

# Anatomical and Physiological Perspectives of Various Srotas: A Comprehensive Review

Dr. Vimala Khatri<sup>1</sup>, Dr. Rubina Bano<sup>2</sup>, Dr. Sneha Ghawale<sup>3</sup>, Dr. Kiran<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Rachana Sharir, Government Ayurveda College, Kota

<sup>2,3,4</sup>PG Scholar, Department of Kriya Sharir, National Institute of Ayurveda, Jaipur

## Abstract:

**Background:** In Ayurveda, *Srotas* are fundamental components of the body's transport system. *Acharya* describe numerous *Srotas* that facilitate the balance of *Dosha*, *Dhatu*, and *Mala*. These channels, which can vary in size from micro to macroscopic, are crucial for a range of physiological functions.

**Aim:** To explore the anatomical and physiological aspects of *Srotas* in Ayurveda, focusing on their role in maintaining bodily balance and their impact on health and disease.

**Material & Methods:** This review synthesizes information from classical Ayurvedic texts, such as the *Charaka Samhita*, to clarify the concept of *Srotas*. It explores their structural and functional roles, including absorption, secretion, transportation, drying, excretion, and separation.

**Discussion:** The term '*Srotamsi*' includes both *Anusrotas* (individual cells) and *Sthula Srotas* (organ systems), derived from the Sanskrit root '*Stru-Strabane*,' indicating movement and filtration. *Srotas* are crucial for the flow of substances and significantly impact the state of *Dosha*, either aggravating or pacifying them. Proper functioning of *Srotas* is vital for maintaining health and restoring balance; dysfunction of *Srotas* can lead to various pathological conditions.

**Conclusion:** A thorough understanding of *Srotas* from anatomical and physiological perspectives is essential for appreciating their role in health and disease. This review highlights the importance of maintaining *Srotas* functionality to prevent and address health issues in line with Ayurvedic principles.

**Keywords:** Ayurveda, Dosha, Dhatu, Sharir, Srotas, Srotodushti

## Introduction

Ayurveda, as a medical science, emphasizes a comprehensive understanding of *Srotas*, which are described in ancient texts like the *Veda*, *Upanishad*, and the *Bhagavad Gita*. The four main Vedic texts—*Rigveda*, *Samaveda*, *Yajurveda*, and *Atharvaveda*—are the oldest literature in the world. In these *Vedas* various terms used to describe *Srotas*, such as *Srotoayana*, *Panthana*, *Dhamanyai*, *Sira*, *Nadi*, and *Khani*, which refers to the organs primarily composed of the *Akasha Mahabhuta* (the elemental space). For example, the term "*Hira*" stands for "*Sira*," while "*SaptakhanI*" and "*Navdvar*" refer to the external openings of the body. *SaptakhanI* includes ears, eyes, nostrils, mouth, anus, and urinary aperture, which collectively become *Navdvar*. The *Srotas* in the body are constantly flowing, akin to the origin of a waterfall.

The *Srotas* are the channels responsible for transporting substances such as blood, semen, and nutrients that undergo transformation within the human body. Therefore, *Srotas* play a crucial role in supplying essential nutrients to every part of the body. For an Ayurvedic practitioner, understanding the *Srotas* is vital

for a holistic approach to patient care. Defective *Srotas* manifest as symptoms of various diseases, highlighting the importance of timely correction of these abnormalities to restore the body's normal state. Without healthy *Srotas*, the systems of the body become disturbed and are unable to perform their functions effectively.

### Origin of the Term *Srotas*:

The term "*Srotas*" originates from the Sanskrit word, derived from the roots "*Sru*" and "*Sut Gatau*." The root "*Sru*" conveys the concept of "movement," while "*Sut*" refers to an entity, specifically the vital force called "*Prana*," which is primarily responsible for motion within a living body. Thus, "*Srotas*" signifies the bodily channels that house and facilitate the movement of these vital entities.

### Definition of *Srotas*:

- *Srotas* are structural components that play a key role in the formation, transformation, and transportation of nutrients within the body.
- They act as pathways that direct the substances they carry, guiding them to their specific destinations.
- *Srotas* possess unique properties, allowing them to exude, ooze, filter, and permeate various bodily fluids.

### Synonyms of *Srotas*

*Acharya Charaka* has provided various terms to describe the different types of hollow structures in the human body, such as:<sup>1</sup>

1. *Srotamsi*: These structures accommodate the free flow of *Prana*, *Anna*, *Udaka*, and more within the living body.
2. *Sira*: They enable the smooth movement of *Vata*, *Pitta*, *Kapha*, and others.
3. *Dhamani*: These structures have the capability to pulsate.
4. *Rasavahini* and *Rasayini*: These terms refer to vascular structures that transport *Rasa* within them.
5. *Nadi*: The term is derived from the root "*Nad*," which means "flow."
6. *Pantha* and *Panthana*: These words signify a passage or pathway.
7. *Marga*: It has a similar meaning to *Pantha*, denoting a path or route.
8. *Sharira chidra*: This term refers to body orifices and openings.
9. *Samsritasamsritani*: These are ducts with or without constrictions
10. *Adhaya*: It implies a resting place, storage for various elements, propensities, accumulations, permeation, traces, or a repository.
11. *Niketa*: This word signifies a residing place.

### *Srotas Aakrati*<sup>2</sup>

**Color:** According to *Acharya Charaka*, the *Srotas* have a colour that resembles the *Dhatu* they transport.

**Size:** *Srotas* can be *Anu* (microscopic) or *Sthula* (macroscopic).

**Shape:** *Srotas* may be *Vritta* (cylindrical), *Dirgha* (long), or *Pratana* (reticulated).

**Classification of Srotas**

**Table No. 1**

| <i>Acharya Charaka</i> <sup>3</sup>  | <i>Acharya Sushruta</i>  |  |
|--|--|--|
|  | <i>Bahirmukhsrotas</i> <sup>4</sup>  | <i>Antarmukha Srotas /Yogvahi Srotas - 11 pairs</i> <sup>5</sup>   |
| 1. <i>Pranavahasrotas</i><br>2. <i>Udakvahasrotas</i><br>3. <i>Annavahasrotas</i><br>4. <i>Rasavahasrotas</i><br>5. <i>Raktavahasrotas</i><br>6. <i>Manshavahasrotas</i><br>7. <i>Medovahasrotas</i><br>8. <i>Asthivahasrotas</i><br>9. <i>Majjavahasrotas</i><br>10. <i>Shukravaashrotas</i><br>11. <i>Mutravahasrotas</i><br>12. <i>Purishvahasrotas</i><br>13. <i>Swedavahasrotas</i> | 9 in male and 12 in female, they are,<br>1. <i>Netra-2</i><br>2. <i>Karana-2</i><br>3. <i>Nasika-2</i><br>4. <i>Mukha - 1</i><br>5. <i>Guda-1</i><br>6. <i>Mutramarg - 1 and 3 extra</i><br>12 in females<br>7. <i>Stanya-2</i><br>8. <i>Apatyamarg - 1.</i> | 1. <i>Pranavahasrotas</i><br>2. <i>Udakvahasrotas</i><br>3. <i>Annavahasrotas</i><br>4. <i>Rasavahasrotas</i><br>5. <i>Raktavahasrotas</i><br>6. <i>Manshavaha srotas</i><br>7. <i>Medovahasrotas</i><br>8. <i>Shukravahasrotas</i><br>9. <i>Mutravahasrotas</i><br>10. <i>Purishvahasrotas</i><br>11. <i>Aartavvahasrotas</i> |

**Table No.2**

| <i>Asthang Hridaya</i> <sup>6</sup>   | <i>Sharangdhar</i> <sup>7</sup>   | <i>Kashyap</i> <sup>8</sup>   |
|---|---|---|
| <i>Bahirmukhsrotas</i> – 9 in male and 12 in female same as <i>Maharishi Sushruta</i><br><i>Antarmukha Srotas</i> - 13 - same as <i>Acharya Charaka</i> . | <i>Bahirmukhsrotas</i> 10 in male and 13 in female.<br>Additional <i>Bahirmukhsrotas</i> in both male & female named as <i>Brahmrandh</i> . | <i>Mahat</i> – 9 In males and 12 in female same as <i>Bahirmukhsrotas</i> of <i>Sushruta</i><br><i>Sukshma Nabhi</i> and <i>Romkoop</i> |

**Mulam of Srotas**

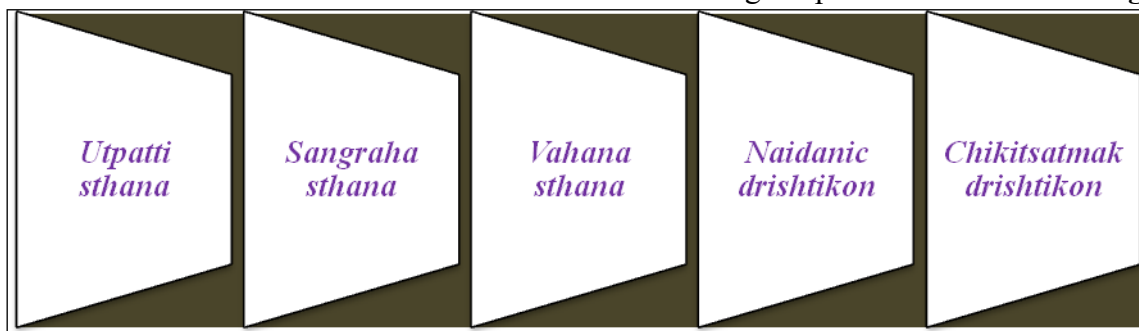
*Chakrapani* has defined *Mulam* as “*Mulamiti Prabhava Sthanam*,” which means that the *Mula* of a *Srotas* is the anatomical seat of that specific channel. It is considered the primary site where pathology occurs and where diseases manifest within the *Srotas*. The causes of *Srotamsi* dysfunction and the related diseases have also been elaborated upon, highlighting these channels as the primary sites for disease development.<sup>9</sup>

**Table No 3**

| SN | <i>Srotas</i>    | <i>Site (Mulasthan)</i>                            | <i>Sroto Dushti Lakshan</i>   |
|----|------------------|--|---|
| 1. | <i>Pranavaha</i> | <i>Hridya</i> (brain, heart)<br><i>Maha Srotas</i> | Respiratory ailments, anxiety neurosis and impending fear                 |
| 2. | <i>Udakvaha</i>  | <i>Talu, Kloma</i> (oropharynx)                    | Excessive dryness of mouth, tongue, lips and palate, and excessive thirst |
| 3. | <i>Annavaha</i>  | Stomach, left flank                                | Loss of appetite, dyspepsia, emesis and anorexia are the features         |

|     |                   |   |   |
|-----|-------------------|---|---|
| 4.  | <i>Rasavaha</i>   | <i>Hridya</i> (heart) ten<br><i>Dhamani</i> | Respiratory ailments, anxiety neurosis and impending fear, and even a death |
| 5.  | <i>Mamsvaha</i>   | Ligament, skin                              | Tumors, cysts, wasting of muscles, swelling etc.                            |
| 6.  | <i>Medovaha</i>   | Kidney, omentum                             | Edema, thirst, obesity etc.   |
| 7.  | <i>Asthivaha</i>  | Adipose tissue,<br><i>Jaghan</i>            | Excessive teeth growth, bone, tissues, hair, bones, nails deformities       |
| 8.  | <i>Majjavaha</i>  | Bones joints                                | Gets damaged by crushed, trauma, injury etc.                                |
| 9.  | <i>Sukravaha</i>  | Testes pudendum                             |   |
| 10. | <i>Mutravaha</i>  | Urinary bladder,<br><i>Vankshanas</i>       |   |
| 11. | <i>Purishvaha</i> | Large intestine,<br>rectum                  |   |
| 12. | <i>Svedavaha</i>  | Adipose tissue, hair<br>follicles           | Alternation in perspiration (To excess or less), roughness of skin etc.     |

The determination of *Moolasthan* of *Srotas* involves some logical points as described in **Figure 1**



### Aspects related to the *Moolasthan* of *Srotas*

As shown in Figure 1, *Utpatti Sthana*, *Sangraha Sthana*, *Vahana Sthana*, *Naidanic Drishtikon*, and *Chikitsatmak Drishtikon* are key perspectives related to the *Moolasthan* of *Srotas*. *Utpatti Sthana* represents the origin point of the *Srotas*, while *Sangraha Sthana* is concerned with their storage. *Vahana Sthana* is related to the conduction of *Srotas*, *Naidanic Drishtikon* is associated with the diagnostic perspective, and *Chikitsatmak Drishtikon* relates to the clinical aspect of *Srotas*.

### The *Moolasthan* of some *Srotas* as per their origin and distribution are as follows:

- Mula of Anna Vaha Srotas is Amashaya and Anna vahi Dhamanie
- Mula of Prana Vaha Srotas is Hridaya and Rasa vahi Dhamanie
- Mula of Rasa Vaha Srotas is Hridaya and Rasavahi Dhamanies
- Mula of Mamsa Vaha Srotas is Snayu and Rakta Vahidhamaniya
- Mula of Rakta Vaha Srotas is Pliha, Yakrit and Rakta Vahi Dhamanies
- Mula of Artava Vaha Srotas is *Artavavahi dhamanies* and *Garbhashaya*

### The clinical significance of *Srotas*

The significance of *Srotas* lies in their fundamental role as carriers of bodily elements and their susceptibi-

lity to disturbance. Generally, any food or activity that exacerbates the morbid tendencies of the *Dosha* or harms the body's elements can disrupt the functioning of *Srotas*. *Srotodushti*, or the morbidity of these channels, is characterized by variations in the flow of their contents, the formation of blockages, or abnormal redirection of their substances. These issues can manifest in various ways:

### Perspective on *Srotodushti* and *Srotoviddha*.

#### 1. *Atipravrutti* (Excessive Output)

*Atipravrutti* refers to an excessive flow, which can involve the overproduction or discharge of bodily fluids due to increased organ activity. Essentially, it denotes an abnormal outflow of material from the *Srotas*. Examples include:

- Excessive loose stools in conditions like *Atisar/Visuchika* (Diarrhea or cholera).
- Excessive blood loss in conditions such as disseminated intravascular coagulation (*Raktapitta*)<sup>10</sup>

#### 2. *Sanga* (Stasis/Obstruction)

*Sanga* refers to obstruction or retention, indicating a blockage in the flow of bodily fluids. Examples include:

- *Mutrasanga* -Urinary flow obstruction caused by calculi or tumors .
- *Malasanga*- Stasis of fecal material due to intestinal obstruction or gastroparesis.<sup>11</sup>

#### 3. *Siragranthi* (Obstructive Growth in Channels)

*Siragranthi* refers to the dilation of veins that obstructs normal flow through the *Srotas*, potentially leading to the formation of plaques, thrombi, or other obstructive materials within the channels. Examples include:

- Thrombus formation in blood vessels, leading to obstructed blood flow (e.g., infarction).
- Urinary calculi blocking the flow of urine.
- Gallstones impeding bile transportation.

#### 4. *Vimarga Gamana* (Retrograde Movement)

*Vimarga Gamana* refers to the abnormal flow of fluids through alternative channels due to pathology in the *Srotas*, resulting in a reversal of normal fluid movement. Examples include:

- Vomiting of fecal material due to intestinal obstruction.
- Regurgitation of blood in mitral stenosis, which can ultimately lead to pulmonary congestion.<sup>12</sup>

*Acharya Sushruta* did not specify general symptoms of *Srotodushti* (disorders of the channels) or *Srotoviddha* (blockage in the channels). However, regarding the causes of *Srotodushti*, both *Vridhdh* and *Laghu Acharya Vagbhata* agree with *Acharya Charaka*.

In the *Astang Samgrah*, *Acharya Vagbhata* describes that if the *Srotas* are obstructed, symptoms may include *Bhram* (dizziness), *Moha* (delusion), *Kampa* (tremors), *Pralaapa* (delirium), *Aadhman* (flatulence), *Shool* (pain), *Aruchi* (loss of appetite), *Trit* (thirst), *Chhardi* (vomiting), *Jwar* (fever), *Raktasuti* (severe bleeding), *Mutrapurisasrodha* (suppression of urine and feces), and *Maran* (death).

Furthermore, *Acharya Vagbhata* outlines the *Vidhha Lakshan* (signs of obstruction) for specific *Srotas*. For *Pranvaha Srotas*, these include *Atishrast* or *Pratibaddha* (excessive or obstructed flow), *Kupita* (irritability), *Alpa Shasabda* (reduced sound), and *Shoola* (pain). For *Udakavaha Srotas*, the signs are *Atitrishna* (excessive thirst), *Mukha Shosh* (dryness of the mouth), *Karnaswedanam* (ear sweating), *Tamohdarshan* (vision problems), and for *Annavaha Srotas*, according to the *Matrasheetiya Adhayaya* (rules of food intake), if dietary guidelines are not followed, the *Srotas* can be damaged. *Acharya Vagbhata* interprets that abnormalities due to unhealthy foods and activities can be identified through symptoms related to the *Vridhdhi* (increase) or *Kshaya* (depletion) of *Dhatu* and *Mala*.



### Concept of *Srotovaigunya*

*Srotas* facilitate the transfer of materials from one part of the body to another. Nutrient substances that nourish the *Dhatu* are processed by the *Ushma (Agni)* present in the *Dhatu*. This process of *Agnivyapara* and *Paka* occurs within the *Dhatuvaha Srotas*.

### Importance of *Srotas*

*Acharya Charaka* explains that *Vata*, *Pitta*, and *Kapha* circulate throughout the body via the *Srotas*. When these channels function normally, the body remains disease-free. However, any disruption in the *Srotas* can lead to abnormalities in the *Dhatu*, resulting in illness.

*Acharya Charaka* further notes that when the *Srotas* become morbid, the *Sharir Dhatu* within these channels can become exaggerated. Similarly, abnormalities in one *Srotas* can impact other *Srotas* and their contents. The *Dhatu* in the body are metabolized by their respective *Dhatvagni*, and the *Poshya Dhatus* are nourished through their corresponding *Srotas* from the *Poshaka Dhatu*.

In the 28th chapter of *Sutra Sthana*, *Acharya Charaka* describes how both *Prasad* (pure substances) and *Mala* (waste products) enter and circulate through the *Srotas*. These channels transport essential nutrients to various *Dhatu* in the required quantities.

*Acharya Vagbhata* follows *Acharya Charaka's* explanation in the *Ashtang Samgrah*, stating in the 6th chapter of *Sharir Sthana* that when these *Avkaash* (empty spaces) become abnormal, it leads to abnormalities in the *Dhatu*. This, in turn, causes *Srotas* to affect one another and the *Dhatu* to influence each other, resulting in overall imbalances, primarily due to abnormal *Dosha*.

In the *Ashtang Hridaya*, *Acharya Vagbhata* explains that when *Srotas* are vitiated due to unsuitable food, activities, or lifestyle, they can lead to disease. Conversely, when *Srotas* remain normal, the individual remains healthy.

### Discussion

According to the structure of the *Srotas*, they are empty passages originating from a root location and extending throughout the body to serve as a transportation system for the nutritional needs. The *Raktavaha Srotas*, for instance, can be compared to the hematopoietic system. The liver and spleen, originating from this system, act as reservoirs for blood, similar to the circulatory system. Additionally, damaged red blood cells are removed from circulation and destroyed by phagocytic macrophages in the spleen and liver, with the remaining components being recycled. The liver and spleen play a crucial role in the life cycle of red blood cells, including their destruction and the recycling of their components. Conditions such as congenital biliary atresia and biliary cysts represent anatomical changes in the liver.

*Srotas* play a crucial role in producing healthy tissue, promoting longevity, enhancing immunity, providing strength, and regulating digestion. Malfunction of the *Srotas* can lead to various pathological conditions, including hypertension, obstruction (*Sanga*), and issues with the cerebral glands, as well as clinical manifestations of *Vimarga Gamana*. Disorders related to *Srotas* can include dehydration, electrolyte imbalances, improper respiration, gonorrhoea, dyspepsia, biliousness, leprosy, constipation, *Ama*, and infertility. These pathological conditions can be managed effectively by treating and balancing the *Srotas*.<sup>13</sup>

## Conclusion

*Srotas* are essential for the transformation of one body tissue (*Dhatu*) into the next. Diseases often arise from malfunctioning *Srotas*, which disrupt the interaction between *Dosha* and body tissues. Ayurvedic texts underscore the importance of *Srotas* in disease manifestation, highlighting their role in sustaining normal physiological functions and overall health. To prevent issues related to *Srotas*, it is crucial to avoid factors that can cause their dysfunction. Thus, "prevention is better than cure," and practicing *Nidana Parivarjana*—avoiding causative factors—is vital for maintaining good health and homeostasis.

## Reference

1. Bradhhajeevaktanra Hindi Viddhotani Tika, Pandit HemrajSharma Varanasi Chaukhambha Sanskrit Sansthan Edition 2009.
2. Shastri Kashi Nath, Vidyotini Commentary on Charka Samhita, Varanashi: Chaukhamba Bharti Academy, 2018. Ch. viman 5/23 page -14
3. Charak Samhita Vidyotinitika, Shastri K, Chaturvedi G, 1st edition. Varanasi: Chaukhambha Bharati Academy; 2008. Vol.i, ch. Viman 5/6 Page no.710.
4. Sushruta Samhita Ayurveda Tattva Sandipika, Shastri Ambikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. sha.5/6 Page no.97.
5. Sushruta Samhita Ayurveda Tattva Sandipika, Shastri Ambikadutta, 1st edition. Varanasi Chaukhambha Sanskrit Sansthan; 2014. Vol. i, Su. sha. 9/12 Page no.55.
6. Astanga Hridayam Vidyotinitika, Kaviraja Gupta Atrideva, 1st edition. Varanasi: Chaukhambha Prakashan; 2016. Vol. i, Asthang hridaya sharir 3/40-41, Page no.254.
7. Sharangdhar Samita Jeevan Prada Hindi Tika, Chaukhambha Orientalia Edition 2017 Purvkhnad 5/44 page n. 42.
8. Bradhhajeevaktanra Hindi Viddhotani Tika, Pandit HemrajSharma Varanasi Chaukhambha Sanskrit Sansthan Edition 2009.
9. Astang hrdayam. By atri dev, EDITED BY Yadunandanupadhhyaya, published by chowkhambha sanskrit series office, Varanasi, 1959, 188.
10. Murthy Shrikant KR, Susruta Samhita, Sharirsankhyavyakarana, 5<sup>th</sup> Chapter, Sharirsthan, English translation, Chowkhambha orientalia, Varanasi
11. Sushrut Samhita Sharirsthan. Ayurvedic Rahasyadeepika hindi commentary, B.G. Ghanekar, Meharchand Lachhmandas Publications, New Delhi, 14<sup>th</sup> edition, 1999.
12. Kashinath Shastri, Gorakhnath Chaturvedi. Charak Samhita, Vidyotini Hindi commentary, Chaukhambha Bharti Academy, Varanasi, Part I, 2008,584.
13. Ambika Dutta Shastry. Susruta Samhita, Chaukamba Sanskrit Sansthan, Varanasi, 1996.