

PHYSIOLOGICAL STUDY OF *MUTRAVAHA SROTAS* AND STUDY THE CONCEPT OF
MUTRA NIRMAN PRAKRIYA IN *AYURVEDA*¹*Dr. Harsh Sharma, ²Prof. (Dr.) Rajesh Kumar Sharma and ³Dr. Dinesh Chandra Sharma¹M.D. Scholar, P.G. Department of *Kriya Sharir*, DSRRAU, Jodhpur.²Professor & H.O.D., P.G. Department of *Kriya Sharir*, DSRRAU, Jodhpur.³Associate Professor, P.G. Department of *Kriya Sharir*, DSRRAU, Jodhpur.

*Corresponding Author: Dr. Harsh Sharma

M.D. Scholar, P.G. Department of *Kriya Sharir*, DSRRAU, Jodhpur.

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ABSTARCT

Srotas is unique concept of *Ayurveda* related to origin, biotransformation, ailments and treatment of various body parts. The whole body constitute by *srotas*. They play a great role in the development and maintaining the equilibrium of the body. *Srotas* constitute the internal transport system of the body specially related to the fine channels of circulation and pathways carrying out all the vital functions of the body. The *mutravaha srotas* is one among the *Abhyantra srotas*. The group of the organs in the body which are associated with the *Utpatti* (formation) and *Visarjan* (excretion) of the *mutra* (urine) is termed as *Mutravaha Srotas*. It plays an important role in the excretion of the waste products of the body and thus helps in maintaining the balance among the body fluids. Urinary system is one of the most vital organ system of our body. The urinary system, also known as the renal system or urinary tract, consists of the kidneys, ureters, bladder, and the urethra. The purpose of the urinary system is to eliminate waste from the body, regulate blood volume and blood pressure, control levels of electrolytes and metabolites, and regulate blood pH. In this article focus on the physiological study of *Mutravaha Srotas*, physiology and anatomical aspects of various organs mentioned in *Ayurvedic Samhitas* related to the urinary system and also understands the *Mutranirman Prakriya* according to *Ayurveda*

KEYWORDS: *Srotas*, *Mutravaha Srotas*, *Mutra Nirman*, Urinary System, *Basti*, *Mutravaha Sira*, *Mutravaha Dhamnee*.

INTRODUCTION

Ayurveda classics have mentioned the *srotas* in various places regarding their role, structure and functions. *Srotas* is the structural and functional unit of *Shareera*. *Srotas* plays important role in maintaining the health when they are in normal condition and causes the disease when in abnormal condition.

Ayurveda states the concept of '*kha vagunya*' in the manifestation of disease. *kha vagunya*' is generally the blank space in which the vitiated *doshas* accumulates which leads to the development of disease.

Acharya Charak stated in *charak samhita sutra sthana*:
Srvanaat Srotansi"^[1]

The transportation of vitiated *doshas* from the place of '*kha vagunya*' to the place where manifestation of disease take place are performed by *Srotas* itself.

Acharya Shushrut mentioned '*khani Srotamsi*' which means that the *srotas* are those where there is the blank space in body or system. Further Shushrut mentioned

that the *srotas* are different from arteries (*dhamni*) and veins (*shira*), considering their anatomical structures, physiological functions and pathological activities.

AIMS AND OBJECTIVE

1. Study the physiological concept of *Srotas*
2. Study the physiological concept of *Mutravaha Srotas*
3. Study the concept of *Mutranirman* in *Ayurveda*

Concept of *Srotas*

Ayurveda deals with biological factors as *Dosha*, *Dushya*, *Srotas*, *Agni* and *Ama*. The action of the drug depends on *Rasa*, *Guna*, *Veerya*, *Vipaka*, and *Prabhava*. By the process of which it acts on the system, drugs. The *Tridoshas* i.e., *Vata*, *Pitta* and *Kapha* are the *Dosha* which are though vitiated the biological condition but not capable to disease production independently at their own basis.

After being vitiated by *Poshaka Dosha*, a disorder or disease has been produced by a series of pathological changes. Only the *Srotas* are Responsible for moving the

vitiated *Poshaka Dosha* from *Kha Vaigunya's* position to the disease's place of manifestation.

YYUTPAITI

"*Srotas*" - "*Sru*" (*Gatyarthak*) *Dhatu* + *Asun* (suffix)

Nirukti

The term "*Srotas*" originated from the root word "*Su Sravane*," which implicates to ooze, to exude, to filter, to impregnate.

Defination of *Srotas*^[2]

The circulation channels carrying the *Dhatu* (tissue elements or their components) undergoing transformation to their destination are, according to *Charaka*, are called *Srotas*. *Srotas* are *Rasadi Dhatu's* pathway. The word '*Parinamapadyamananam*' (meaning undergoing transformation) has been used by *Acharya Charaka* to elaborate the concept, which is indicative of the fact that the channels hold tissue elements that are undergoing transformation from their previous state, such as *Rasa* to its subsequent state *Rakta*. *Rakta* to *Mansa*, *mansa* to *meda* and so on. They bring the use of the word '*Ayanarthena Dhatu*' meaning to their destination (products), but only those of the moving *Dhatu's* (products) that are intended to be converted to another *Dhatu* located elsewhere, are carried by them.

Varna of *Srotas*^[3]

Srotas are known as '*Sva Dhatu Sama Varnani*' because they are very clear and translucent, similar to glass. Blood-carrying *Srotas* have *Rakta Varna*, while *Dushita* blood carrying *Srotas* have *Shyava* or *Nila Varna*. *Gaur* or *Shukla Varna* is on *Srotas* bearing *Rasa* or *Lasika*. *Srotas* that store faeces are the same colour as them. *Nila Varna* is of that *Srotas* that stores *Nila (Pakva) Pitta*. Lowing *Dhatu* is also in *Anu* shape since *Mansadivaha Srotas* are *Sukshma*.

Functions of *Srotas*^[4]

Srotas have the function of transferring *Dhatu's* from one position to another, so all *Bhavas* in *Purusha* never occur or degenerate without them. *Srotas* provide nutrients to all parts of the body. If our *Srotas* are in a *Prakratistha* (healthy) condition, our bodies would be as well. *Malas* are excreted from the body. They perform *Vahana Karma* (prana transfer), *Vegas of Vishaya* (subject), and *Vegas of Cheshta* (activities) across the body.

With the help of their respective *Srotas* (channels of circulation) the *Poshaka Dhatu's* and the *Pushya Dhatu's* gets nourished.^[5]

Functions of the *Srotas*, according to modern thinking, are held by various mechanisms in the body, such as :

- *Poshana Karma* (nutrition) -cell membrane of blood vessels
- *Grahana Karma* (to store)-membrane of the liver.
- *Shoshana Karma* (to absorb) -skin, inner membrane of small intestine.

- *Sravana Karma*-all membranes (to secrete).
- *Vivechana Karma* (to selectivity) -inner membrane of Duodenum and Kidney
- *Nihsarana Karma* (to eliminate)-membranes of nose, eye and urethra.
- *Pachana Karma* (to digest) -membrane of Stomach.
- *Vahana Karma* (to carry) - artery and vein membranes.

In order to understand the physiology of *Mutravaha Srotas* and *mutranirman Prakriya*, we need to understand the general anatomy as well as basic *Ayurvedic* terms mentioned in various *samhitas*.

Mootravaha Srotasa (Urinary system)

Various *Acharyas* has mentioned about the *Mutravaha Srotas* but they described its different *mool* i.e., origin and functions.

According to *Charaka*, *Srotasa* means from where something oozes out.

As a response, *Mootravaha Srotasa*,^[6] refers to the networks that distribute *Mootra*. *Basti* and *Medhra* are the roots of *Mootravaha Srotasa*, according to *Acharya Sushruta*, while *Basti* and *Vankshana* are the roots of *Mootravaha Srotasa*, according to *Charaka* and *Vaagbhata*.^[7]

Any damage or wound to the *Mootravaha Srotas* causes acute urine retention, urinary bladder distension, and painful erection of the penis, both of which contribute to the patient's death.

Mootravaha Naadee (Ureter)^[8]

Mootravaha Naadee is located between *Pakvaashaya* and *Basti*, according to *Sushruta*. They number in the thousands, and their primary purpose is to move the *Mootra* from *Pakvaashaya* to *Basti*, much as rivers do with the ocean. *Vaagbhata* agrees with *Sushruta*, though *Charaka* claims that the *Mootravaha Naadees* are *Basti's* surrounding structures.^[9]

Mootravaha Dhamanee (Renal Arteries)

The *Adhogaamee Dhamanees* have been identified by *Sushruta*. They transport *Vaata*, *Mootra*, *Pureesha*, *Shukra*, *Aartava*, and other objects downward, as well as taking part in the *Saara-kitta Vibhaajana* mechanism. Two of these *Dhamanees* are said to be the *Mootravaha Dhamanees*, who are also on their way to the *Basti*. *Dhaarana* and *Yaapana* of *Mootra* and *Basti* are the functions of which. These are further split into smaller branches, according to *Dalhana*.^[10]

In the *Pakvaashaya* area, *Adhogaamee Dhamanees* are divided into three classes of 30 *Dhamanees*, according to *Sushruta*. Two of them are *Mootravaha Dhamanees*, and they are in favor of *Mootra's* transportation.

Mootravaha Siraa (Renal Veins)

There is no mention of *Mootravaha Siraa* in *Brihatrayee*, but *Shaarangadhara* mentions *Drava Mala* of digested food being transported to *Basti* by *Siraa*, i.e. *Mootra*. According to *Aadhamala's* commentary on *Shaarangadhara*, the *Siraas* are concerned with *Aahaara Jala* being transported to *Basti* via *Mootravaha Siraas*.^[11]

Basti (Urinary bladder)**Definition**

Although there is no perfect description of *Basti* in Ayurvedic classics, the term *Basti* can be interpreted as an organ that stores the *Mootra* (urine).

Embryological Development

Basti is derived from the maternal contribution during foetal life (*Maatrijabhaava*).

The forming of the organ *Basti* during foetal development is defined by *Sushruta* as follows: during the *Paaka* of essence of *Rakta* and *Kapha* with the aid of *Pitta*, *Vaata* enters in between and produces hollow organs such as *Aantra*, *Guda*, and *Basti*.^[12]

Synonyms^[13]

- *Mootraashaya*
- *Mootraadhaara*
- *MootraBasti*
- *Mootraputa*
- *Mootraputaka*

Position

Basti has been included under the *Koshthaangas* and *Aashayas* by all the *Aachaaryas*.²⁵

Charaka - *Basti* is surrounded by *Sthoolaguda*, *Mushka*, *Sevane*, *Shukravaha Naadee* and *Mootravaha Naadee*.^[14]

Sushruta – *Basti* is surrounded by *Naabhi*, *Pristha*, *Kati*, *Mushka*, *Guda*, *Vankshana* and *Shepha*.

Bhaavamishra and Shaarangadhara - Mentioned that *Basti* is located below the *Pakvaashaya*.

Amarakoshakaara - Mentioned it below the *Naabhi*.

Vaagbhata - The *Sthaana* of *Basti* is in *Kati Pradesha*.

Structure:^[15]

Basti is *Alaabu* shaped, with *Siraa* (veins) and *Snaayu* (ligaments) on all sides, according to *Sushruta*. It is *Tanutvaka*, or thin-walled, and has a single downward-directed outlet. The inner relationship between *Basti*, *Basti Siraa*, *Paurusha Granthi*, *Vrishana*, and *Guda*, which is located in the pelvic cavity, is also stated.

Vrikka (Kidney)

Synonyms: *Vrikka*, *Vukka*

Derivation: From the root 'Vrikkaadane' means to take. (*Shabdakosha*)

The *Vrikka* was identified as a *Koshthaanga* by the majority of ancient *Aachaaryas*, revealing *Vrikka's* condition in *Koshtha*. In *Koshtha* (Abdomen), they are two in number and are located on either side of the spine in the lumber area on the posterior abdominal wall.^[16]

Vrikka grows from the *Saara* of *Rakta* and *Meda* during the foetal formation (*Garbhavridhi Kaala*).

They have the same soft quality as *Maatrijabhaava*. There is no clear reference to the role of *Vrikka* in relation to the production of urine in any of the Ayurvedic classics. *Shaarangadhara*, on the other hand, claims that *Mootra* (urine) is derived from the essence of *Meda*.

Gaveenee (Ureter)

They are two in numbers situated on either side of the *Basti*, which carries *Mootra* (urine) from the *Vrikka* to the *Basti* (*Atharvaveda*).

Mootra Praseka (Urethra)**Synonyms**

Mootra Patha (*Paarishadhya Shabdaartha Shaareeram*).
Mootra Maarga,

Mootrapraseka is one of the eight vital organs that must be shielded from damage during *Ashmari's* surgical operation, as injuries to this organ will lead to complications. According to *Dalhana*, it is located at the *Basti* outlet, where the urine exits. It is two *Angula* in length for females and four *Angula* in length for males. Its length in a female child can be much shorter. It carries both *Mootra* and *Shukra* in males, but only *Mootra* in females.

Mootra Nirmaana Prakriyaa:^[17]

The basic principle of *Mootra Nirmaana Prakriyaa*, according to *Sushruta*, is that after the digestion phase, the consumed food is converted into *Saara* (*Prasaada*) and *Kitta* portions by the operation of *Samaana Vaayu*. The *Saara* part is consumed and used as a source of nutrition. *Kitta Bhaaga* incorporates certain nutrients as well as *Mootra* and *Pureesha* precursors. The *Saandra* part of *Kitta* becomes *Pureesha*, and the *Drava* part becomes the *Mootra*.

According to *Sushruta*, the chief organs where *Mootra* is produced are *Pakvaashaya* and *Aamaashaya*, and then it enters *Basti*, where it is packed with oozing urine brought day and night by the channels from the area between *Aamaashaya* and *Pakvaashaya*.

As rivers do with the sea, urine bearing waterways bring saturated urine to the bladder. The other example given by *Sushruta* is that when a fresh pitcher is sunk into water up to its neck, the minute pores present in its walls fill up with water, just as the *Basti* is filled with urine through these minute channels.

DISCUSSION

Srotas is the smallest and finest transport arrangement in the human system which mainly serves the purpose of transportation of the metabolically produced dhatus, doshas. These srotas are responsible for equally both the healthy state of the body or developing the unhealthy state of body.

These *srotas* are numerous in number and are very minute and got no definite shape, size and colour. They are quite different from the *shiras* and *dhamni*. While the functions of the *-Srotas* are similar to that of capillaries in the system, so these can also be correlated and called as the capillary arrangement according to the modern physiology.

And as far as *Mootranirman Prakriya* is concerned *Acharya Shushruta* has mentioned very clearly as stated above the process of formation of urine. According to him the process usually started after the digestion of food and occurs between the *Amashaya* and *Pakavashya*.

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