

REVIEW OF ANATOMY AND PHYSIOLOGY OF URINARY SYSTEM W.S.R TO MUTRAVAHA SROTAS

[Shaveta Sawhney](#)¹, [Lokesh](#)²

¹Associate Professor, ²PG scholar;

Department of *Kriya Sharir*, *Patanjali Bhartiya Ayurvigyan Evam Anusandhan Sansthan*, Haridwar, Uttarakhand, India

Corresponding Author: drlucky341@gmail.com

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ABSTRACT

The living body or *Sharir* is the result of aggregation of innumerable structures called as *Srotas*. *Srotas* is a structural and functional unit of the body through which substance flow from one part to another part and body get nourishment through *Srotas*. *Acharyas* mentioned many *Srotas* like *Pranavaha*, *Udakvaha*, *Raktavaha*, *Mansvaha*, *Medovaha*, *Majjavaha*, *Shukravaha* etc. In this row *Mutravaha Srotas* is one of the most important and functional *Srotas*. In *Ayurvedic* classics *Acharya Charaka* said *Moolsthana* of *Mutravaha Srotas Basti* and *Vankshana* while *Acharya Sushruta* considered *Moolsthana* of *Mutravaha Srotas Basti* and *Medra*. *Acharya Charaka* has narrated the concept from physiological point of view whereas *Sushruta* has given more emphasis on the anatomical aspect of *Srotomoola*. *Mutravaha Srotas* is an important *Srotas* meant for the excretion of waste product from the body as urine. *Mutravaha Srotas* is initiated from *Basti* and *Vankshana*. Knowledge of *Ayurveda* in this aspect to provide the better understanding about the urinary system

Keywords: *Srotas*, *Mutravaha Srotas*, *Urinary System*, *Basti*.

INTRODUCTION

Ayurveda is a science of life developed by ancient *Ayurvedic Acharyas* about 5000 years ago with the aim to maintain the health of a healthy person and providing relief to persons suffering from one disease or the other. Detailed knowledge of normal human body i.e. *Sharira*, is considered helpful in understanding the factors influencing the health. The anatomical, physiological as well as pathological concepts about *Srotas* are broadly mentioned in *Ayurvedic Samhitas*. The living body is the resultant of aggregation of innumerable structures called as '*Srotas*'^[1]. According to various *Acharyas*, *Srotas* are the channels responsible for the nourishment of the body. *Srotas* are derivatives or modification of the *PanchaMahābhūtas* especially *Akash Mahābhūta*. Enumeration of *Srotas* is also opined by different *Acharyas* *Srotas* have their own *Moolsthanas* as the root of origin. In the context

of 13 different types of *Srotas* which are mentioned in our classics, *Mutravaha Srotas* is one among the most fundamental element of urinary tract. *Acharaya Sushrut* has mentioned two *Moolsthanas* of *Mutravaha Srotas* i.e. *Basti* (urinary bladder) and *Medra* (Urethra)^[2] while *Acharya Charaka* considered *Basti* and *Vankshana* as *Moolsthanas* of *Mutravaha Srotas*^[3]. The *Moolsthana* is the place of origin i.e. place from where a particular *Srotas* gets the nutrition and is the controlling center of that particular *Srotas*^[4]. In case of *Mutravaha Srotas* it has been said that since *Basti* and *Vankshan* are associated with *Mutra Utpatti* so they should be considered as root organs. In the context of *Malavaha Srotas* among the two *Srotomool* described by our *Acharyas*, one *Moola* serves as the controlling station and the other *Moola* carries the function of excretion.^[5]

Table 1

<i>Srotas</i>	Origin Place	Excretion Place
<i>Mutravaha Srotas</i>	<i>Basti</i>	<i>Medhra</i>
<i>Purishvaha Srotas</i>	<i>Pakvaashya</i>	<i>Guda</i>
<i>Swedvaha Srotas</i>	<i>Meda</i>	<i>Lomakupa</i>

1) *Basti* (Urinary Bladder)

The word *Basti* means 'to cover', 'base', 'store house' and 'reservoir'. This organ acts as reservoir of urine situated in the *Kati Pradesha* or below the *Nabhi*. *Acharya Sharangdhar* opines that *Basti* is situated below the *Pakvaashya*. *Basti* is one among the *Kosthangas*^[6], *Trimarmas*, and *Pranaaytana*.

Synonyms-*Malaadhar*, *Mootraashaya*, *Mootradhara*, *Mootraputa*.

Structure- *Alaaboo Aakaar* (Bottle gourd shaped) and *Dhanuvakra Aakaar*. *Acharya Sushruta* opines that *Basti* is fixed on all sides by *Sira* and *Snayu*. He further mentioned that *Basti* is *Adhomukha* i.e. its outlet is directed downwards and is connected to urethra.^[7] In some books like *Madhukosha Teeka*, the word *Basti* is used also to indicate the entire urinary tract including kidney, ureter, bladder, urethra etc.

Function-*Dhaarana* and *Poshana* of *Mutra*. The *Dhaarana* and *Poshana* of *Mootra* is regulated by the *Apaana Vata*. Hence any vitiation in the *Apaana Vata*

alters the function of *Basti* and leads to different disorders of *Basti* or *Mootravaha Srotas*.^[8]

Embryological Development – During fetal life, *Basti* is derived from the maternal contribution or *MaatrujaBhaava*.

2) *Vrikka* (Kidney)

The word *Vrikka* is derived from the root word "*Vrikkadane*" which means to take.

Location - *Vrikka* are two in number and are situated in the lumbar region on either side in the posterior abdominal wall in "*Kostha*". During fetal life *Vrikka* is derived from the maternal contribution or *MaatrujaBhaava* and is considered as the essence of "*Rakta*" and "*Meda*"^[9].

3) *Gavini* (Ureter)

Function - In *Atharavveda* it is explained that *Gavini* receives *Mutra* from the *Antras* and transport it further to the *Mutraashaya*^[10].

Gavini (Ureters) are pair of thick-walled tubes made up of smooth muscle that propel urine from the kidney

to urinary bladder. Each ureter is 10 to 12-inch-long and urine flow partly down by gravity.

4) *Mutraprasek*

Mutraprasek signifies the urethra, mainly its penile part.

Synonyms- *Mutrputak, Mutramarga, Mutrasrotas.*

Length- 2 *Angulas* in Female; 12 *Angulas* in Male.

Function - In male *Mutraprasek* performs the function of transporting both *Mutra* and *Shukra* while in female it is responsible for the transport of *Mutra* only.

5) *Mutravaha Nadi*

Location - *Acharya Sushruta* explained that *Mutravaha Nadi* is situated in between the *Amaashya, Pakvaashya* and *Basti*.

Structure - These *Nadis* have thousands of minute openings which are not visible to the naked eye.

Function - *Mutravaha Nadi* vessels arising from large intestine which fill the urinary bladder like rivers feed water to ocean on earth.

Same description is available in *Ashtang Hridaya* in the name of *MutravahaSira* as it is said that these *Nadis* are the minute channels which carry *Mutra* to *Basti*. These *Siras / Nadis* are the openings on the lateral side of *Basti* and are responsible for the filling of *Basti* with *Mutra* continuously by the process of *Nisyandan*^[11].

6) ***Vankshana-*** *Acharya Charaka* consider the *Moolsthana* of *MutravahaSrotas* as *Basti* and *Vankshana*. In present era *Basti* is more relevant to urinary bladder. While the *Vankshana* is relevant to the Lumbosacral region. *Vankshana* is also related to *Vrikka* But, in reference to *Vrikka* with *Gavini*, it is more appropriate to consider *Vankshanas* the whole urinary system.^[12]

Physiological Aspects of *MutravahaSrotas* in the Formation of Urine

First description about formation of urine is present in '*Atharvaveda*' in there it is clearly mention that *Mutra nirman* (urine formation) takes place in *Antras* (alimentary canal) and it is transferred through *Gavini* (ureters) and reaches *Basti* (bladder).^[13] In *Ayurvedic* Physiology, the phenomena of Urine Formation starts right from the process of Digestion of food, differenti-

ation of *Prasada* and *KittaBhaga*, absorption of *Prasada Bhaga*; especially absorption of liquid part from the *Pakvaashya* (Large intestine) and gets into circulation. This absorbed liquid part reaches up to Nephron of kidney by *Adhogami Dhamnis* (arteries of urinary system) *Acharya Dalhana* states that the main *Mutravaha Dhamnis* are two in number and they are further divided into enumerable branches^[14]. After filtration (*Nisyandana*) in the Nephron of the kidney the outcome (*Mutra/urine*) gets collected in the *Basti* and then passed out that urine by *Mutrapraseka*.

DISCUSSION AND CONCLUSION

In few words it can be summarized that the *Mutravaha Srotas* is one of the most important system of human body. As per *Acharya Charaka* a physician who knows anatomical and physiological details of body who has perception to predict about past , present and future of the disease is helpful to understand the factors influencing health and therefore such knowledge is widely appreciated by experts. It is impossible to treat any kind of disease effectively without the deep knowledge of *Sharir Rachana* and *Sharir Kriya* but by the time it is fade up due to lack of research and references. From the above available references, it can be understood that in the ancient *Ayurvedic* literature the concept of urinary system as an independent unit has been accepted. The detailed anatomical and physiological vision of *Ayurveda* in this regard is important without which the better understanding about the treatment part can't be developed. So that the disease of this system can be understood with more clarity and treated accordingly.

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