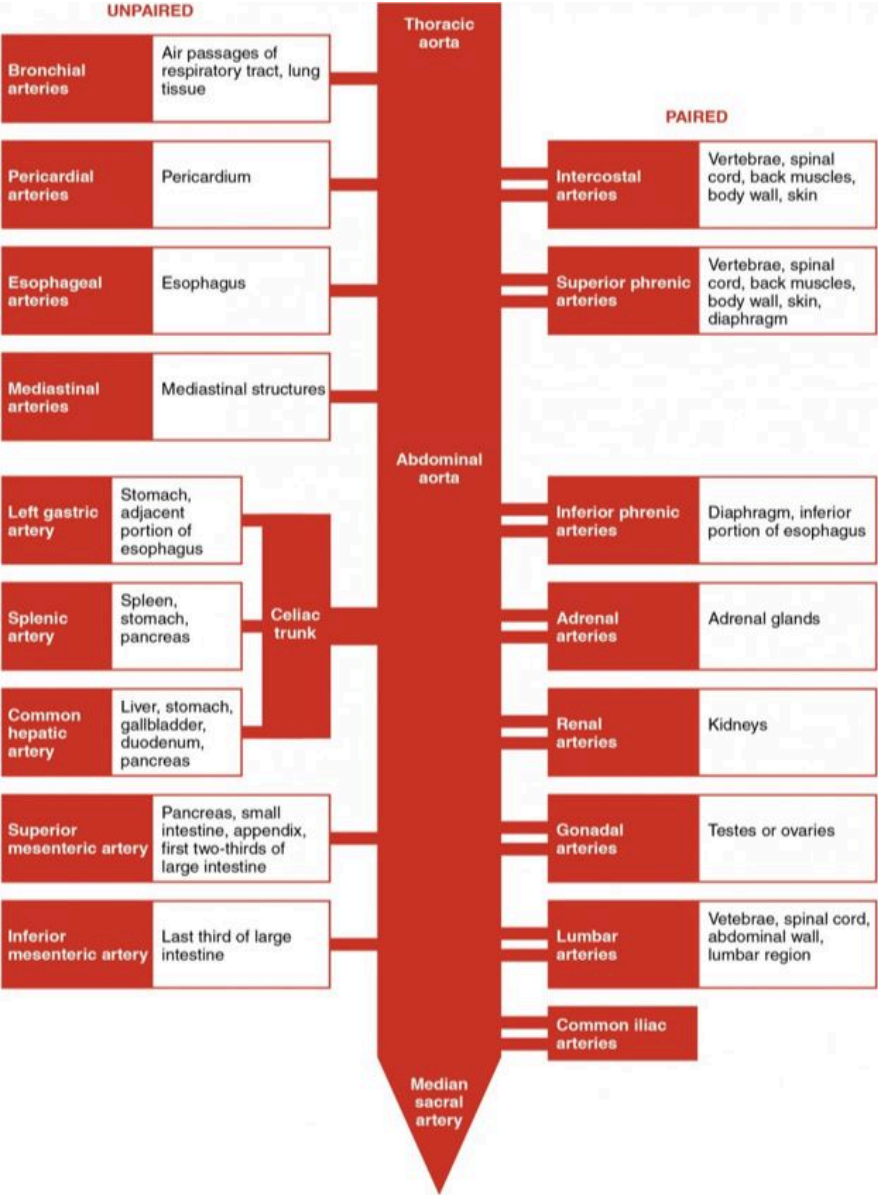


Table 4: Functions of Adhogami Dhamani

SN	Name of Dhamani	No.	Function	Nerve	Artery
1.	Vatavaha	2	Transportation of Vata	–	–
2.	Pittavaha	2	Transportation of Pitta	–	–
3.	Kaphavaha	2	Transportation of Kapha	–	–
4.	Rasavaha	2	Transportation of Rasa from heart to target part of body	–	–
5.	Raktavaha	2	Transportation of Rakta from heart to target part of body	–	–
6.	Annavaha	2	The Dhamanis which supply to Amashaya and Shudrantra are capable to move digested food in downward direction	Vagi and sympathetic nerves	Celiac and superior mesenteric artery
7.	Udakavaha	2	Carry Udaka (water produce during digestion)	–	–
8.	Mutravaha	2	The Dhamani which supplies to the organ where urine is formed i.e. Basti (urinary bladder)	Nerves from renal plexus, spermatic, ovarian, inferior mesenteric and hypogastric plexus	Vessical arteries/Renal arteries
9.	Shukravaha /artavavaha	2	Meant for production of Sukra / Artava in the testes/ovary	Spermatic plexus/hypogastric and ovarian plexus	Testicular and spermatic artery/uterine and ovarian arteries
10.	Sukra / artava visargini	2	Meant for Sukra / Artava elimination	Nerves of male/female genital organ	Arteries of male /female genital organ
11.	Varcho-nirasini	2	To move fecal matter downward and defecate it outside the body	Pelvic visceral nerve	Inferior mesenteric and colic nerves
12.	Swedavahi	8	Purvey sweat and Rasa inside and outside the body	Cutaneous nerves	Cutaneous arteries

Tiryaggami Dhamani**Table 5: Functions of Tiryaggami Dhamani**

SN	Name	No	Function	Nerve	Artery
1.	Tiryaggami dhamanis	4	Purveys sweda and rasa both inside and outside. Carries sensation of touch both comfortable and uncomfortable	--	Cutaneous (peripheral) arteries

Conclusion

Some researchers compare *Dhamani* to nerves, while others compare it to arteries, based on their number and function in the text, despite differences in opinion over its identity and purpose. *Dhamani's* structural media for carrying nutritious components is one of their features. According to *the Dhamani*, throbbing signifies both health and the existence of life. All throughout life, the *Dhamanis* are *Panchabhutika*, which facilitate communication between the sense organ and its corresponding object. *Dhamani* being composed of *Panchmahabhuta* (five primary elements) pervade (join with) the *Panchendriyas* (five sense organs), five times (once in each sense organ): after thus uniting (joining) the *Panchendriyas* (five sense organs) these attain *Panchatva* (merge into five elements, in other words destruction) at the time of death (of the body). According to the definition that *Dhamanis* are named because they pulse, authors compare *Dhamani* to arteries. The literature research and discussion lead to the conclusion that *Dhamani* should be interpreted as an artery.

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