



# Sushruta's Concept Of Haemorrhage And Haemostasis And Its Modern Day Relavance In Raktasrava And Rakta Stambhana

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## ABSTRACT

*Ayurveda* is the science of life that is based on the basic concepts of *Dosha, Dhātu and Mala*. *Rasa, Rakta, Mamsa, Meda, Asthi, Majja*, and *Shukra* are the seven *Dhatus* that make up a human constitution. In terms of modern science, *Rakta Dhātu* is comparable to blood. However, the text demonstrates that the concept of *Rakta Dhātu* is far vaster than blood. Doctors frequently encounter haemorrhages in trauma units, operating rooms, and intensive care units. Doctors routinely face haemorrhage, a common medical emergency. Significant intravascular volume loss may trigger a chain of events that leads to hemodynamic instability, decreased tissue perfusion, cellular hypoxia, organ damage and death. *Sushruta Samhita* provides numerous references that demonstrate the effective therapy of emergency and life-threatening conditions, including haemorrhage. In *Ayurveda* the relevance and specificity of the classics of *Acharya Sushruta* listed four fundamental haemostatic techniques *Skandana, Sandhana, Pachana* and *Dahana* which will be evaluated proving the relevance in present era.

**Key Words** – Haemorrhage, *Ayurveda, Sushruta, Dosha, dhatus, mala, Rakta*

## INTRODUCTION

The word “*Rakta*” is derived from Sanskrit word “*Ras Ranjane*” which indicates red color. *Rakta dhatus* have alternatives names such as *Rudhira*, *Asrik*, *Shonit*, *Kshataj*, *Lohit* and *asru*<sup>1</sup>. *Rakta* is a *Matrija Bhava*. *Rakta* contributes to the formation of various organs of *Matrija Bhava*'s like: *Yakrit*, *Pleeha*, *Phuppusa*, *Unduka*, *Antra*, *Guda*, *Basti*, *Jihwa*, *Vrikka* and *Hridaya*.<sup>[2-3]</sup> *Sushruta* explained about *Rakta Dhatu* which is the base of living body. The term ‘*Jivana*’ is commonly used to define the primary function of *Rakta dhatu*, which refers to the manifestation and maintenance of life force. The *Prana Vayu* which circulates with blood, gives all living cells life. *Shonita Kshaya*(decrease) produces roughness of skin, craving or desire for sour and cold things, flabby veins (emptiness of blood vessels).<sup>[4]</sup> If there is loss of *Rakta Dhatu* due to any reason, there will be *Kshaya* of all other *Dhatu* and vitiation of *Vata*<sup>[5]</sup>.

### Importance of Blood

देहस्य रुधिरं मूलं रुधिरेणैव धार्यते | तस्माद्यत्नेन संरक्ष्यं रक्तं जीव इति स्थितिः || [ 14/44]

Blood is essential to life and vitality. Blood is essential for life. As a result, it should be handled with extreme caution. *Vata*, *Pitta*, and *Kapha* are the three pillars that support the body, similar to the structure of a house (*Tristhuna*). Vitiation leads to devastation. *Shonita*, the fourth *dosha*, is present throughout the body's creation, existence, and destruction<sup>[6]</sup>.

A haemorrhage is sudden blood loss produced by a ruptured blood vessel. Minor bleeding can occur when the skin's superficial blood vessels are damaged, causing petechiae<sup>[7]</sup> and ecchymosis<sup>[8]</sup>. It can also be dangerous, causing a variety of symptoms such as changes in vital signs and changed mental status. Internal and external haemorrhage are both possible.

External bleeding may be produced by trauma or a natural orifice. To rule out internal bleeding, high levels of clinical suspicion must be established through a thorough history, physical examination, laboratory tests, imaging, and close monitoring of vital signs. The primary goals of resuscitation are to stop the bleeding and increase the amount of blood in circulation. The present article addresses the evaluation and management of haemorrhage w.r.t *Acharya Sushruta* and highlights its role and efficacy in present day.

### Outcomes of Haemorrhage

धातुक्षयात् सुते रक्ते मन्दः सञ्जायतेऽनलः | पवनश्च परं कोपं याति तस्मात् प्रयत्नतः [ 14/37]

Excessive blood loss can cause defective physiology of bodily tissues, diminished hunger, and disturbed *Vayu* (*Vaat*) due to loss of essential principles and imbalance. *Vata* vitiation diminishes *Rakta Dhatu*, which leads to a drop in red blood cell count. The cold and rough properties of *Vata* limit *Rakta Dhatus* ability to provide warmth and life to the body. This causes physical weakness and weariness.

## Clinical features of Haemorrhage

तदतिप्रवृत्तं शिरोऽभितापमान्ध्यमधिमन्थतिमिरप्रादुर्भावं धातुक्षयमाक्षेपकं दाहं पक्षाघातमेकाङ्गविकारं हिक्कां श्वास  
कासौ पाण्डुरोगं मरणं चापादयति॥ [14/30]

In *Sushruta Samhita Sutra Sthana* chapter 14<sup>th</sup>, *Shonitavarnaniyamadhyayama* (importance of blood & related descriptions), contains explicit references to the clinical characteristics of severe haemorrhage. The majority of the problems associated with severe bleeding were recognized by the ancient *Ayurvedic* experts, and they are comparable to those seen in contemporary medicine. Complications of heavy bleeding include headache, blindness, *Adhimantha* (an eye disease), *Timira* (partial blindness), depletion or loss of tissues, convulsions, paralysis, burning sensation, hemiplegia, hiccup, dyspnoea, cough, anaemia, unconsciousness, dizziness, hearing loss, and death.

## Haemostasis

The body's natural haemostatic mechanism can manage mild to moderate bleeding. It consists of three stages: Vasoconstriction, Platelet plug production, and Blood Coagulation<sup>[9]</sup> Coagulation is the process of blood changing from liquid to gel. It can cause haemostasis, which stops blood loss from a broken vessel and allows for healing.

There are three important phases in blood coagulation.

- 1) When blood vessels rupture or blood is damaged, it triggers a complex chemical reaction involving over a dozen coagulation factors. Activated chemicals produce a compound known as the prothrombin activator.
- 2) The prothrombin activator converts prothrombin to thrombin.
- 3) A clot is created when thrombin converts fibrinogen into fibrin fibres that bind platelets, blood cells, and plasma.<sup>[10]</sup>

*Acharya Sushruta* had explained about the management of **Haemorrhage** in detail which can be described in following way-

**1) Diet** - In case of haemorrhage due to the weak digestive power, food should be light (easily digested), not very cold, which promote blood formation. The food must be taken along with milk and *Yusha* (soup of grains) with excess quantity of ghee or oil. The decoction of *Kakolyadigana* added with sugar and honey should be given to drink in case of haemorrhage.

**2) Blood ingestion** -*Ayurveda* believes in the principle of *Samanya* and *Vishesha*. Therefore, if there is *Raktakashya* or blood loss we must simply replace it with blood. In critical case of haemorrhage, the whole blood of deer, antelope, camel, rabbit, buffalo or boar could be given to drink. It was the original concept of

*Acharya Sushruta* with minimum complications considering the resources available at that time and risk assessment, which later established as blood transfusion.

### 3) *Raktasrava Nirodha Karma* (Methods involved in the management of haemorrhage)

- a) *Skandanam* (thickening or congealing the local blood)
  - b) *Sandhanam* (process by contracting the affected part)
  - c) *Pachanam* (process of digestion in the wound or chemical cauterisation)
  - d) *Dahanam* (process of heat cauterisation)
- a. ***Skandana***- It means clotting or coagulation of blood <sup>[11]</sup> with the help of *Hima Dravya* (ice-cold things). It promotes clotting by the use of Cold drugs or materials. At first this method should be used. Cooling measures such as, applications of ice or cold packs etc, tend to increase blood viscosity and vasoconstriction.
- b. ***Sandhana***- It means uniting <sup>[12]</sup> in this context joining the edges of the wound is called as *Sandhana*. The astringent drugs are used for this purpose. If the bleeding cannot stop by *Skandana Karma*, then this method should be done. Drugs of astringent tastes are possessed of the property of bringing about an adhesion (contraction) of the wound.<sup>[13]</sup> Techniques for tying, bandaging, and suturing have been mentioned and used to halt bleeding; its ties enable skin to be held back in place, which speeds up the onset of haemostasis by platelets. When administered internally, astringent medications may cause mucous membrane or tissue to shrink and are frequently used to control internal bleeding or mucous secretions. For e.g. *Lodhradichurna* and *Saladichurna*.
- c. ***Pachana***- It means ripening or digestive measures <sup>[14]</sup> by using the *Bhasmas* (burned ash powder) to achieve haemostasis. The drugs which adhere the wound by their coagulation effect are used in this method like ash or alkali materials. It might be regarded as a caustic material depending on the preparation because the ashes, which were recovered after distillation, are primarily of an alkaline character. By virtue of its ability to increase blood coagulation, the *Ksharas* on external application can breakdown local tissue protein when applied topically or by dusting. In condition of failure of *Sandhana Karma*, it should be done. Alkalis and alkaline preparations produce liquefactive necrosis by denaturation of proteins and saponification of fats in such a wound or ulcer.
- d. ***Dahana***- It means burning combustion, heat cauterizing and cautery<sup>[15]</sup> This is considered to be superior to above mentioned three procedures, if haemostasis is not achieved *Agnikarma* is the definitive option in controlling the bleeding.<sup>[16]</sup> Applying Direct heat externally can coagulate and constricts the veins. Thus, provide the haemostasis. This is the best method for haemostasis which should be done in case of failure of above three methods. This process is done by electric cautery in modern medical science

## DISCUSSION

The *Skandhana* procedure's mode of action can be described as vasoconstriction, altering viscosity and decreasing metabolic needs. In general, it can be applied to systemic internal haemorrhages, tropical haemorrhages, and capillary haemorrhages. Blood clotting, contraction, wound approximation is helped by the *Sandhana* technique.

Additionally, the medications mentioned in *Vranaropaka* that are intended to stimulate wound healing should be examined from the standpoint of haemostasis because the first step of wound healing involves blood clotting. Similar to this, the *Pachana* technique uses *Bhasma* and *Kshara* to coagulate and breakdown tissue protein, which leads to homeostasis. *Bhasmas* and *Kshara* might be viewed in this perspective as ashes with moderate alkali properties; as a result, they are beneficial in reducing the haemorrhage by chemical cauterisation.

In the last stage, *Dahana* implies coagulation-causing cauterization hence, Haemostasis and tissue protein damage (heat cauterisation) will be accomplished.

## CONCLUSION

If haemorrhage is not treated quickly and effectively, it frequently poses a threat to life. Controlling haemorrhage is therefore extremely important. With the current state of medical knowledge, a number of distinct haemostasis procedures are being developed. The therapies described in the Ancient Indian Sciences, particularly by *Acharya Sushruta*, are simpler and less intrusive, yet they are more effective and carry fewer hazards. When used in isolated areas with few resources, these methods are also incredibly economical. The ancient wisdom in this traditional system of medicine is still not exhaustively explored. Combining knowledge from many conventional medical systems can open up new possibilities for discovering natural drugs. The discovery of plant-based medications is hindered by a lack of understanding of the theoretical doctrines of these systems, in addition to other obstacles.

This overview highlights the history and concepts of Ayurveda. This would assist scholars, researchers, and practitioners obtain a deeper understanding of traditional medicine, strengthen similarities, and eliminate barriers to worldwide acceptance and harmonization.

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