

A critical review on Mutrautpatti of Ayurveda and its affiliates in modern perspective

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Abstract

While Ayurveda does indeed rely on clinical observations and empirical evidence gathered over centuries, it also encourages investigation and research to deepen understanding and validate its principles.

For instance, Ayurveda's emphasis on *doshas*, *dhatu*s, and *malas* provides a holistic framework for understanding the functions of the body and maintaining health. While Ayurveda is rooted in observation and clinical experience, integrating modern scientific methods can enhance its credibility, efficacy, and applicability in contemporary healthcare settings.

Functions within the body are orchestrated by the *doshas*, while the *dhatu*s sustain bodily functions. Waste products, known as *malas*, are generated through the process of digestion and the metabolism of *dhatu*s. *Malas* are formed within specific channels called *strotas*. Urine, a vital component in maintaining bodily homeostasis, is formed in the urinary system's channels, particularly the *Mutravaha strotas*. According to Ayurvedic texts like Susruta, the main organs associated with the *Mutravaha strotas* are the urinary bladder and urethra. Interestingly, Ayurveda suggests that urine formation begins in the large intestines rather than the kidneys. The initial stage of urine formation involves fluid absorption in the large intestines, after which the urinary system further refines it through processes like filtration and

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reabsorption. This article aims to explore the Ayurvedic perspective on urine formation and how Ayurveda explains the role of the kidneys in this process.

Key words : Ayurveda, Glomerulus filtration, *Mala, Mootra, Mootra Utpatti, Mootravaha srotas, Nisyandana karma, Pkvashaya, Urinary system, Vrukka.*

Ayurveda, the ancient system of India, provides a comprehensive understanding of the anatomical and physiological aspects of the human body. Through its insights into physiology, Ayurveda enables a deeper comprehension of pathological conditions. Specifically, Ayurvedic science elaborates on the anatomical and physiological functions of various bodily systems, including the urinary system. Within this framework, various urinary disorders (*MootraRogas*) such as *Mutragna*, *Mutrakricchra*, *Ashmari* and CKD (Chronic Kidney Diseases) are recognized. Effectively managing these conditions necessitates a thorough understanding of the physiological aspects of the process of formation of urine. Urine formation stands as a crucial physiological process within the human body, wherein both *Mutravaha srotas Moola* (the roots of urinary channels) and waste products from *Aahar Rasa* (food essence) contribute significantly. In Ayurveda, several vital components such as *Basti* (bladder), *Mutravaha Srotansi* (urinary channels), *Vrikka* (kidneys), *Mutravaha Nadies* (urinary vessels), *Mutravaha Dhamanis* (urinary arteries), and *Mutravaha Sira* (urinary veins) play pivotal roles in this process. While modern science identifies the urinary bladder, nephrons, kidneys, ureters, and urethra as vital components involved in urine formation, the Ayurvedic perspective encompasses a broader spectrum of anatomical and physiological elements contributing to this essential bodily

function. The anatomy of the urinary system in Ayurveda is described as follows: According to Sushruta samhita The *MootraVaha Srotas*, or urinary channels, are comprised of the *Basti* (bladder) and *Medra* (penile part of the urethra) as the primary roots (*Moola*)⁶. While conventionally, one might expect the *Vrikka* (kidney) to be considered the root of the urinary channels, it is categorized as the root of the *Medo Vaha Srotas*⁶, a channel primarily associated with fat metabolism. According to Charaka Samhita *Basti* and *vankshna* are the *moola* of *mootra vaha srotas* where chakrapani comment at *vanshana* we can consider it as *vrukka* because *vankshana* means inguinal region and we know there is no any role of inguinal region in urine formation.

Classical text of Ayurveda bhruhatrayi were explored for the references and understanding these references were compile analyzed and discussed for a through and in depth understanding of the concept of *mootranirmiti prakriya*.

Organs related to formation of urine as per Ayurveda:

In Sushruta Samhita at Nidana Sthana shushruta charya explains the process of urine formation in that shloka he mentioned organs involved in that process are as follows⁸

Pakwashaya (large intestine) : Anatomical and physiological important organ for the digestion of food and formation of urine.¹

Site - exists above *shroni* (pelvis), *guda* (anus) and below *nabhi*⁵

Kala - Acharya shusruta mentioned *purishadhara kala*.

Acharya shusruta and Acharya Charak have mentioned *pakwashaya* in *purishavaha srotas*.

Mutravaha Nadi (tubular system): Acharya shusruta has told that thousands numbers of *nadis* are situated in *Pakwashaya* (Large intestine) always carry urine towards bladder like river always carry water to the sea. These *Nadis* (channels) by *Nishyandana* process (Filtration of urine) fills the bladder in state of awakening or sleep. These thousand *nadis* (channels) are invisible so exact location and structures are not mentioned.⁸

Basti (Urinary bladder): In Shabdakosha- “*Vas Acchadane*”(to cover, base, store house and reservoir). In amarkosha- *basti* and *adhonabhi*.

Utpatti - *saar bhaag* of *rakta* (blood) and *shleshma* (mucous) get digested by action of *pitta* and *Vaayu* follow it.⁹

Site - Acharya Shusruta states it is surrounded by *Nabhi* (Umbilicus), *Kati* (Waist), *Mushka* (Scrotum), *Guda* (Rectum), *Vakshanas* (Inguinal region) and *Sepha* (Penis)¹⁰

Ashaya - *mutrashaya* (store house of urine). Acharya shusruta and acharya charak has mentioned *basti* in *mutravaha srotas*.

As we know there is no direct reference of *vrukka* in *mootranirmiti* in Ayurveda it is hidden in between the lines of shloka of *mootranirmiti*.

Following are different references of vrukka from samhitas :

Vrikka (Kidney): In amarkosha - “*vrishasechene*” means irrigation.²

utapatti - *prasad bhag* of *rakta* and *meda*.¹¹

Features - *mamsa pinda* and round in shape.

Number - two.

Site - are situated in the lumbar regions on either side in the posterior

Abdominal wall.¹²

Acharya shusrut and acharya charak has mentioned *vrikka* in *medovahasrotas*. The role of *vrukka* in *medovaha srotas* is fat metabolism and nourishment of abdominal fat.

Mutravaha Srotas : In charka Samhita – Roots of *Mutravaha srotas* are situated in *basti* and two *Vankshana*'s. About this commentator of chakrapani mentioned *mutravaha Srotas* is urinary system, *basti* is urinary bladder. *Vankshana* is a term used to indicate inguinal region. As inguinal region has got nothing to do with the urinary system, this could be a mistake committed by some calligraphers and original term could have been ‘*Vrukka*’ (kidneys). Or, charaka could have meant kidneys by this term itself.¹⁴

Process of formation of urine As per Ayurveda :

In Ayurveda compendia process of formation of urine get started in *pakvashaya*. Sushrutacharya mentioned *Pitta* which is

situated in between the *amashaya* and *pakvashaya* will digest the *chaturvidha annapana* (food) and after digestion separate the digested part in to *Dosha, Rasa, Mootraand Purisha*.⁷

Also in Ashatanghrudya Acharya vagbhata mentioned digested food get divided into two parts as *Sara* and *Kitta*. Again from *kitta* from *accha* (clear fluid) *kitta mootra* formation occurs and from *Ghana part* (solid part) of *kitta* forms *purisha mala*.³

From above references we can say taken food get digested by *jathargani* with the help of *samana vata* and *aahararasa* is formed then again due to *samana vata aahararas* get divided in to *saara* and *kitta*.

Solid part of *kitta* converted in to *purisha mala* and liquid part into *mootramala* then with help of *vyana vata saara* part circulated all over body and carry *drava kitta* up to the *vrukka* for further process of *nishkramana* (elimination) as its *nirutki* in amarkosha “*vrishasechene*” means irrigation.²

In detail process of urine formation explained by *Sushrutacharya* in *nidana sthana* Vessels arising from large intestine, called *mutravaha nadya*. Fill the urinary bladder like revers feed water to oceans on earth. They are so minute that they are not be perceived. These vessels arise from *Amashaya* and convey fluid to bladder day and night. Thousands of these vessels provide *mootra* to *basti* through *nisyandana karma*.

Like new water pitcher dipped in water till neck get filled by small thousands minute pores same way bladder gets filled by thousands

small openings of *srotas* (channels) around it.⁸

In relation to above reference with the help of contemporary science we can read between the lines and understand the role of *vrukka* in relation to *mootramala*. After the digestion essence of food absorbed from large intestine through supra mesenteric vein and infra mesenteric veins and get in circulation through hepatic portal vein with the help of *vyana vata* a sub type of *vata dosha*. These Vessels arising from large intestine, called *mutravaha nadya*. In same way *vyana vata* also carry *drava kitta* in the form of *kleda* up to the *vrukka* for *nisyandana karma* (filtration/irrigation). Commentator *dhalana* comment on *sukshmatavat* means the *mutravaha nadya* gets divided into *sahastradha* (thousand channels)⁸ so, not perceivable by naked eyes. And that *mutravaha nadya* performs the *nisyandana karma* (filtration/irrigation) day and night continuously as *sushrutacharya* gave the example of new *ghata* (earthen pot) how it feels through pores when put in the water up to neck of *ghata*. Similarly *mutravaha nadya* which performs *nisyandana karma* fills the *basti* (bladder). This is all about functional similarity of *nisyandana karma*. Now anatomical similarity of *gahta* (earthen pot) we can correlate with the glomerulus of nephron which also performs the *nisyandana karma* (filtration/irrigation). Structurally endothelial membrane of glomerulus have slit pores as like *ghata* (earthen pot) so we can correlate *ghata* (earthen pot) with glomerulus of nephron.(fig. 1) In this way we can relate the *vrukka* and its role in *mootranirmiti* and *nishkramana karma*. In the last *Basti* holds that urine with the help of *parana vata* for some time then *apana vata* excrete it out through *medhra* (urethra).

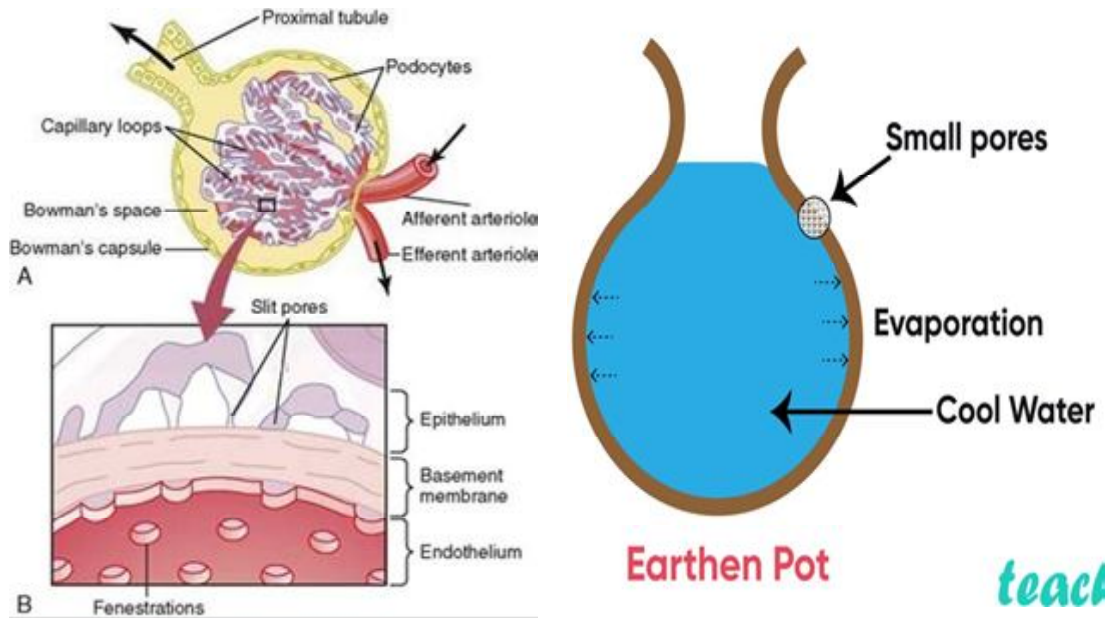


Fig. 1-similarity in earthen pot and membrane of glomerulus.

Studying thoroughly the concept of urine production and excretion from ayurvedic and modern literatures conclusion drawn is that *acharyas* has defined urine formation and secretion process similar to modern explanation. Location of urine formation is *pakvashaya* (large intestine) and formed with the help of *samana vata* and *jatharagni*. And *vyana vata* and *samana vata* collect the urine in *basti* through *nisyanadana karma* with the help of glomerular part of nephron in *vrukka*. Then *apana vata* excrete *mootra* out through *medhra* (urethra).

As Ayurveda explains urine formation process in clinical point of view as we observe in diarrhea patient when water loss occur in the form of fecal matter through *pakvashaya* (large intestine) then urine output get decreased.

Also we see in kidney failure patient a condition where the kidneys not able to filter blood so, peritoneal dialysis is the way to remove waste products from blood. In this process we remove waste products from *pakvashaya* only so it clears the way Acharya mention *pakvashaya* in the urine formation and kidney is only separation and elimination unit.

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