

A CRITICAL AND ANATOMICAL STUDY OF RAKTAVAHA SROTAS MOOLA – A
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ABSTRACT

The life science of *Ayurveda* has been teaching the art of healthy life (physical, mental and spiritual) from ages. *Ayurveda* includes a detailed explanation of the human body, in terms of *Dosha*, *Dhatu*, *Malas*, *Srotas*, *Kostha*, *Kostangas*, and so on. "*Srotas*" is short for "*Sraavanat Srotansi*," which might imply exudation, seeping, filtering, flowing, moving, and so on. Hence *Srotas* can be defined as channels or capillaries or micro-capillaries where '*Sraavan Kriya*' is going on. Every *Srotas* has its own *Moolasthan*, or root. *Moolasthan* of *Srotas* was described by *Chakrapani* as *PrabhavaSthana*, which signifies the anatomical seat of respective *Srotas*, the major seat of pathological alterations, diagnostic value, or therapy emphasis. In *Ayurveda Yakrit* (liver) *Pleeha*(spleen) and *Raktavahi Dhaminiyan* (greater artery of body) are known as *Moola*(basis) of *Raktavaha Srotas*. The main *Dhatu* (body component) which has relation with *Yakrit* and *Pleeha* is *Rakta*(blood). So most of the diseases of *Yakrit* and *Pleeha* has the involvement pathology of *RaktaDhatu*. *Ayurvedic Acharyas* have described that the entire range of life processes in health and disease depends on integrity of the *Srotas* system which is prone to lose its integrity due to out of order lifestyle and faulty food. Therefore the fundamental applied aspect of *Srotas* in order to understand disease process in accordance with Modern Anatomical knowledge is need of time. In this research paper Reappraisal of ancient knowledge about *Raktavaha Srotas Moola* specially on modern parameters is studied.

KEYWORDS: *Srotas*, *Moolasthan*, *Yakrit*, *Pleeha*.

INTRODUCTION

Ayurveda has very vividly described the anatomy of the human body, among which the term *Srotas* (body channels) is considered as an important entity of the body. *Srotas* can be considered as the minutes or the structural and functional unit of each organ, which play a very crucial role in biological processes i.e physiological and pathological processes of human body. *Ayurvedic* classics proclaim "*Srotamayam hi shariram*" means that living body is a channel system and/or is comprised of innumerable channels which are designed as inner transport system for divergent function, gross and subtle, biological and energetic. Body-mind-spirit organization has as many as *Srotamsi* the number of life factors operating in the life process- *Yawantah Purush* *Murtimanto Bhavavisheshah Tavantevasmin Srotasam Prakara Visheshah*.^[1] Ordinarily the word *Srotas* is used as a generic term indicating all the macro and micro channels and pathways operating in the living organism. The present study is focused on the description of

Raktavaha Srotas and its *Moolasthan* as described in different *Samhita* and its possible clinical correlation as described in modern medical literature along with its clinical importance.

AIMS AND OBJECTIVE

To study the anatomical aspect of *Raktavaha Srotas Moolasthan* as per ancient and contemporary science with the help of related Ancient & contemporary texts, which is helpful for diagnosis & treatment of various diseases.

CLASSICAL REVIEW

स्रोतस परिभाषा

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स्रोत, परिणामप्राप्त धातुओं को अन्यत्र ले जाने के लिए वहन करने वाले होते हैं।

मूलात् खादन्तरं देहे प्रसृतं त्वभिवाहि यत् ॥ स्रोतस्तदिति विज्ञेयं सिराधमनिवर्जितम् ॥ सुश्रुतशरीर (9/13)

That which originates from vacant spaces (hollow organs) spread through out the body and purveys material are to be understood as *Srotas* (channels) and apart from *Sira* (Vein) and *Dhamni*(Artery).

The synonyms of Srotas are: *Sira* (vein), *Dhamni* (arteries), *Rasayani* (lymphatics), *Rasvahini* (capillaries), *Nadi* (ducts), *Pantha* (passage), *Marga* (channels), *Sharirchidrani* (sphincters) *Sthanani* (site), *Niketa* (places), *Ashaya* (recipient), *Rasvahaniya* (lymphatic), *Samvrita-asamvrita* (open and blind passages), *Ashayas* (spaces), *Sharir Dhatwaavaksh Lakshyana- alakshyana* (visible and invisible interstitial).^[2]

स्रोतस स्वरूप

स्वधातुसमवर्णानि वृत्तस्थूलान्यणूनि च । स्रोतांसि दीर्घाण्याकृत्या प्रतानसदृशानि च ॥ ((च.वि. ५/२५)

i.e *Srotas* have same colour similar to that of their own *Dhatu*s, are tubular, large or small, long and branch like in shape.

Charaka identified 13 gross channels^[3] while *Acharya Susruta* mentioned 11 pairs of *Srotas*^[4] One of them is *Raktavaha Srotas*. *Srotas* are innumerable in numbers and represent the inner transport system of the body.

रक्तवह स्रोतस

.मूलः

"शोणितवहानां स्रोतसां यकृन्मूलं प्लीहा च।" (च.वि. ५/७)

-रक्तवह स्रोतों का मूल यकृत और प्लीहा है।

"रक्तवहे द्वे, तयोर्मूलं यकृत्प्लीहानौ रक्तवाहिन्यश्च धमन्यः ।" (सु.शा. ९/११)

-रक्तवह स्रोत दो हैं- इनके मूल यकृत, प्लीहा और रक्त को वहन करने वाली धमनियाँ हैं।

-In context of *Srotas* its *MoolSthana* is determined as the *Dhatu's Utpatti Sthana*, *Sangrah Sthana*, and *Vahan Sthana*.^[5] The word meaning of *Raktavaha Srotas* signifies that, the channel through which *Rakta* flows can be considered as the *Raktavaha Srotas* The root of *Raktavaha Srotas* is considered as *Yakrit*(Liver) and *Pleeha*(Spleen). Injury to *Raktavaha Srotas* leads to Cynosis, Fever, Anemia, hemorrhage, reddish discoloration of eyes.^[6]

Raktavahasrotas Dushti Hetu^[7]

Acharya Charaka has mentioned various factors of *Raktavaha srotas dusti*. They are due to intake of *Vidahianna* (food which causes burning sensation) and

Pana (drinks), *Snigdha* (oily), *Ushna* (hot) *Drava* (liquid) food consumption along with exposure to *Atapa* (sunlight) and *Anila* (air) which lead to *Raktavaha Srotas Dushti*.

According to Ayurveda classics the *Rakta Dhatu* is made by transformation of *Rasa*. In the liver and spleen by the help of *Ranjaka pitta*.

तेजो रसानां सर्वेषां मनुजानां यदुच्यते ।

पित्तोष्मणः स रागेण रसो रक्तत्वमृच्छति ॥ (च.वि. 15/28)

i.e In humans the *Rasa* acquire redness to transform into *Rakta* with the help of essence of food we consume and the heat of *Pitta*.

यत्तु यकृत्प्लीनोः पित्तं तस्मिन् रञ्जकोऽग्निरिति सञ्ज्ञा, स रसस्य रागकृदुक्तः । (सु. सू. 21/10)

i.e The *Pitta* remains in *Yakrit* and *Pleeha* called as *Ranjaka Agni* and this *Pitta* colours the *Rasa* Classical explanation of *Yakrit* and *Pleeha*

The *Yakrit* is one of the *Kosthanga*^[8] which maintains the metabolic function of the human body. It is situated on the right and inferior to the *Hridaya*,^[9] The *Yakrit* is the maternal derivatives (*Matrijadi bhava*)^[10] from the essence part of *Rakta*^[11] *Acharya Sushruta* has compared the colour of *Yakrit* with the colour of *Pittaja Arsha* with *Shukajihva*, i.e., tongue of parrot^[12] It is also the site of *Ranjaka pitta*.

The *Pleeha* is a *Kosthanga* situated below and left to the *Hridaya*.^[9] The *Pleeha* is developed from *Matrijadi bhava* and also derived from *Rakta*. *Dhamani* is the structure which nourishes the body and maintains the function of the body properly. In other versions, it is the structure which feels pulsation. *Dhamani* originated from *Nabhi*. It spreads like spokes of the wheel. It is 24 in number.^[13] The *Rakthavahini Dhamani* are the structure which carries *Rakta* to a different part of the body.

Contemporary View of Liver And Spleen^[14]

Liver is made up of liver cells called hepatocytes and a system of blood vessels. Liver consists of many lobes, each lobe consists of segments, lobules. Each lobule is honey comb like structure. The cells are arranged in different plates. Each plate is one cell thick with a central vein. In between the cells are bile canaliculi. Each lobule is surrounded by portal vein and tributary of bile duct. In between the plates, the sinusoid receives blood from a branch of portal vein and a branch of hepatic artery of the portal triad. Sinusoids are lined by endothelial cells. Few macrophage cells called kupffer cells are also found in between the endothelial cells. Sinusoids are surrounded by the perisinusoidal space or space of disse, which contains cells, which store vitamin A. Portal vein, hepatic artery and hepatic bile duct and a lymphatic

vessel. The liver is supplied by Hepatic artery (20% blood supply) and portal vein (80% blood supply) empty into hepatic sinusoidal network, which drain to hepatic veins, which drain to the Inferior vena cava.

The Spleen is a lymphoid organ. Spleen plays multiple supporting roles in the body. It acts a filter for blood as part of the immune system. Old red blood cells are recycled in the spleen, and platelets and white blood cells are stored there. Histologically, spleen consists of Red pulp & white pulp. Red pulp contains splenic cords surrounded by sinusoids & white pulp contains lymphoid aggregations with eccentric central artery. Spleen has thick capsule, sends septa into substance of spleen. White pulp is aggregation of lymphocytes around the artery. The periarterial lymphatic sheath is made of T lymphocytes. At some places it forms lymphatic nodules with germinal centers called as Malpighian bodies. They contain B lymphocytes. Red pulp forms the major part of spleen. It is made of lymphocytes arranged like branching and anastomosing cords along the sinusoids. Central artery from pulp enters red pulp and divides into straight vessels called as penicilli. It is then surrounded by sheath of macrophages and is called as ellipsoid which has a narrow lumen. Further it dilates to form ampulla and blood enters sinusoids of red pulp by two ways. In closed circulation theory blood directly enters in to sinusoids from ampulla. In open circulation theory blood passes out of capillaries between the cords and then enters sinusoids. The spleen is supplied by the splenic artery. It is the branch of celiac trunk, and celiac trunk is the main branch of abdominal aorta. The spleen is drained by splenic vein.

Haemopoiesis^[15]: In developing embryos, blood formation occurs in aggregates of blood cells in the yolk sac, called blood islands. As development progresses, blood formation occurs in the spleen, liver, and lymph nodes. When bone marrow develops, it eventually assumes the task of forming most of the blood cells for the entire organism.

DISCUSSION

As regards, the formation of *Raktadhatu* and its distribution the *Ayurveda* takes into account a group of organs involved in the process of genesis directly or indirectly. From these organs, the *Raktadhatu*, after getting originated follow certain tracts or roots to reach in the channels of greater circulation and from there to each and every part of the body, appear to come under the heading of *Raktavaha srotas*, this phenomenon is also been discussed in *Charak Vimanshana* chapter 5. The *Moolasthan* is considered to understand the *Rachanatmaka* concept of *Raktavaha srotas*. Both *Charaka* and *Vagbhata* stated the *Moola* for *Raktavaha srotas* as *Yakrit* and *Pleeha* (Liver and Spleen) whereas *Susruta* has also considered *Raktavahni Dhamani* alongwith *Yakrit* and *Pleeha*. The *Raktavahni Dhamani* can be understand as greater blood vessels, arteries, veins and capillaries. Hence a clear understanding about

the origin place of *Raktadhatu* and its link with the *Raktavaha srotas* gets verified with *Acharya Charak* statement in *Chikitsa sthan* 4th chapter where he has taken *Yakrit* and *Pleeha* into account and stated them as an *Adhishtana* (root place for the disease) for *Raktapitta vyadhi*. In ancient texts clear description of *Yakrit* and *Pleeha* is not present.

In classics the diseases like *Kustha*, *Visrpa*, *Pidika*, *Kamala*, *Asrgdar*, *Arubuda*, *Arsa*, *Raktapitta* etc are known as the the disease of *Raktavaha srotas* and *Yakrit* and *Pleeha* are considered as the seat (root) in their pathogenesis.

Ayurveda helps in diagnosis of affected *Srotas*, its nature and extent of blockage and ultimately helps in finding out the process of disease. The disease enumerated by *Charaka* as of *Raktavaha Srotodusti* or *Raktadhatu Dusti* appears not to be of the same system according to the knowledge of modern medical science. However symptoms narrated by *Susruta* regarding the *Raktavaha Sroto Moola* injury^[6] appear to be very much correct with symptoms of hepato-splenic injury as described in contemporary medical science. From literary study we observe that from formation of blood to destruction of blood cells, liver and spleen are involved. Blood is formed in middle trimester in liver and gets destructed in spleen. Apart from that there is rich supply of blood in liver and spleen. Nutrients absorbed from intestine after digestion is collected through portal vein and then it enters liver and further assimilation and metabolism of absorbed nutrients occurs in liver and then it is used for development and maintenance of body tissues.

CONCLUSION

- The wholesome of *Srotas* can be grouped into physio-anatomical units which performs specified functions in the body and anatomically identifiable based on their *Moola*.
- In *Ayurveda* *Yakrit* (liver), *Pleeha* (spleen) and *Raktavahi Dhaminiyan* (greater artery of body) are known as *Moola* (basis) of *Raktavaha Srotas*. The main *Dhatu* (body component) which has relation with *Yakrit* and *Pleeha* is *Rakta* (blood).
- *Yakrit* is situated in Right hypochondrium. It has relation with *kloma* because both are situated in the right side of the heart.
- The colour of *Yakrit* (Liver) i.e. reddish brown or dark brown can be correlated with the color of *Shukajihva*.
- *Ranjana* of *Rasa Dhatu* can be matched with hematopoiesis
- Most of the diseases of *Yakrit* and *Pleeha* has the involvement pathology of *Rakta Dhatu*. *Yakrit vikaras* (Liver disorders) are comprehensively elaborated in *Samhitas* where there is structural and physiological integrity of the liver is affected.
- In *Ayurveda* *Acharyas* have also opinioned about the development of *Yakrit* from *Rakta Dhatu*. Parallel opinion in conventional anatomy states that

abundant quantity of blood is responsible for the formation of sinusoids.

- The *Pleeha* (spleen) is located in left upper quadrant of abdomen. It plays important roles in regard to red blood cells and immune system. It removes old blood cells and hold a reserve of blood.
- *Raktavaha srotas* from its *Utpattisthana* we can compare with Haemopoietic system. From the *Sangrahashthana* come to know liver and spleen acts as a reservoir of blood. From the *Vahansthana* we can also compare it with circulatory system of the body and its *Moolasthana* we can compare it with the portal system.

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