



RASAVAHA SROTAS: A COMPREHENSIVE ANATOMICAL REVIEW WITH CARDIOVASCULAR CORRELATION

Dr. Pravin K. Girhe*

PG Scholar, Department of Rachana Sharir, PDEA's College of Ayurveda & Research Centre, Nigdi, Pune*Corresponding Author

Dr. Madhuri Mahadar

Associate Professor, Department of Rachana Sharir, PDEA's College of Ayurveda & Research Centre, Nigdi, Pune

ABSTRACT

In Ayurveda, Srotas are described as important channels that help transport and regulate different substances within the body. They form a natural internal network that supports nourishment, growth and the proper functioning of all bodily systems. Among these channels, Rasavaha Srotas is considered the most essential because it carries Rasa Dhatu, the first and most vital nutrient formed after digestion. This Rasa helps in nourishing all other Dhatus, maintaining immunity, supporting growth and keeping the body healthy. Classical Ayurvedic texts mention the Hridaya (heart) and Dash Dhamanis (ten great vessels) as the root or Moola Sthana of Rasavaha Srotas. These structures play a central role in pushing and distributing Rasa throughout the body. Although Sushruta explains that Srotas are different from Sira and Dhamani, he also accepts that many Srotas have Dhamani as their root, showing a close relationship between Srotas and the vascular system. Ayurvedic scholars also describe Srotas as channels that can be small or large, similar to the modern understanding of blood vessels and capillary networks. The movement of nutrients through tiny openings, compared to Ayana in Ayurveda, resembles exchanges in the microcirculation and lymphatic system. This review compares the Ayurvedic concept of Rasavaha Srotas with the modern cardiovascular and lymphatic systems. The study highlights how both systems are responsible for circulating nutrients, maintaining fluid balance and supporting overall health. When Rasavaha Srotas or its root structures get disturbed, it can lead to improper circulation and disease. The review concludes that Rasavaha Srotas can be understood as a set of anatomical and physiological pathways similar to the heart, major vessels, plasma circulation and lymphatic flow. Recognizing these similarities helps bridge Ayurvedic knowledge with modern scientific concepts.

KEYWORDS : Ayurveda, Rasavaha Srotas, Rasa Dhatu, Hridaya, Dhamani, Cardiovascular System, Lymphatic System.

INTRODUCTION

Ayurveda presents a holistic and detailed understanding of human anatomy and physiology, in which the concept of *Srotas* forms a fundamental component. These internal channels are described as hollow pathways responsible for the transport, transformation and distribution of various bodily substances. Without the functional integrity of *Srotas*, neither the generation nor the degeneration of bodily elements can occur. The ancient *Ayurvedic* texts elaborate extensively on the anatomy and physiology of these channels and describe them as diverse as the body's structural and functional elements themselves^[1-4].

Among the various *Srotas*, *Rasavaha Srotas* are of particular importance. They carry *Rasa Dhatu*, the first and most essential *Dhatu* derived from the essence of *Ahara Rasa*. *Rasa Dhatu* serves as the foundation for the nourishment of subsequent *Dhatus*, supports systemic homeostasis and plays a vital role in immunity, growth and thermoregulation. The transportation and physiological functioning of *Rasa Dhatu* occur through *Rasavaha Srotas*. *Ayurveda* states "*Sharir Dharanata Dhataavaha*", emphasizing the crucial role of *Dhatus* in sustaining the body, with *Rasa* being the foremost.^[5]

The structural basis of *Srotas* lies in their *Srotomula* (physiological/anatomical controlling centers). "*Srotas*" refers to the channels that transport *Dosha*, *Dhatu* and *Mala*^[6] from their production sites to their sites of action. There must be a regulating point for these channels, known as *Srotomula*^[7]. *Sushruta* and *Chakrapani* provided definitions in *sutra* form, and *Chakrapani* compared *Srotomula* to the root of a tree highlighting that injury to the root leads to destruction of the entire system, just as damage to *Srotomula* affects the entire *Srotas*. Thus, *Srotomula* acts as the anatomical and physiological foundation through which dynamic equilibrium of the body is maintained.

For *Rasavaha Srotas*, *Charaka* identifies the *Hridaya* (heart) and *Dash Dhamanis* (ten great vessels) as the *Moola Sthana*, while *Sushruta* and other authorities include *Rasavahi Dhamanis* as additional components. These descriptions point toward structures that collectively resemble the major components of the modern cardiovascular system.

In modern anatomy and physiology, the cardiovascular system with the heart, major blood vessels and extensive microcirculatory networks is responsible for the circulation of plasma, nutrients and essential metabolites. Functionally, this parallels the *Ayurvedic* concept of *Rasavaha Srotas*, which ensures the nourishment and continuity of life processes through the distribution of *Rasa*.

Given the conceptual and functional similarities between *Rasavaha Srotas* and the cardiovascular system, a comprehensive comparative analysis is valuable for enhancing our understanding of human physiology from both *Ayurvedic* and modern perspectives. This article aims to bridge these viewpoints by exploring the structure, *Srotomula*, functions and clinical significance of *Rasavaha Srotas* in correlation with cardiovascular anatomy and physiology.

MATERIAL AND METHODS

Relevant references were collected from classical *Ayurvedic* literature as well as from contemporary sources including published articles, books and online resources.

LITERATURE REVIEW

Concept of *Srotas* in *Ayurveda*

In *Ayurveda*, *Srotas* are defined as the channels or pathways through which various substances move within the body. The term "*Srotas*" is derived from the Sanskrit verbal roots "*Sru*" and "*Sut Gatau*", where *Sru* denotes "movement," and *Sut* indicates the vital force *Prana*, responsible for motion within the living body. Thus, *Srotas* represent the structural networks that facilitate the movement of essential substances and life forces within the organism.^[8]

Ayurvedic texts describe *Srotas* as anatomical and physiological structures responsible for the formation, transformation and transportation of nutrients, doshas and metabolic products. They act as directional pathways with the capacity to exude, ooze, filter, permeate and distribute various bodily fluids.

Acharya Charaka identifies multiple synonyms for *Srotas* to represent their diverse forms and functions^[9]:

1. *Srotamsi* - Channels allowing the flow of *Prana*, *Anna*, *Udaka*, etc.
2. *Sira* - Structures that carry *Vata*, *Pitta*, *Kapha*.
3. *Dhamani* - Pulsatile vessels.
4. *Rasavahini* / *Rasayani* - Pathways conducting *Rasa*.
5. *Nadi* - Channels derived from the root "*Nad*" meaning "flow."
6. *Pantha* / *Panthana* - Pathways or passages.
7. *Marga* - A route or passage.
8. *Sharira Chidra* - Body orifices.
9. *Samvritasamvritani* - Ducts with or without constrictions.
10. *Aashaya* - Reservoirs or storage sites.
11. *Niketa* - Residing places.

Characteristics of *Srotas* (*Srotas Aakriti*)

According to *Ayurvedic* literature, *Srotas* possess distinct characteristics^[10]:

- **Colour:** Resembling the *Dhatu* they transport.
- **Size:** Ranging from *Anu* (microscopic) to *Sthula* (macroscopic).
- **Shape:** They may be *Vritta* (cylindrical), *Dirgha* (long) or *Pratana* (reticulated).

Ayurveda emphasizes that the body is sustained by *Dosha*, *Dhatu*, *Mala* and *Srotas* serve as the essential channels regulating their movement and distribution.

Rasavaha Srotas in Ayurvedic Literature

Definition and Importance

Rasavaha Srotas are the channels specifically responsible for the transport of *Rasa*, the nutrient-rich fluid considered analogous to plasma. *Rasa* is the first of the seven *Dhatus*, derived directly from the essence of digested food and crucial for tissue nourishment, hydration, immunity, growth and systemic homeostasis.

Rasavaha Srotas are regarded as prime channels, as the nourishment and balance of all other *Srotas* depend on the optimal functioning of this system. Proper functioning of *Rasavaha Srotas* results in *Prinan* (nourishment), vitality and physiological balance, while impairment (*Kshaya*) leads to systemic weakness, immune dysfunction and disease.

Origin and Pathway of Rasavaha Srotas

Rasavaha Srotas originate primarily from:

1) *Hridaya* (heart) and *Dash Dhamani* (Ten Dhamanis) - as described by *Charaka*

2) *Hridaya* and *Rasavahini Dhamanis* - as described by *Sushruta*

These channels distribute *Rasa* from the gastrointestinal tract to the heart and subsequently throughout the body, creating a wide-reaching vascular-lymphatic network.^[11]

Classical commentators explain the significance of the *Srotomula* (root). *Chakrapani* compares the *Srotomula* to the root of a tree, emphasizing that injury to it compromises the entire system.

Functional Role of Rasavaha Srotas

The *Rasavaha Srotas* perform multiple physiological functions:^[12]

- Transportation of nutrient-rich *Ahara Rasa*.
- Nourishment of *Rasa Dhatu* and *Rakta Dhatu*.
- Contribution to immune defense mechanisms.
- Participation in digestion and biochemical transformation of food.
- Absorption of fats and minerals through lymphatic pathways.
- Distribution of *Paushaka Dhatu* to *Sthayi Dhatu*.
- Thermoregulation and maintenance of homeostasis.

Optimal functioning manifests externally as lustrous, smooth, clear, and delicate skin, along with mental clarity, vitality, and emotional well-being.

Moola Sthana (Root) of Rasavaha Srotas

According to the classical texts:

Charaka^[13]

- *Hridaya*
- *Dash Dhamani* (Ten Dhamanis)

Sushruta^[14]

- *Hridaya*
- *Rasavahini Dhamanis*

Sushruta adds an additional *Viddha Lakshana* - *Shosha* (emaciation) - to indicate pathological involvement of these channels.

The ten *Dhamanis* described by classical scholars have been correlated by some modern authors with major cardiovascular vessels:^[15]

1. Right coronary artery
2. Left coronary artery
3. Superior vena cava
4. Inferior vena cava
5. Pulmonary trunk
6. Aorta
- 7-10. Four pulmonary veins

These vessels collectively help circulate *Rasa* (nutrient fluid) throughout the body.

From an embryological viewpoint, fetal circulation demonstrates similar principles: nutrient-rich blood returning from the placenta nourishes the fetal tissues, suggesting early development of *Rasavaha*-like pathways.

Correlation with the Heart (Hridaya)

The heart serves as the central pumping organ for the movement of *Rasa*. In modern anatomy, it is a muscular organ containing: Four chambers, valves regulating blood flow, Electrical conduction system (SA node, AV node) that generates rhythmic contractions

The cardiac cycle, consisting of systole and diastole, propels nutrient-rich fluid through the vascular network. This physiological activity strongly correlates with the *Ayurvedic* description of *Rasa circulation through Rasavahini Dhamanis*.

Ayurveda identifies *Hridaya* as the seat of *Oja*, *Chetana*, *Prana Vayu*, *Vyana Vayu*.

This highlights the centrality of the heart in both physical and subtle physiological processes.

Causes of vitiation of Rasavaha srotas^[16]

- *Guru aahara* (heavy foods)
- *Sheeta aahara* (cold foods)
- *Ati snigdha* (excessive consumption of oily/fried/greasy foods)
- *Ati maatram* (eating food in excessive quantity)
- *Ati chintanaat* (excessive thinking (stress)/worry)

Pathological Considerations of Rasavaha Srotas

Disturbances in *Rasavaha Srotas* can lead to a wide range of clinical manifestations, including:^[17]

- *Ashraddha* (lack of interest in the food)
- *Aruchi* (tastelessness)
- *Aasya vairasya* (weird tastes in the mouth)
- *Arasagnata* (inability to perceive tastes)
- *Hrullasa* (excessive salivation/nausea)
- *Gauravta* (Heaviness of the body)
- *Tandra* (Drowsiness)
- *Angamarda* (Pain in body parts)
- *Jwara* (Fever)
- *Tama* (feeling of darkness in front of eyes)
- *Pandutva* (Anemia)
- *Srotorodha* (obstruction in the channels of transportation in the body)
- *Klaibya* (impotence)
- *Saada* (fatigue/stoppage of working of organs and tissues)
- *Krushangataa* (emaciation of body parts)
- *Nasho agnehe* (destruction of digestive fire - capacity to digest food, sluggish digestion)
- *Vali* (premature wrinkling of skin)
- *Palita* (premature graying of hairs)

These symptoms arise from impaired tissue nourishment and inadequate circulation of *Rasa*.

Modern Perspective

From a modern physiological viewpoint:

- *Rasa Dhatu* correlates with plasma and interstitial fluid.
- *Rasavaha Srotas* correspond to the combined functional pathways of digestive, circulatory and lymphatic systems.
- These channels participate in nutrient absorption, assimilation, transport and tissue hydration^[18]

The heart, blood vessels, digestive glands (liver, pancreas), stomach and intestines collectively form an integrated network that mirrors the *Ayurvedic* concept of *Rasavaha Srotas*.

DISCUSSION

In *Ayurveda*, the concept of *Srotas* represents a complex network of channels that originate from specific anatomical or physiological root locations (*Srotomula*) and extend throughout the body to facilitate the movement, transformation and distribution of essential substances. These channels form the basis for tissue nourishment, metabolic balance, and systemic homeostasis. The physiological integrity of *Srotas* ensures the proper formation of *Dhatus*, maintenance of

immunity, enhancement of vitality and regulation of digestion and metabolism.

When interpreted through a modern anatomical lens, *Srotas* demonstrate functional parallels with various bodily systems. For example, the *Raktavaha Srotas* responsible for the formation and transportation of blood strongly correlate with the hematopoietic and circulatory systems. The liver and spleen, which form essential components of the hematopoietic and reticuloendothelial systems, serve as reservoirs of blood and play a vital role in the breakdown and recycling of erythrocytes. Damaged red blood cells are removed by macrophages in these organs, and useful components such as iron are conserved and reused. This correlation highlights how *Ayurvedic* concepts of *Srotas* can be understood in alignment with modern physiology.

Similarly, the *Rasavaha Srotas* central to this article represent the pathways responsible for the creation, transport and distribution of *Rasa Dhātu*, which corresponds with plasma, interstitial fluid and the nutrient transport systems in contemporary physiology. The *Ayurvedic* description of the heart (*Hridaya*) and great vessels as the *Moola Sthana* aligns closely with the cardiovascular system, emphasizing the heart's role in distributing nutrient-rich fluid throughout the body. The inclusion of lymphatic functions within *Rasavaha Srotas* further strengthens this correlation, as the lymphatic system contributes to nutrient absorption, immune responses and interstitial fluid balance.

Disturbances in the normal functioning of *Srotas* can give rise to a wide spectrum of pathological manifestations. Classical *Ayurvedic* texts describe conditions such as *Sanga* (obstruction), *Vimarga Gamana* (misdirection of flow), and *Atipravritti* (excessive flow), each reflecting dysfunction in the channel systems. These can clinically correspond to various modern conditions such as hypertension, digestive disturbances, malabsorption, hepatic and biliary disorders and metabolic imbalances. Disorders involving dehydration, electrolyte imbalance, constipation, dyspepsia, biliary disorders and infertility have also been associated with impaired *Srotas* function.

In the context of *Rasavaha Srotas*, impairment may manifest as poor tissue nourishment, anemia, fatigue, loss of appetite, or systemic weakness. Modern physiology provides similar interpretations, where impaired plasma volume, compromised circulation or lymphatic dysfunction can lead to metabolic disorders, reduced immunity and tissue-level deficits.

Importantly, *Ayurveda* emphasizes that restoring the proper functioning of *Srotas* is a fundamental therapeutic approach. Strengthening, cleansing, or re-establishing the normal flow within *Srotas* through dietary interventions, lifestyle modifications, *Panchakarma* therapies, and *Rasayana* can correct underlying pathological processes and improve systemic health.

Thus, the discussion of *Srotas*, particularly *Rasavaha Srotas*, demonstrates a remarkable conceptual bridge between ancient *Ayurvedic* thought and modern biomedical understanding. Both perspectives highlight the essential roles of nutrient transport, fluid balance, circulatory integrity and organ coordination in sustaining life. Integrating these viewpoints can contribute to a more comprehensive understanding of human physiology and support the development of holistic therapeutic strategies.

CONCLUSION

Rasavaha Srotas form a fundamental channel system responsible for the transport of *Rasa*, the primary nutritive fluid essential for sustaining all *Dhatus*. Their structural and functional characteristics show close correlation with the cardiovascular system particularly the heart, major vessels, and capillary networks highlighting the anatomical relevance of classical *Ayurvedic* descriptions. Proper functioning of *Rasavaha Srotas* ensures effective tissue nourishment, physiological balance and immune strength, while their dysfunction may lead to significant systemic disorders. Maintaining these channels through appropriate lifestyle practices and avoiding causative factors (*Nidana Parivarjana*) remains essential for preserving health and homeostasis.

REFERENCES

- Sharma PV, editor & translator. Charaka Samhita. Vol. I. 1st ed. Varanasi: Chaukhamba Orientalia; 1981. Vimanasthana 5/10, p.331.
- Srikantha Murthy KR, editor & translator. Ashtanga Hridayam. Vol. I. 9th ed. Varanasi:

- Chaukhamba Krishnadas Academy; 2013. Sutrasthana 11/17, p.157.
- Sharma PV, editor & translator. Charaka Samhita. Vol. I. Reprint ed. Varanasi: Chaukhamba Orientalia; 2008. Vimanasthana 2/9.
- Chakrapanidatta. Charaka Samhita of Agnivesha, elaborated by Charaka and Dridhabala. Edited by Trikamji Acharya. Reedition. Varanasi: Chaukhamba Sanskrit Pratishthan; 2000. Sutrasthana 28, p.175.
- Sharma S, Kumar K, Tiwari N. Rasavaha Srotas: An Anatomical Exploration and Its Correlation with Cardiovascular Physiology. AYURLINE Int J Res Indian Med. 2025;9(5):1-7.
- Shastri AD, editor. Sushruta Samhita. Vol. 1. Reprint ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2012. Sutrasthana 15/3, p.73.
- Agnivesha. Charaka Samhita. Edited by Acharya YT. Reprint ed. Varanasi: Chaukhamba Surbharati Prakashana; 2011. Sharirasthana 7/16, p.339.
- Khatri V, Bano R, Ghawale S, Dr. Kiran. Anatomical and Physiological Perspectives of Various Srotas: A Comprehensive Review. Int. J. Multidiscip. Res. 2024;6(5):1-7.
- Agnivesha. Charaka Samhita, Vimanasthana, Chapter 5, verse 8. Edited with Vaidyananorama Hindi commentary by Acharya Vidyadhar Shukla & Prof. Ravi Dutt Tripathi. Delhi: Chaukhamba Sanskrit Pratishthan; 2017. p. 589.
- Agnivesha. Charaka Samhita, Vimanasthana, Chapter 5, verse 24. Edited with Vaidyananorama Hindi commentary by Acharya Vidyadhar Shukla & Prof. Ravi Dutt Tripathi. Delhi: Chaukhamba Sanskrit Pratishthan; 2017. p. 592.
- Bhadage VK, Kasar PL. Comparative Analysis of Rasavaha Srotas and the Lymphatic System in Human Anatomy. Int. J. Multidiscip. Res. 2024;11(2):356-9.
- Bhagat KR, Khanolkar G. Physiological role and anatomical consideration of Rasavaha Srotas in human body. WJPMR. 2023;9(11):270-2.
- Agnivesha. Charaka Samhita, Vimanasthana, Chapter 5, verse 7. Edited with Vaidyananorama Hindi commentary by Acharya Vidyadhar Shukla & Prof. Ravi Dutt Tripathi. Delhi: Chaukhamba Sanskrit Pratishthan; 2017. p. 588.
- Sushruta. Sushruta Samhita, Sharirasthana, Chapter 9, verse 12. Edited with Ayurveda-Tattva-Sandipika Hindi commentary by Kaviraja Ambikadutta Shastri. Varanasi: Chaukhamba Sanskrit Sansthan; 2020. p. 96.
- Yadav BP, Awasthi HH. Anatomical Consideration of Dhamani as a Moola of Srotas in Modern Prospective. International Ayurvedic Medical Journal. 2014;2(5):768-774.
- Agnivesha. Charaka Samhita, Vimanasthana, Chapter 5, verse 12. Edited with Vaidyananorama Hindi commentary by Acharya Vidyadhar Shukla & Prof. Ravi Dutt Tripathi. Delhi: Chaukhamba Sanskrit Pratishthan; 2017. p. 589.
- Agnivesha. Charaka Samhita, Sutrasthana, Chapter 28, verse 9,10. Edited with Vaidyananorama Hindi commentary by Acharya Vidyadhar Shukla & Prof. Ravi Dutt Tripathi. Delhi: Chaukhamba Sanskrit Pratishthan; 2017. p. 429.
- Dewan S. A fundamental and clinical study of "Rasvahanam srotasama hridayamoolam dashacha dhamanya" to prove the functional utility of srotomoola [dissertation]. Jodhpur: Dr. Sarvepalli Radhakrishnan Rajasthan Ayurveda University; 2014.