Review Article

Assessment and evaluation of Srotomula

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Abstract:

Srotas is a structural and functional unit of the body through which substances flow from one part to another. Each Srotas is said to associate with two organs which are termed as Srotomula. Srotomula is the most vital part of the Srotas just like the root of the tree. In classics neither the detail description about Srotomula is available nor the reason mentioned for considering particular organs as the Srotomula. Hence the present study was undertaken with the aim to assess and evaluate the relation between Srotas and its Mula. Also it is essential to compare the views of both Charaka and Sushruta regarding Srotomula. For present study relevant information regarding Srotas and its respective Dhatu from Samhitas, various texts, articles etc was compiled and interpreted. After analyzing all the conceptual material it was found that Srotomula could be considered as either the originating place, storage place, controlling place, conduction place, terminating end or the site of manifestation etc. After comparing the views of both Acharyas it was found that Charaka has narrated the concept from physiological point of view whereas Sushruta has given more emphasis on the anatomical aspect of Srotomula.

Key words: Srotas, Srotomula, Charakasamhita, Sushrutasamhita

INTRODUCTION:

Human body is mainly composed of three kinds of material viz. Dosha, Dhatu and Mala [1]. Although all these entities are present in body itself, but some kind of transporting system is required to carry these material from the site of production to the site of action. For such transportation of body constituents, the special term 'Srotas' is used which denotes a channel through which substance flow from one part to another part [2]. Srotas is a structural and functional unit of the body. For any structural or functional constitution two ends are necessary. From the one end it will start or begin the functions and at the other end it will finish the functions. Hence, for Srotas the two entities are designed in terms of body organs which are described as Srotomula (root of Srotas).

All the ancient Acharyas described two Mula's for each Srotas but the reason of considering specific organ as Mula of particular Srotas is nowhere mentioned in classics. Acharya Sushruta and Chakrapani had given the definition but that too is not enough to describe the information about Mula. Chakrapani has compared the Srotomula with the root of the tree and said that as the injury to root leads to the destruction of the tree, similarly injury to Srotomula can affect the whole Srotas [3]. So, Mula can be the physiological or anatomical controlling centre of the Srotas due to
which body maintains its dynamic equilibrium. From the conceptual point of view there is hardly any description about the term 'Srotomula'. The research works carried out on 'Srotomula' enables in understanding the concept somewhat. The foremost work on Srotomula in detail was done by Deshapande A. et. al. which considered the Srotomula as the Samgrahasthana, Samcharisthana, Abhivyaktisthana, Nyantraksthana, Samchayasthana etc [4]. M.K. Madankumar et. al. concluded that Mulasthana are better understood as governing sites of formed Dhatus [5]. Deeja C.R. et. al. concluded that Mulasthana is the master organ of the particular system which may be developmental or generative place [6]. Pawar Pradeep Shivram concluded that assessment of Srotomula cannot be ascertained always in the prever of anatomical angle. In this regard the controlling inputs of the functions of the Srotas and the physiological angles are also to be considered [7]. All these works gives some direction about what Srotomula could be but has not been dealt with enough examples and details to explore the concept.

Hence the present study was undertaken to assess and evaluate the concept of Srotomula and find out its different perspectives in relation to Srotas. The study was also determined to compare the views of Acharya Charaka and Sushruta on Srotomula.

Methods:
For the assessment and evaluation of Srotomula, literary material like Srotodushti Karan, Srotodushti Lakshan, Kshaya, Vriddhī and Prakopa Lakshana along with normal functions of particular Dhatus, treatment of Srotas and its Dhatus etc. were compiled and analyzed from Brihatrayi, Laghutrayi, various dictionaries, texts, research articles etc.

Observations and Results:
According to the Sanskrit lexicons the word 'Mula' is derived from the Sanskrit root, “Mule Pratisthayam” which indicate about the surface or the base on which the particular things are resting. Another derivation is “Mulam tu Adikaranam” according to which the first causative factor of any phenomenon is known as Mula [8].

After analyzing the term 'Mula' through various dictionaries it was found giving different meanings like Ropane (causing to grow), Antike (reaching to the end), Jata (the root), Padam (strong base), Shifa (flexible root), Bandhane (dependent on), Karan (elementary cause) etc [9]. All these terms were applied in the context of Srotomula to understand it and also to understand the relation between Srotas and Srotomula.

As per the definition given by Chakrapani, Mula is the 'Prabhavasthāna' means the originating place or the governing site [10]. Sushruta considered Mula as the hollow organ from which the Srotas starts [11]. Both Charaka and Sushruta have described two roots (or three) for each Srotas which are listed in table 1[12, 13].

Discussion:
After analyzing the literary material, various aspects of Srotomula was understood and it was found to performing various kinds of functions related to particular Srotas. Based on this following terms could be applied to Srotomula

Prabhavasthāna (Place of origin/nutrition):
According to the definition, Srotomula is considered as the Prabhavasthāna i.e. the place of origin from where the particular Srotas commences or gets the nutrition. In case of Raktavaha Srotas, Rakta is mainly produced at Yakrit and Pleeha; hence these are considered as the root organs. In case of Mutravaha Srotas also it has been said that Vankshana and Basti are associated with Mutra Utpatti [14]; so they are considered as root organs. Vrikkas is one of the roots of Medovaha Srotas. According to Sharangadhara the Vrikkas nourishes the Medodhatu inside the stomach area of the abdominal cavity [15]. After the completion of digestion process, the formation of Purisha takes place in Pakvashaya; especially proximal 1/3 part of the large intestine is mainly related with the production of fecal matter. Hence from all the above examples it can be said the root organ is the place of origin for particular Srotas. According to the theory of Dhatu Utpatti, previous Dhatu is the precursor of next Dhatu [16]. According to Vagbhata Mansa, Meda, Asthi and Majja are the root organs of Medovaha, Asthivaha, Majjavaha and Shukravaha Srotas respectively [17]. Meda is told as the Mula of Swedovaha Srotas. All these examples suggest that root organs are such from where the particular Dhatu gets its nourishment.
Samchara/Vahana Sthana (Conduction place):

The *Srotas* generally does the function of transportation of body tissues which are under metabolic processes. The part of the *Srotas* which helps to carry the nutritive material to respective *Dhatu* or its destination is considered as the root organ is some cases. *Rasavahi dhama*nis are told as the root of Rasavaha Srotas, which carries the function of circulation of ‘Rasa’ all over the body [18]. Similarly Rashavahi dhama*nis and Aartvavahi dhama*nis also does the function of carrying their respective *Dhatu*. The Shukradhatu (semen) formed in *Vrishan* is conducted into female's body via Shepha. The Purisha formed in Pakvashaya is excreted out with the help of Shulaguda or Adharaguda. Similarly the Mutra (urine) stored in *Basti* is transferred via Vankshana Pradesha upto the Bahirmukha Srotas. All the above examples indicate that the root organ does the function of conduction and hence can be considered as the conduction place.

Niyantraka Sthana (Controlling point):

As per the etymology *Mula* is the base or the governing site of particular *Srotas* and it controls the physiology of that *Srotas*. Any kind of impairment at such place leads to the disturbance in the functioning of that *Srotas*. Whenever there is any kind of injury/abnormality at *Hriday* the function of both Pranavaha and Rasavaha Srotas gets disturbed and various kinds of diseases are produced. For e.g. In *Hridroga* the symptoms like Shwasa, Kasa, Hicka etc. are produced which indicates the vitiation of Pranavaha Srotas whereas the symptoms like Aasyavairasya, Aruchi, Jwara, Tandra etc. indicates Rasavaha Srotodushti [19]. In the normal state of Mahasrotas, breathing process in Pranavaha *Srotas* occurs properly and if there is any disease pertaining to organs inside the *Ko*sth*ha*, will lead to Pranavaha Srotodushti. For e.g. in Udhararoga, Gulma etc. there is difficulty in expiration [20]. In Yakrit Plee*ha* Vidradhi there is obstruction in Shwasmarga, which results in difficulty in expiration and in Nabh*vi* Vidradhi, hiccup is produced [21]. All these examples suggest that Mahasrotas works as controlling place for Pranavaha Srotas. Similarly *Vamaparshwa* i.e. *Grahani* is considered as the chief organ of Annavaha Srotas and the whole digestion process mainly depends upon the function of *Grahani* [22]. In case of impairment of *Grahani*, the process of digestion gets hampered and *Ama* is produced. In the context of *Medodhatu*, many Scholars consider ‘Vrikka’ as the Supra-renal gland which regulates the fat metabolism in the body. Few scholars consider 'Pancreas' as *Vapavahana*. Pancreas also controls the process of fat digestion [23]. Charaka mentioned *Jaghana* as the principal organ of *Asthidhatu*. Any problem with *jaghana* or groin region leads to disturbance in the upright position of living body because pelvic bones are pillars of the body. The impairment in *Basti* leads to vitiation of *Murtavaha Srotas*. *Mula*, the *Mula* of *Swedovaha Srotas* when gets increased in quantity the Symptoms like *Snigdhanga*ta, Daurgandhya are produced which are related to *Swedovaha Srotas* [24]. Garbhashaya when gets impaired also produces the symptoms of vitiation of *Artravaha Srotas* like Alpartava, Atyartava etc [25].

Samgrahasthana (Storage place):

As said earlier *Srotomula* can be considered as the chief organ of that *Srotas* where most of the *Dhatu* of particular *Srotas* is stored. In the context of *Raktavaha Srotas Rakta* is mainly stored at Yakrit and Plee*ha* [26]. *Amashaya* is the storage place of *Anna* (food). In case of *Medovaha Srotas* if Vapavahana is considered as *Omentum* then it can be said that it is the place where maximum fat accumulates. Sushruta told *Kati* as the *Mulasthan* at where also most of the *Meda* (fat) accumulates. In context of *Majjavaha Srotas*, Majja is basically found in long bones. The tissue bone marrow occupies the internal cavities of bones. Shukradhatu although belongs to each and every corner of body is produced in ‘*Vrishan*’ and after that it stored there for proper time. Purisha also after its formation is stored in Pakvashaya (especially distal 2/3 part of the large intestine) till suitable period. Likewise, the *Mutra* also gets stored at its root i.e. *Basti* [27]. All such examples are definitely indicative about the storage function of root organs. Hence they can be considered as the storage place of particular *Srotas*.

Antima sthana (End point):

The term *Mula* also gives the meaning like end or last part. *Vamaparshwa* i.e. *Grahani* holds the food until the complete digestion and then after the division of *Sara* and *Kitta*, the material is relieved for further processing into the
Purishavaha Srotas [28]. In case of Shukravaha and Mutravaha Srotas, Shepa (penis) is one of the root which is clearly perceptible as the terminating end. Stuhlaguda or Adharaguda is the end point of Purishavaha Srotas through which the Purisha is thrown out of the body. Likewise, Lomakupas are the terminating end of Swedovaha Srotas through which the Sweda (sweat) is secreted out of the body. From all such examples it can be said that the specific place where the particular Srotas ends is the root organ of that Srotas.

**Abhivyaktisthana (site of manifestation):**

It is a well known fact that Srotas and Srotomula are interdependent and hence vitiation of one leads to the vitiation of other. In the vitiation of Udakavaha Srotas the disease Trishna is produced which is manifested at Talu and Kloma. Similarly in the vitiation of Annavaha Srotas the symptoms like Arochaka, Avipaka, chhardi etc. are produced which are associated with Amashaya [29]. In Rasakshaya the symptom like 'Hridayam tamyati' and Hridayapida are produced [30] and in Rasavirdhiddhi 'Hridayayotkleda' is mentioned [31]. All these symptoms indicate deformity of the organ 'Hriday' which is the Mulasthana of Annavaha Srotas. The vitiation of Raktavaha Srotas leads to the diseases like Kamala and Pleeha (enlargement of spleen) are produced which are pertained to the organs Yakrit and Pleeha. In the vitiation of Mamsavaha Srotas various diseases like Arbuda, Keela, Alaji etc. are produced [32] which are pertained to skin (Twak) which is said to be the Mulasthana of Mamsavaha Srotas. Snayu is another Mulasthana of Mamsavaha Srotas. In Mamsakshaya the function of Snayu also gets diminished and hence the symptoms like Sandhivedana, Sandhisphotana are produced [33]. Prodromal symptoms of diabetes are produced in the vitiation of Medovaha Srotas, which shows the disturbance in the functions of Vriikka (kidney). In Medakshaya symptoms like Katiswapa or Katiksheenata are seen [34]. Further, most of the obese persons give the history of Katishula and katigawara which is the Mulasthana of Medovaha Srotas. In Majjakshaya the symptoms like Asthinistoda, Asthisaushirya, Asthiushnata are produced which are related to its Mula i.e Asthi [35].

**Shukrakshaya** gives rise to the symptoms like Medhra and Vrishan Vedana, Medhra and Vrishan Toda, Medhra Dhumayana etc. which are pertained to the Mulasthanas of Shukravaha Srotas [36]. In Mutrakshaya and Mutravirdhiddhi the symptom 'Bastinistoda' is found which is related to Mutravaha Srotomula i.e. Basti [37]. In Swedakshaya the symptoms produced are Stabdharomakupata, Romachyuti, Kandu, Lomaharsha etc. indicating the involvement 'Lomakup' which is the Mula of Swedovaha Srotas [38]. All these examples prove that almost all the Srotas when gets vitiated produces the symptoms targeted to their root organs.

**Comparison of the views:**

If one compares the views of Charaka and Sushruta on Srotomula, there is diversity at some places. Acharya Charaka has described the Srotomula’s in context of vitiation of Srotas and by analyzing the root organs it could be said that they are described from physiological or pathological perspective mostly. But Sushruta has described the Srotas in context of Mula Vidhhalakshanas, hence primarily focused on the anatomical or surgical aspect. Regarding Udakavaha, Raktaavaha and Prereshavaha Srotas, all the three Acharyas Charaka, Sushruta and Vagbhata have almost identical opinion. The major difference between Charaka and Sushruta is that the latter has not described the Mulas of Asthivaha, Majjavaha and Swedavaha Srotas due to the reason that Mulas of all these Srotas are present in whole body. Dalhana gave the reason that injury to such roots is not useful for the knowledge of prognosis of the disease and also the disease pertaining to the whole body is under the rights of medicinal community whereas the people of Shalyatantra have to deal with local diseases mainly. While explaining the Srotomula, Sushruta has given more emphasis on Dhamani as he has described Dhamani as Mula of the Srotas in many cases like Rasavahai Dhamani as the Mula for Pranavaha and Rasavaha Srotas, Raktaavahi Dhamani for Raktaavaha and Mamsavaha Srotas and Artavahva Dhamanat for Artavahva Srotas. The probable reason may be that Dhamani supplies the necessary material to the particular Srotas to work properly.

Acharya Charaka has described specific regions as the Mula of particular Srotas like Mahasrotas for Pranavaha, Vamaparshva for...
Annavaaha, Jaghana for Ashtivaha, Vankshkana for Mutravaha etc. This may be due to the fact that these regions are taking part in the normal physiology of that Srotas and also any deformity in that region will affect the functioning of Srotas. The other reason could be that the major part of those Srotasas may be lying in that particular area. In some cases particular Dhatu is mentioned as the Srotomula like Mamsa for Medovaha, Meda for Asthivaha and Swedavaha, Asthi for Majjavaha etc. All this relations highlight the basic theory of Ayurveda 'One Dhatu is the precursor of next Dhatu'.

The first three Srotasas viz. Pranavaha, Udakavaha and Annavaaha have their Mulasthana as such organs which converts the Bahya Prana into body acceptable form and also helps in maintenance of them. Among Dhatuvaaha Srotasas, in most of the cases one Srotomula does the function of providing nutrition to that Dhatu and the other Mula serves the controlling centre of that Srotas. In the context of Malavaha Srotasas, among the two Srotomulas described one serves as the controlling place or the origin place and the other Mula carries the function of excretion. As in case of Mutravaha, Pureshavaha and Swedavaha Srotas, Basti, Pakvashaya and Meda works as the controlling and Originating point respectively whereas Medhra, Guda and Lomakupa helps in the excretion of these Srotasas respectively.

Though the science is advanced a lot but in Ayurveda there are still many things which are not fully explored yet especially regarding some of the organs like Kloma, Vapavahana, Vrikka etc. there is no unique opinion in Ayurvedic fraternity. Hence unless and until one has clear idea about these organs,

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<th>Srotas Mula</th>
<th>Table 1: Showing Srotasas and their Mula</th>
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<tr>
<td>Pranavaha</td>
<td>Graphica (heart)</td>
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<tr>
<td>Annavaaha</td>
<td>Mahasrotas (abdomen)</td>
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<td>Udakavaha</td>
<td>Vamaparshava (duodenum)</td>
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<tr>
<td>Rasavaha</td>
<td>Hriday, Dashadhamani (ten vessels)</td>
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<td>Raktavaha</td>
<td>Yakrit (liver)</td>
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<td>Mamsavaha</td>
<td>Snayu (ligaments)</td>
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<tr>
<td>Medowaha</td>
<td>Vrikka (kidneys)</td>
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<tr>
<td>Asthivaha</td>
<td>Meda (adipose tissue)</td>
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<tr>
<td>Majjavaha</td>
<td>Asthi (bones)</td>
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<td>Shukravaha</td>
<td>Vrishan (testicles)</td>
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<td>Artavavaha</td>
<td>Garbhashay, Artavavahi dhamani</td>
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<td>Purishavaha</td>
<td>Pakvashaya (colon)</td>
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<td>Mutravaha</td>
<td>Basti (bladder)</td>
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<td>Swedovaha</td>
<td>Meda (adipose tissue)</td>
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it is difficult to find the relation of these organs with their Srotasas.

CONCLUSION:

Srotomula is found to be the main functioning centre of particular Srotas. Any kind of vitiation of Srotas either directly or through its Dhatu leads to the vitiation of its Mula and when Srotomula is affected it leads to the vitiation of Srotas. Hence, it could be said that there is 'Samavaya Sambandha' between Srotas and Srotomula. The term used 'Prabhavasthana' used for Srotomula should be considered as either the origin place, storage place, controlling site conduction place, terminating place or site of manifestation for various Srotasas. Acharya Charaka has described the concept of Srotomula mainly from physiological point of view whereas Sushruta had given emphasis on the anatomical aspect of the Srotomula.

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