

An Ayurvedic Perspective of *Mutravaha Srotas* with special reference to Renal Tubules

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ABSTRACT

The concept of *Srotas* forms the cornerstone of *Ayurvedic* physiology, representing specialized channels responsible for the transport and transformation of vital substances. Among these, *Mutravaha Srotas* are of particular significance as they govern the formation, conduction, and excretion of urine. Classical texts describe their *Moola* (root structures) differently: *Acharya Charaka* mentions the *Basti* (urinary bladder) and *Vankshana* (inguinal region), whereas *Acharya Sushruta* identifies the *Basti* and *Medhra* (genital structures). Despite these variations, both emphasize the urinary bladder as the principal anatomical root. Pathological references further support this view, as derangements of *Mutravaha Srotas* are associated with urinary disorders such as *Mutrakṛcchra* (dysuria), urinary retention, and bladder distension. Notably, Dr. Ghanekar has correlated *Mutravaha Srotas* with the renal tubules of the nephron. His interpretation rests on the understanding that while the bladder serves as a storage and expulsive organ, the renal tubules are the actual channels where filtration, reabsorption, and secretion take place—functions that closely resemble the *Ayurvedic* definition of *Srotas* as conduits of transformation and transport. The primary concern of this article is to establish that identifying *Mutravaha Srotas* with renal tubules provides a logical and coherent framework. This approach reconciles the classical emphasis on macroscopic anatomical sites with the modern focus on microscopic functional correlates. Such an integrative perspective bridges *Ayurveda* and modern physiology, offering a more holistic understanding of urinary physiology and its pathological implications.

Key Words *Ayurveda, Srotas, Mutravaha Srotas, Basti, Renal tubule*

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INTRODUCTION

Etymology, the term *Srotas* (स्रोतस), derived from the root *Su-Tasi* meaning “to flow,” literally denotes a stream, current, or flow of water. It is also used for a torrent, rapid stream, or river in general, as well as a wave or water

itself. In *Ayurveda*, this term holds a special significance, being applied to the channels of nutriment in the body. Furthermore, *Srotas* are described as pathways concerned with the conveyance of essential substances and also considered in relation to the organs of sense¹. According to *Acharya Charaka*, *Srotas*

REVIEW ARTICLE

refers to the channels or pathways that facilitate the process of *Sravana* (exudation or filtration) takes place, thereby functioning as carriers for distributing the processed *Dhatu*s to different parts of the body². He described thirteen principal *Srotas* in the classical texts; however, in the *Garbha Prakaraṇa*, he further includes an additional channel termed *Artavavaha Srotas*, thereby raising the total number to fourteen³. In contrast, *Acharya Sushruta* enumerates an eleven *Srotas*, and each of these is further classified into two subdivisions, resulting in a total of twenty-two⁴. This variation in numerical description reflects the distinct perspectives of the two authoritative treatises in *Ayurveda* regarding the structural and functional organization of *Srotas*.

AIMS AND OBJECTIVES

1. To review the *Ayurvedic* concept of *Mutravaha Srotas* with reference to its *Moola*, (anatomical roots), physiological role, and pathological considerations as described in classical texts.
2. To critically analyze the differences in the descriptions of *Mutravaha Srotas* by *Acharya Charaka* and *Acharya Sushruta*, highlighting the significance of *Basti*, *Vankṣhaṇa*, and *Medhra*.
3. To evaluate the modern interpretation of *Mutravaha Srotas* with special reference to Dr. Ghanekar's correlation with renal tubules, based on functional and anatomical perspectives.

MATERIALS

1. References on *Srotas* and *Mutravaha Srotas* collected from *Charaka Saṃhita*, *Sushruta*

Saṃhita, and *Aṣṭaṅga Hṛidaya* with commentaries.

2. Views of *Ayurvedic* scholars like *Chakrapaṇi*, *Dalhana*, and modern commentators including Dr. Ghanekar studied.

3. Classical and modern views synthesized to establish correlation of *Mutravaha Srotas* with renal tubules.

LITERARY VIEW

In *Ayurveda*, the term *Srotas* (स्रोतस), derived from the root *Su-Tasi* meaning “to flow,” literally denotes a stream, current, or flow of water. It is also used for a torrent, rapid stream, or river in general, as well as a wave or water itself. Furthermore, *Srotas* are described as pathways concerned with the conveyance of essential substances and also considered in relation to the organs of sense. According to *Acharya Charaka*, *Srotas* refers to the channels or pathways that facilitate the process of *Sravana* (exudation or filtration) takes place, thereby functioning as carriers for distributing the processed *Dhatu*s to different parts of the body.

Views of Different Scholars

1. Chakrapaṇi:

“*Sravana-gati Rasadeva Poṣhyaḥ Sravanāḥ*”

The channels are those structures through which the *Rasa Dhatu* (nutritive fluid) flows and is transported for nourishment⁵.

2. Kaviraja Gangadhara:

“*Sravana-Dasatiṣṭhati Vapuṣhya Yataḥ Srotamsyu Cyante*”

REVIEW ARTICLE

The pathways by which nutritive substances flow and reach different tissues are termed *Srotas*.

3. Kaviraja Gananatha Sena:

“*Sravanam Srotamsi*”

The structures that allow the passage of nutritive substances are called *Srotas*.

Thus, from all these interpretations, it becomes clear that the routes or passages by which *Dhatu-poṣhaka Rasa* (nutrient materials) are transported are defined as *Srotas*

4. Acharya Dalhaṇa:

“*Praṇana-Vari-Rasa-Shoṇita-Mamsa-Medovahini Srotamsah*”

The channels that carry *Praṇa* (life-force), food, water, *Rasa* (plasma), *Rakta* (blood), and other bodily substances are referred to as *Srotas*⁶.

According to *Acharya Sushruta*, the *Srotas* (structural spaces) are those channels which, originating from their root openings, pervade the body and serve to transport *Rasa* and other vital fluids. These are distinct from the *Sira* (veins) and *Dhamani* (arteries), being hollow tubular passages that facilitate the conduction of fluid substances within the body.

Thus, apart from the *Sira* (major veins) and *Dhamani* (arteries), *Ayurveda* describes additional porous conduits termed *Srotas*, which are intimately connected with internal hollow structures and are responsible for the carriage of nutritive and metabolic fluids.

The distinction between *Sira*, *Dhamani* and *Srotas* is explained as follows:

1. Functional differentiation (*Karya-visheṣhata*):

Although all three participate in the transport of *Doṣha* and *Dhatu*, their specific physiological functions are described as different.

2. Scriptural authority (*Shastra-Pramaṇa*):

The *Ayurvedic* classics provide separate descriptions for each - *Sira*, *Dhamani* and *Srotas*.

3. Root enumeration (*Moola-saṁniyamata*):

The number and description of the *Moola* (root structures) of *Sira*, *Dhamani* and *Srotas* are also considered distinct in the classical texts(7).

4. Characteristic features (*Lakṣhaṇa-Bheda*):

Their distinguishing features are elaborated in *Charaka Saṁhita*

By their pulsation (*Dhmanat*), they are termed *Dhamani* (arteries).

By their function of filtration and percolation (*Stravaṇat*), they are called *Srotas* (channels).

By their function of circulation and movement (*Saraṇat*), they are termed *Sira* (veins).

Acharya Charaka, in the *Charaka Saṁhita*, described thirteen primary *Srotas* (biological channels) that represent essential pathways for physiological processes. However, within the *Garbha Prakaraṇa* (embryological discourse), he further delineates an additional channel, the *Artavavaha Srotas*, thereby expanding the total number to fourteen. From a pragmatic and clinical perspective, these channels are described on the basis of their *Moola* (anatomical origin) physiological role, and pathological manifestations (*Prakopa Lakṣhaṇa*).

In contrast, *Acharya Sushruta*, in the *Sushruta Saṁhita*, enumerates eleven *Srotas*. Each of these
January 10th 2025 Volume 24, Issue 1 Page 87

REVIEW ARTICLE

is described bilaterally, thus constituting a total of twenty-two channels. This dual framework presented by *Acharya Charaka and Acharya Sushruta* not only reflects differences in numerical enumeration but also highlights the evolving conceptual understanding of internal transport and metabolic systems in classical *Ayurvedic* physiology.

DISCUSSION

Mutravaha Srotas in Classical and Modern Perspectives

In *Ayurveda*, the term *Mutravaha Srotas* refers to the structural and functional pathways responsible for the formation, transportation, and excretion of urine.

According to *Acharya Sushruta*, there are two *Mutravaha Srotas*, with their *Moola* (root structures) situated in the *Basti* (urinary bladder) and *Medhra* (penile structure). In contrast, *Acharya Charaka* identifies the *Basti* (urinary bladder) and *Vankshana* (inguinal region) as the root sites of these channels⁸. On comparative analysis, it is evident that both *Acharyas* attribute the origin of *Mutravaha Srotas* to the urinary bladder as the principal organ, while a difference exists in the secondary structure mentioned, *Acharya Sushruta* highlights the role of the *Medhra* (genital organ) whereas *Acharya Charaka* emphasizes the *Vankshana* (inguinal region). This apparent divergence, however, does not indicate a fundamental disagreement but

rather a variation in nomenclature and perspective.

Modern scholars, particularly Dr. Ghanekar (commentator of *Sushruta Samhita*) have attempted to establish a correlation between *Ayurvedic* descriptions and modern renal physiology. According to him, the *Mutravaha Srotas* can be more precisely correlated with the renal tubules of the nephron rather than the bladder alone⁹.

This interpretation is based on the following considerations:

1. Role in Urine Formation:

According to *Acharya Ghanekar*, urine is separated within the *Antra* (intestines) and subsequently transported to the *Basti* (urinary bladder) through *Sukshma Srotas* (innumerable subtle channels). The upper end of these channels is connected with the intestines, while the lower end communicates with the bladder. The liquid portion of fecal matter, separated by the *Maldhara Kala* in the intestines, undergoes further transformation into urine during its passage through these channels under the influence of *Paaka Agni* (digestive fire) and *Samana Vayu* (a subtype of *Vata*). Finally, this transformed urine reaches the bladder¹⁰. Also, *Acharya Sushruta* described that *Pakvasaya* (large intestine) has innumerable urinary channels, which continuously carry urine to the bladder just as rivers flow towards the ocean. Due to their subtlety, their openings cannot be perceived¹¹.

A similar description is found in other classics:

REVIEW ARTICLE

- The bladder is downward-facing and is constantly filled from its sides by subtle urinary channels¹².
- The water-like portion of digested food is carried through channels into the bladder, where it becomes urine¹³.

From the standpoint of modern physiology, this *Ayurvedic* view of urine formation does not correspond exactly with observed renal physiology. Hence, there is no precise English equivalent for *Mutravaha Srotas*. If interpreted in the light of modern science, *Mutravaha Srotas* may be correlated with the renal tubules (urine-producing channels within the kidneys) which play a vital role in the filtration, reabsorption, and secretion processes that ultimately form urine. Alternatively, if the association with the bladder is to be maintained, the term may be understood in the sense of kidneys together with ureters.

2. Functional Correlation:

While the *Basti* (urinary bladder) serves primarily as the site for urine collection and storage without participating in the process of urine formation⁽¹⁴⁾, the renal tubules (made up of PCT, Loop of Henle with its descending and ascending limbs and DCT) are actively engaged in the transformation, selective reabsorption of the substances from the glomerular filtrate¹⁵. This dynamic role of renal tubules in modifying and generating urine functionally correlates with the *Ayurvedic* concept of *Mutravaha Srotas* as channels responsible for transformation and transport.

3. Anatomical Consideration:

According to *Sushruta Samhita*, *Mutravaha Srotas* are two in number, and their *Moola* (root) has been described as *Basti* (urinary bladder) and *Medhra* (urethral/genital outlet). Anatomically, this indicates that the lower urinary tract is considered the prime structural basis of these channels, with the bladder serving as the reservoir for urine accumulation and the *Medhra* acting as the outlet for its expulsion. Thus, the classical description primarily emphasizes the gross anatomical structures involved in storage and elimination of urine.

In contrast, Dr. Ghanekar correlated *Mutravaha Srotas* with the renal tubules, based on their crucial role in urine formation through processes of reabsorption, and concentration of filtrate. From an anatomical standpoint, this interpretation broadens the concept of *Mutravaha Srotas* beyond the lower urinary tract to encompass the microscopic structural units of the kidney, where the actual process of urine formation takes place. Thus, while *Ayurveda* designates the bladder and urethral orifice as the structural *Moola* (root), modern scholars correlate the renal tubules as the more precise anatomical basis. Both perspectives are not contradictory but complementary-classical texts describing the macrostructural sites of storage and excretion, and modern anatomy elucidating the microstructural sites of formation.

4. Pathological Consideration

Pathologically, *Acharya Charaka* emphasizes that vitiation of these channels due to factors such as drinking water immediately after meals, January 10th 2025 Volume 24, Issue 1 Page 89

REVIEW ARTICLE

indulgence in sexual activities, and suppression of natural urges(16), results in disorders resembling *Mutrakṛcchra* (dysuria), Polyuria, Urine retention. Similarly, *Acharya Sushruta* highlights that traumatic injury to the *Mutravaha Srotas* leads to bladder distension, urinary retention, and rigidity of the penis, which again points toward bladder involvement in their pathology. These references clearly indicate that the Basti (urinary bladder) forms a crucial site of pathological manifestation. On the anatomical front, some commentators have equated the phrase *Mutravahe Dve* solely with the *Gavini* (ureters). However, this interpretation appears inadequate, since no independent disease entity is known to affect the ureters alone, either in *Ayurveda* or in modern medicine; ureteric pathology invariably coexists with renal involvement. Thus, the consideration of *Mutravahe Dve* as encompassing both kidneys and ureters provides a more holistic anatomical and pathological correlation.

CONCLUSION

The concept of *Srotas* forms a cornerstone in *Ayurvedic* physiology, representing specialized pathways responsible for the transport and transformation of vital substances within the body. Among these, the *Mutravaha Srotas* are of particular significance as they govern the formation, conduction, and excretion of urine. The classical texts of *Ayurveda* provide slightly differing descriptions of their anatomical basis—

Acharya Charaka describing their roots - *Basti* and *Vankṣhaṇa*, and *Acharya Sushruta* describing their roots - *Basti* and *Medhra*. Despite this variation, both authorities unanimously recognize the urinary bladder and its related structures as the anatomical and pathological moola of *Mutravaha Srotas*. Whereas contemporary scholarship, especially the interpretation of Dr. Ghanekar, provides a deeper correlation by aligning *Mutravaha Srotas* with the renal tubules, which are the principal sites of urine formation, filtration, and modification while *Ayurveda* emphasizes the macroscopic organs responsible for storage and excretion and modern science highlights the microscopic functional units engaged in urine production. Pathologically, both *Charaka* and *Sushruta* emphasize that derangement of *Mutravaha Srotas* results in urinary disorders such as *Mutrakṛcchra* (dysuria), urinary retention, and bladder distension, further supporting the role of the bladder as a primary site of clinical manifestation. Modern correlation with renal tubules and kidneys enriches this understanding by elucidating the functional dynamics underlying such conditions. The classical description provides the gross anatomical and pathological reference points, while modern physiology explains the microstructural and functional processes.

When viewed in this integrated manner, Ghanekar's proposition equating *Mutravaha Srotas* with the renal tubules becomes logical, as these structures represent the fundamental site of

January 10th 2025 Volume 24, Issue 1 Page 90

REVIEW ARTICLE

urine formation and closely align with the *Ayurvedic* description of urine-conducting channels.

Thus, the study of *Mutravaha Srotas* exemplifies the integrative potential of *Ayurveda* and modern medicine. It highlights how classical concepts, when reinterpreted in the light of current anatomical and physiological knowledge, can provide a more holistic understanding of urinary physiology and pathology. This convergence not only bridges ancient and modern perspectives but also opens avenues for deeper research into functional correlations between *Ayurvedic Srotas* and modern organ systems.

REVIEW ARTICLE

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REVIEW ARTICLE

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